Revitalizing Auto Communities Environmental Response (RACER) Trust

2020 ANNUAL GROUNDWATER MONITORING REPORT

RACER Trust Lansing Industrial Land
Lansing, Michigan

May 6, 2021

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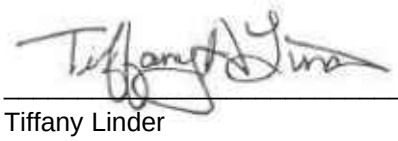

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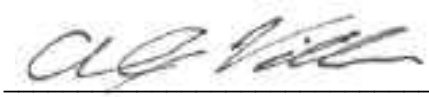

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Acronyms and Abbreviations

Annual Report	2020 Annual Groundwater Monitoring Report
APC Site	former Adam's Plating Company Superfund Site
Arcadis	Arcadis of Michigan, LLC
bgs	below ground surface
COC	constituent of concern
CSM	Conceptual Site Model
DW criteria	Part 201 Residential Drinking Water Criteria
EGLE	Michigan Department of Environment, Great Lakes, and Energy
FSP	Field Sampling Plan
ft/ft	foot per foot
GSI criteria	Groundwater-Surface Water Interface Criteria
IGMP	Revised Interim Groundwater Monitoring Work Plan
LNAPL	light nonaqueous phase liquid
µg/L	microgram per liter
mg/L	milligram per liter
ng/L	nanogram per liter
NTU	nephelometric turbidity unit
PCB	polychlorinated biphenyl
PFAS	per- and polyfluoroalkyl substances
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
QAPP	Quality Assurance Project Plan
QC	quality control
RACER	Revitalizing Auto Communities Environmental Response
RCRA	Resource Conservation and Recovery Act
RL	reporting limit
RRD	Remediation and Redevelopment Act

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

1 Introduction

On behalf of the Revitalizing Auto Communities Environmental Response (RACER) Trust, Arcadis of Michigan, LLC (Arcadis) prepared this 2020 Annual Groundwater Monitoring Report (Annual Report) to support the Resource Conservation and Recovery Act (RCRA) corrective action process for RACER Trust Lansing Industrial Land, located in Lansing, Michigan (Site). The Site consists of former Plants 2, 3 and 6. This Annual Report summarizes groundwater monitoring completed between January and December 2020, consistent with the requirements of the Revised Interim Groundwater Monitoring Work Plan (IGMP; Arcadis 2019a), which was approved by the Michigan Department of Environment, Great Lakes and Energy (EGLE) on July 25, 2019.

The following sampling events were completed in accordance with the IGMP (Arcadis 2017a) or 2019 Revised IGMP (Arcadis 2019a):

- *First quarter 2020*. A quarterly event completed in March 2020.
- *Second quarter 2020*. An annual event completed in June 2020.
- *Third quarter 2020*. A quarterly event completed in August 2020.
- *Fourth quarter 2020*. A semi-annual event completed in December 2020.

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

- Objective and scope of the sampling events
- Summary of groundwater elevations and light nonaqueous phase liquid (LNAPL) gauging data, including contour maps and trend plots
- Summary of LNAPL recovery completed in accordance with the 2015 LNAPL Removal Work Plan (Arcadis 2015b)
- Figures, tables, and a brief narrative summarizing the groundwater sampling results
- Groundwater elevation contour maps for various water bearing zones
- Updated groundwater plume stability evaluation
- Summary of Lansing Township water supply well sampling
- Conclusions and recommendations for revisions to the IGMP as appropriate.

2 Sampling Methods

This section discusses the sampling methodology used at the Site. The Field Sampling Plan (FSP; Arcadis 2011a) for the Site provides detailed methodology regarding the collection of groundwater samples and includes appropriate Arcadis standard operating procedures (SOPs).

2.1 Groundwater Monitoring Methods

During the second quarter 2020 annual sampling event, and before sample collection, site-wide gauging was completed using electronic water level meters. LNAPL wells were gauged using an oil/water interface probe. During the first, third, and fourth quarter 2020 sampling events, gauging was limited to those wells selected for sampling and LNAPL monitoring. All gauging was completed within 24 hours with few exceptions due to access or other issues. Groundwater samples were collected in a manner consistent with the low-flow sampling techniques outlined in the FSP and the SOP for low-flow sample collection (Arcadis 2011a), and generally consistent with EGLE's Remediation and Redevelopment Division (RRD) Op Memo 2, Attachment 5 (EGLE 2004). An emphasis was placed on collecting low-turbidity samples (less than 10 nephelometric turbidity units [NTUs]) for metals analysis.

The most current sampling matrix provided as part of the 2019 Revised IGMP (Arcadis 2019a) is included as **Table 1**. In general, groundwater samples were submitted for analysis for one or more of the following:

- 1,4-Dioxane by United States Environmental Protection Agency (USEPA) Method 8260B SIM
- 1,4-Dioxane by USEPA Drinking Water Method 522, which provides a reporting limit (RL) of 0.20 microgram per liter (µg/L). (i.e., Lansing Township municipal wells, and select bedrock monitoring wells)
- Volatile organic compounds (VOCs) by USEPA Method 8260B
- Selected metals (arsenic, total chromium, copper, lead, nickel, and vanadium) by USEPA Method 6020, and, at discrete locations, metals associated with known impacts (e.g., hexavalent chromium in Area 14 at Plant 3).
- Per- and polyfluoroalkyl substances (PFAS) using USEPA Method 537 modified with isotope dilution (DoD QSM 5.1).

2.1.1 Quality Control/Quality Assurance

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

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

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

2.1.2 Light Nonaqueous Phase Liquid Monitoring

LNAPL monitoring wells were gauged during the second, and fourth quarter events with an oil/water interface probe. Gauging methods were consistent with the 2019 Revised Interim Groundwater Monitoring Work Plan (Arcadis 2019a)

2.2 Groundwater Elevation Monitoring

Monitoring wells were gauged during sampling using an electronic water level meter generally within a 24-hour period. To evaluate seasonality, site-wide gauging is rotated annually between the second quarter and fourth quarter events. In 2020, site-wide gauging was completed during the fourth quarter annual sampling event. During the first, second and third quarter sampling events, gauging was limited to those wells selected for sampling. Gauging methods were consistent with the FSP (Arcadis 2011a) and IGMP (Arcadis 2019a).

3 Results

This section summarizes the sampling activities completed between January and December 2020. **Table 2** presents groundwater analytical data collected during the reporting period. As a frame of reference, figures showing exceedances of Part 201 residential drinking water criteria (DW criteria) are provided as **Figures 2** through **9**. **Appendices B** and **C** provide the validated laboratory analytical reports and low-flow groundwater sampling field logs, respectively.

3.1 Groundwater Monitoring Results

Groundwater analytical results are summarized on Table 2 with exceedances of DW criteria highlighted in gray and summarized on **Figures 2** through **9**. Results of the 2020 groundwater monitoring events are summarized below.

- **1,4-Dioxane:** 1,4-Dioxane results (**Figure 2** and **3**) are generally consistent with the results summarized in the 2019 Annual Groundwater Monitoring Report (Arcadis 2020a) and 2020 Semi Annual Groundwater Monitoring Report (Arcadis 2020b). Note that for the lower 1,4-dioxane plume, a biosparge remedy has been implemented per the Interim Measures Work Plan: Lower 1,4-Dioxane Biosparge work plan (Arcadis 2018). The Plant 3 biosparge system began operating in May of 2019, and the Plant 2 biosparge system began operating on August of 2020. A summary of the biosparge system performance monitoring results through December 2020, is included in the Lower 1,4-Dioxane Biosparge Update Report (Arcadis 2021a), submitted to EGLE on March 18, 2021. Performance monitoring demonstrates treatment of the lower 1,4-dioxane plume within the radius of influence of the biosparge wells on Plants 2 and 3, as well as downgradient treatment on Plant 3. Currently the Plant 2 biosparge system has not been in operation long enough to show evidence of treatment in downgradient wells. Performance reporting will continue on a quarterly basis.
    - In 2018, detections of 1,4-dioxane in monitoring wells MW-16-74, MW-16-75, and MW-16-77, at the toe of the lower 1,4-dioxane plume suggested additional migration of the plume to the east-southeast (Arcadis 2019b). During 2019 and 2020, 1,4-dioxane concentrations in MW-16-74 and MW-16-75 fluctuated between non-detect and 3 micrograms per liter (µg/L) and were not detected in MW-16-77 suggesting no additional migration. Future migration to the southeast is not expected due to the operation of the biosparge system and geologic conditions described as part of the Lower 1,4-Dioxane Conceptual Site Model (Arcadis 2021b).
    - Lower 1,4-dioxane performance monitoring wells located within the area of influence of the biosparge system (e.g., MW-20-128, MW-14-61, MW-19-121, MW-19-123, MW-13-43, TW-14-06) have shown decreasing concentrations since system startup.

- Increasing concentrations were observed within the northeast lobe of the lower 1,4-dioxane plume on Plant 2 during 2019. The following observations of northeast lobe 1,4-dioxane concentrations were made during 2020 monitoring:
  - MW-17-86: 1,4-Dioxane concentrations have increased from 44 to 90 µg/L from 2018 to 2019 and increased from 99 to 106 µg/L during 2020 monitoring. These concentrations are expected to decrease with continued operation of the biosparge system.
  - Other weathered bedrock monitoring wells located near the northeast lobe including MW-14-61, MW-16-84, and MW-16-85, contain 1,4-dioxane concentrations generally consistent with previous results.
- Monitoring wells located near the western Plant 2 property boundary including MW-14-58 in the perched zone, and MW-14-56, MW-15-73, and MW-16-80 in weathered bedrock, show concentrations of 1,4-dioxane exceeding the DW criterion of 7.2 µg/L in 2020. The detected concentrations are generally consistent with previous results observed at these locations. As previously reported, detections of 1,4-dioxane at these locations could be associated, wholly or in part, with the former Adams Plating Company Site (APC Site). Possible commingling of impacts from the APC site confounds further delineation to the west.

- **VOCs:** VOCs exceeding DW Criteria in at least one monitoring well during 2020 include vinyl chloride, as well as sporadic exceedances of benzene, ethylbenzene, isopropyl benzene, n-propylbenzene, naphthalene, xylenes, 1,1-dichloroethane, and 1,2,4-trimethylbenzene. VOC exceedances are shown on **Figure 4**. This is consistent with previous groundwater investigation and monitoring results.
  - Multiple VOC exceedances at MW-14-54 near the former waste storage area on Plant 2, delineated to the west by MW-14-55 and MW-12-18.
  - Sporadic detections in the central part of Plants 2 and 6 in perched groundwater (MW-14-59, MW-14-60, MW-02-06(6)).
  - Plant 6 entrance off of Stanley and Osborn Streets - Details regarding the detection of vinyl chloride in shallow groundwater in this area was provided to EGLE as part of the *Plant 2, 3 and Plant 6 Vapor Intrusion Summary* (Arcadis 2021c). Vinyl chloride has been detected at on-site at monitoring well MW-20-131 and off-site at MW-20-132 at concentrations above the Site-Specific Vapor Intrusion to Indoor Air Criteria. These wells will continue to be monitored through 2021 along with an off-site soil vapor monitoring point (SVMP-20-01).
  - VOCs are primarily limited to the perched zone; however, detections of VOCs have been observed in weathered bedrock at Plant 2 at concentrations below DW Criteria:
    - *MW-14-61:* contained chloroethane at a concentration of 17 µg/L during June 2020. Chloroethane was not detected during the December 2020 sampling event.
    - *MW-17-86:* contained chloroethane at a concentration of 19 µg/L during June 2020 and 12 µg/L during December 2020, less than the DW criterion of 430 µg/L.

  VOCs will continue to be monitored in the weathered bedrock zone, including additional sampling and analysis of VOCs, as appropriate. Suggested changes to the IGMP are included in Section 5.1.

- **Metals:** Metals exceeding DW Criteria in at least one monitoring well during 2020 include arsenic, nickel, hexavalent chromium, and vanadium (**Figure 5**). The metals results are consistent with previous sampling events.
  - *MW-13-32:* Total nickel was detected in this shallow monitoring well, located in the southeastern corner of Plant 3 within Area 16, at a concentration of 0.185 milligrams per liter (mg/L; DW criterion: 0.10 mg/L) during the second quarter of 2020. Groundwater elevation in this area has indicated that perched groundwater flow is westerly, onto the Site. A summary of the nickel occurrence at Plant 3 was provided to EGLE for both soil and groundwater (Arcadis 2014b, 2015c, 2015d).
  - *MW-13-36R:* Vanadium was detected in this shallow well located near the eastern boundary of Plant 6, at a concentration of 0.005 mg/L, exceeding the DW criteria of 0.0045 mg/L. This result is consistent with previous analytical results for MW-13-36R. An evaluation of metals stability in groundwater (Arcadis 2014) and subsequent monitoring indicates that metals at the Site are stable and are spatially limited.
  - *MWBP-10-UST5-6:* Arsenic was detected in the perched zone located near the southern boundary of Plant 6, at a concentration of 0.012 mg/L, exceeding the DW criteria of 0.005 mg/L. MWBP-10-UST5-6 is screened in a confined sand unit at approximately 30 feet bgs, which is also screened by several other monitoring wells nearby including MW-12-16 off-site. Groundwater elevations for these wells consistently suggest a northerly flow, onto the Site, since 2014. Based on the hydraulic isolation of this well and the apparent northerly groundwater flow direction, EGLE has agreed that arsenic at this location is related to regional background conditions and not associated with Site impacts.
  - *MWBP-11-UST1-4 & MWBP-12-UST1-4:* Similarly, arsenic was detected in the perched zone located near the southern boundary of Plant 6, at a concentration of 0.012 and 0.010 mg/L at these wells, slightly above DW Criteria. These detections are consistent with background concentrations and/or may be associated with residual reducing conditions associated with the former UST located in this area.
- Perfluorooctanesulfonic Acid (PFOS): concentrations exceeded the DW Criteria of 16 ng/L at 13 perched monitoring well locations (CH-14-RO, MW-12-12, MW-13-36R, MW-14-62, MW-18-88, MW-18-89, MW-18-90, MW-18-91, MW-18-95, MW-18-98, MW-18-99, P6-SB-07, UNK-15) in 2020 (**Figure 6**). The PFOS results are generally consistent with previous results (Arcadis 2018a, 2018b, 2019d, 2019e, 2020b).
  - *MW-18-88 and MW-18-95:* Perched monitoring wells located along the eastern boundary of Plant 3, contained PFOS concentrations higher than the DW Criteria. PFOS did not exceed the DW Criteria at the six perched monitoring wells installed as sentinels in the City of Lansing's Dunnebacke and Westside Parks.
  - *MW-12-12 and MW-13-36R:* Located along the eastern boundary of Plant 6, contained concentrations of PFOS that exceed the DW criteria. PFOS did not exceed DW Criteria at the vertical aquifer profiling (VAP) samples completed to delineate PFAS impacts east of Plant 6. A summary of the off-site VAP investigation is included as part of the Plant 6 PFAS Investigation Summary – Phase 2 (Arcadis 2019c).
  - In addition to DW Criteria exceedances, PFOS exceeds the GSI Criteria of 12 ng/L at 14 perched monitoring wells during the 2020 groundwater monitoring events (**Figure 6**). Monitoring well MW-18-105, located east of Plant 3, contained 12.4 ng/L of PFOS during March 2021; however, concentrations of PFOS detected during June, August, and December 2021 were below the GSI criterion of 12 ng/L. These results are consistent with concentrations detected during 2019 monitoring. Off-site PFOS exceedances will continue to be monitored to evaluate concentration trends and plume stability.

- **PFOA:** concentrations exceeded the DW Criteria of 8 ng/L at 17 perched monitoring well locations (CH-14-RO, MW-04-05(6), MW-12-12, MW-13-36R, MW-14-59, MW-14-60, MW-14-62, MW-14-67, MW-14-70, MW-18-88, MW-18-89, MW-18-90, MW-18-91, MW-18-98, MW-18-99, P6-SB-07, UNK-15) in 2020 (**Figure 7**). The PFOA results are generally consistent with previous results (Arcadis 2018a, 2018b, 2019d, 2019e, 2020b).
  - *MW-18-88:* A perched monitoring well located along the eastern boundary of Plant 3, contained a PFOS concentration of 8.8 ng/L in a sample collected during the third quarter 2020 sampling event, exceeding the DW Criterion of 8 ng/L. PFOA was detected at concentrations below the DW criterion during the first, second, and fourth quarter 2020 sampling events. Additionally, PFOA has not exceeded the DW Criteria at any of the six perched monitoring wells installed as sentinels in the City of Lansing's Dunnebacke and Westside Parks.
  - *MW-04-05(6), MW-12-12, MW-13-36R, and MW-14-67:* Perched monitoring wells located along the eastern boundary of Plant 6, contained concentrations of PFOA that exceed the DW criteria of 8.0 ng/L. Additional monitoring wells were installed along the eastern and southern Plant 6 boundaries during first quarter 2021 to further evaluate perimeter exceedances. These wells will be incorporated into the IGMP and 2021 sampling (Section 5.1). A report summarizing installation and initial sampling results is being prepared and will be submitted to EGLE in 2021. Further, additional work will be completed in summer 2021 off-site to the east of Plant 6 to confirm the extent of PFOA in perched groundwater.
- **Other PFAS:** In general, other PFAS concentrations appear to correlate to PFOS and PFOA concentrations and decrease with distance from PFOS and PFOA source areas. Two other PFAS compounds, perfluorononanoic acid (PFNA) and perfluorohexanesulfonic acid (PFHxS), exceed DW criteria at one or more locations. Specific results for other PFAS are summarized on **Table 2**.
  - PFNA concentrations exceeding the DW criterion of 6 ng/L were detected in 4 perched monitoring wells (**Figure 8**) (MW-12-12, MW-13-36R, MW-14-62, and P6-SB-07).
  - PFHxS concentrations exceeding the DW criterion of 51 ng/L were detected in perched monitoring well CH-14-RO (located in the Plant 3 PFAS source area) and in MW-18-103, a perched monitoring well located along the northern boundary of Dunneback Park east of Plant 3. In MW-18-103 PFHxS was detected at concentrations ranging from 16.8 ng/L to 38 ng/L during the first three quarters of 2020, below the DW criterion of 51 ng/L. A PFHxS concentration of 61.8 ng/L detected in December 2020 exceeded the DW criterion. The PFHxS detected at MW-18-103 appears to be isolated and may be related to an off-site source area.

3.1.1 Municipal Well and Bedrock Monitoring Well Sampling Results

The results of the Lansing Township well sampling indicate 1,4-dioxane concentrations of 0.22 µg/L in Lansing Township well TWP-90-04, and 0.41 µg/L TWP-90-05 (**Appendix A**). These concentrations are consistent with those detected in December 2019 (0.23 ng/L and 0.41 ng/L). The locations of the municipal wells and the bedrock 1,4-dioxane results are summarized on **Figure 9**. TWP-90-03 was out of service during December 2020 and could not be sampled.

Analytical results for the municipal wells are included in **Table 2**. Widespread 1,4-dioxane detections are potentially related to a 1,4-dioxane "background condition" in and around Lansing, as demonstrated by the low-level 1,4-dioxane sampling completed at the Site in 2017. Sporadic detections of 1,4-dioxane in the bedrock

monitoring wells installed along the core of the plume ranged from 0.16 µg/L to 0.98 µg/L and did not exceed DW Criteria in 2020. Annual sampling of Lansing Township wells will continue to monitor for 1,4-dioxane.

3.2 Light Nonaqueous Phase Liquid Monitoring

LNAPL is present in the central portion of Plant 2 (Area 5-2) and in the north-central portion of Plant 3 (Area 17). LNAPL monitoring well locations and approximate extent of LNAPL are presented on figures provided in **Appendix D**. Trend plots indicate that, in general, LNAPL (when present) thickness gradually increases until it reaches equilibrium within the well and then stabilizes. For the deeper LNAPL, the wells take longer to equilibrate with the confined LNAPL conditions relative to the static water level within the formation. The comprehensive *Plant 2 LNAPL Conceptual Site Model* was provided to EGLE for review on February 20, 2020 (Arcadis 2020c). Based on the monitoring results, there is no indication of LNAPL migration. **Table 3** summarizes measured LNAPL thickness, and **Appendix D** includes LNAPL trend plots.

3.3 Groundwater Elevation Monitoring

In 2020, a site-wide groundwater elevation survey was completed during the annual event (June 2020). Additional groundwater elevation measurements were collected at sampled wells during the semi-annual and quarterly events. **Table 4** summarizes groundwater elevation measurements collected at the Site. Groundwater elevation trend graphs for key wells at each plant are provided in **Appendix E**. Trends within each water-bearing zone are discussed below.

3.3.1 Perched Zone

Due to the predominance of clay-rich sediment, the perched zone is interbedded and has an overall low permeability and is characterized by isolated sand zones within layers of silt and clay. The potentiometric surface measured within the perched zones is presented on **Figure 10** (Plants 2 and 6) and **Figure 11** (Plant 3). Both figures include potentiometric surface contours for all wells less than 25 feet deep. The lower conductivity clay and silt that dominate this zone result in high horizontal and vertical gradients. Sand zones are discontinuous and often do not correlate from well to well, and minor variations in well screen elevation have a significant impact on the potentiometric surface. Therefore, although the contour maps represent the overall shallow potentiometric surface, they are of limited use to determine groundwater flow direction.

The trend graphs included in **Appendix E** indicate that potentiometric surface elevations in the perched zone have been stable to increasing during the period of monitoring beginning in 2012. Storm sewer modifications were completed at Plant 3 during November 2018 and at Plant 2 in 2019 and 2020. Comparison of potentiometric surface elevations observed on Plant 3 prior to storm sewer modifications and post-modification potentiometric surface elevations generally show minor fluctuations (both increasing and decreasing) that are within the range of seasonal variation. Perched potentiometric surface elevations on Plant 2 generally show a slight increase in groundwater elevation following the 2019 modifications, however perched groundwater elevations on Plant 2 have generally shown a gradual increasing trend since 2012. It is unclear whether the small changes in groundwater elevation on Plant 2 are influences by storm sewer modifications, or part of longer-term trends related to decommissioning of the plants. Evaluation of perched groundwater elevations will continue during 2021 to evaluate the effect of storm sewer bulkheading.

3.3.2 Deep Overburden

Saturated deep overburden is present only at Plant 3. Groundwater present within the deep overburden is hydraulically connected to the weathered bedrock and bedrock zones. **Figure 12** presents potentiometric surface elevation contours for deep overburden wells located on Plant 3. In the northern portion of Plant 3, the apparent groundwater gradient is northwesterly. In the southwestern portion of Plant 3, a groundwater high is apparent beneath the former coliseum area with groundwater flow to the southeast, consistent with the lower 1,4-dioxane distribution.

The trend graphs included in **Appendix E** show that steady increases in water levels were observed in deep overburden water levels beginning in 2016 likely related to increased precipitation, as well as long-term changes in municipal pumping.

3.3.3 Weathered Bedrock and Bedrock

The long-term trends for bedrock monitoring wells show an increasing potentiometric surface in bedrock and weathered bedrock beginning primarily in 2016. Potentiometric surface trend graphs for select bedrock and weathered bedrock wells are included in **Appendix E**. The increase in potentiometric surface of the bedrock wells was accompanied by a general decrease in the vertical gradient within the Saginaw formation (from 0.44 foot per foot (ft/ft) downward in 2016 to 0.13 ft/ft downward in 2018, 0.28 ft/ft downward in 2019, and 0.33 ft/ft downward in 2020). The effect, as documented in the December 5, 2019 Update Meeting Presentation provided to EGLE, is an overall flatter, more variable bedrock horizontal gradient with a west to east flow component observed in the central part of Plant 2. The rise in potentiometric surface, and overall increasing trend observed since 2016, is likely attributed to changes in municipal pumping patterns, both long-term and seasonally.

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

For the bedrock (and by extension, the weathered bedrock), the effective head or “corrected” potentiometric surface elevation can be calculated based on the observed vertical gradients. As indicated in **Table 5**, the vertical gradient tends to be limited near the coliseum and increases to the south to 0.36 ft/ft downward at wells MW-15-72/MW-12-05R (located in central Plant 2) before stabilizing to 0.37 ft/ft downward at wells MW-13-52/MW-13-50 (located on western Plant 6). This variation in vertical gradient appears to coincide with the transition between bedrock formations. Near the coliseum, where the bedrock encountered consists of the more uniform and permeable Grand River Formation, the vertical gradient is negligible. To the south, within the interbedded sandstone and shale of the Saginaw Formation, there is a significant vertical gradient due to the vertical anisotropy created by the interbedded shale and sandstone of the Saginaw Formation. Review of the bedrock wells and other deep boring logs suggests an approximate geologic contact between the Grand River and Saginaw Formations oriented roughly southwest to northeast. **Figure 13** includes the interpreted location of the geologic contact.

To calculate the effective head for the bedrock (**Figure 13**), an average downward gradient 0.33 ft/ft was applied to bedrock monitoring wells installed within the Saginaw Formation as follows:

GWeff = GW – (dh/dl* ΔElev)

Where:

GWeff = effective groundwater elevation

GW = measured groundwater elevation

dh/dl = vertical gradient

ΔElev = change in elevation between deepest well and measured well

As shown on **Figure 11**, the corrected bedrock groundwater contours are a good match for the distribution of the lower 1,4-dioxane plume located within the weathered bedrock zone. The corrected potentiometric surface shows an easterly component of flow within the bedrock/weathered bedrock beneath the Plant 2 LNAPL area, an observation supported by the easterly migration of the lower 1,4-dioxane plume.

4 Groundwater Plume Stability

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

The plume stability assessment has been updated annually and incorporated into the annual reports. Stability assessments have been generally consistent and demonstrate that increasing trends are primarily limited to 1,4-dioxane in weathered bedrock wells and non-site-related metals in perched wells mobilized by changes in groundwater geochemistry associated with the Site. The plume stability assessment presented in this section represents an updated analysis of time-series concentration trends using data collected through fourth quarter 2020.

The updated statistical analysis of dissolved-phase COC concentrations with time was completed using the Mann-Kendall slope trend test, consistent with the methodology used in previous evaluations. The updated analysis for 2020 includes all wells that that meet the following criteria:

- At least four sampling events have been completed.
- At least 65 percent of the sampling results were greater than detection limits (minimum of three sampling results greater than detection limits).
- At least one detection in the dataset exceeded the lowest relevant criteria.

The plume stability assessment was completed in accordance with USEPA guidance (USEPA 2009). Correlations were accepted as significant for p-values less than or equal to the alpha value, 0.10 (with a confidence level of 90

percent). Additional information regarding the Mann-Kendall analysis and methods is provided in the 2014 Preliminary Groundwater Geochemical and Plume Stability Assessment (Arcadis 2014b) and in **Appendix F**.

The Mann-Kendall trend test is a non-parametric test to evaluate if a statistically significant unidirectional (consistently increasing or decreasing) trend was observed during the monitoring period. Guidance for conducting the Mann-Kendall test have been provided in Section 17.3.2 of the US EPA guidance document (USEPA 2009). **Table 6** presents a comprehensive summary Mann-Kendall trend analysis results. The overall trend results are shown on **Figures 14** and **15** for perched and weathered bedrock zones, respectively. **Appendix F** presents plots of concentrations through time for all well/COC pairs that met criteria for statistical trend analysis.

4.1 Perched Zone

4.1.1 1,4-Dioxane

The 1,4-dioxane plume generally appears to be stable to decreasing within the perched zone as demonstrated with 2014 plume stability evaluation and each successive annual report (Arcadis 2014b, 2015d, 2016a, 2017b, 2018c, 2019b, 2020b). Plant 2 perched monitoring well MW-14-58 shows a statistically increasing trend, however, 1,4-dioxane concentrations in MW-14-58 have fluctuated significantly within the range of 12 µg/L to 78 µg/L since 2014 and have been decreasing since 2019.

4.1.2 Volatile Organic Compounds

Concentrations of VOCs in the perched zone are sporadic, and a large plume footprint has not been observed; rather, VOC concentrations in groundwater greater than DW criteria are limited to discrete source areas (e.g., Area 2, Area 9) and areas immediately surrounding observed LNAPL at Plants 2 and 3. Review of VOC data indicates increasing trends at 3 locations:

- *MW-14-54:* A monitoring well located in Area 2 of Plant 2 exhibits increasing trends for ethylbenzene, isopropyl benzene, and total xylenes. Perched monitoring wells MW-12-18 and MW-14-55 located between MW-14-54 and the western property boundary have not had detectable VOCs, suggesting that the extent of groundwater impacts in Area 2 is spatially limited.
- *MW-14-60:* A monitoring well located near the Plant 2 LNAPL demonstrates an increasing trend for vinyl chloride, however concentrations decreased from 12 µg/L during June 2019, to 5 µg/L during 2020.
- *MWBP-12-UST1-4:* An increasing benzene trend was identified in MWBP-12-UST1-4, located near the southern property boundary of Plant 6. Benzene concentrations in MWBP-12-UST1-4, installed at a depth of 15-25 feet, steadily increased from 2013 to June 2015, with a maximum concentration of 157 µg/L. Benzene concentrations were sporadic from 2016 through 2018 and had decreased to 6 µg/L in December 2018 followed by a concentration increase to 284 µg/L during June 2019. During 2020 benzene was not detected in MWBP-12-UST1-4. Monitoring well MWBP-12A-UST1-4 located between MWBP-12-UST1-4 and the property boundary at a depth of 28-38 feet, has also been non-detect for benzene during recent sampling events. Monitoring of MWBP-12-UST1-4 and MWBP-12A-UST1-4 will continue semi-annually.

4.1.3 Metals

During previous plume stability assessments, most statistical analyses for concentrations of metals in perched zone monitoring wells were determined to be decreasing or exhibit no trend, suggesting overall stability in metals impacts greater than criteria. The trend evaluation for metals focused on monitoring wells near the Site boundary to evaluate the potential for off-site metal impacts. The following increasing trends were observed, with remaining monitoring wells at the Site boundary exhibiting stable to decreasing concentrations of metals:

- Arsenic in MWBP-10-UST5-6, located along the southern Plant 6 boundary, was detected at a concentration of 0.012 mg/L in both June 2019 and June 2020. Arsenic concentrations at this location are within the range of state-wide background concentrations (Cummings 1989), and water levels measured at wells within the same sand unit at Area 9 show a consistent gradient to the north (flow onto the Site), suggesting that arsenic detected in MW-12-16 is not site-related. As agreed with EGLE, additional evaluation beyond continued monitoring is not required for the area.

4.1.4 PFOS, PFOA, PFNA, and PFHxS

Twenty-four monitoring wells met the criteria for Mann-Kendall analysis for PFOS, PFOA, PFNA, or PFHxS during 2020. Statistical trend analysis indicates that, apart from one well (MW-13-36R), all wells with PFAS concentrations exceeding criteria demonstrate stable to decreasing trends. The increasing trend observed at MW13-36R for PFOA is located near the eastern boundary of Plant 6. Additional delineation of PFOA east of Plant 6 will be completed during the summer of 2021.

4.2 Deep Overburden and Weathered Bedrock

4.2.1 1,4-Dioxane

Since the initial plume stability assessment in 2014, concentrations within the lower 1,4-dioxane plume have generally shifted toward decreasing to stable trends in the northern portion of the plume on Plant 3, and stable to increasing trends towards the toe of the plume and the Plant 2 LNAPL area. Nine weathered bedrock and deep overburden wells exhibited increasing trends for 1,4-dioxane on Plants 2 and 3 (MW-13-34, MW-13-45, MW-14-56, MW-14-61, MW-15-73, MW-16-81, MW-16-84, MW-16-85, and MW-17-86). Notable trends within the lower 1,4-dioxane plume include the following:

- *MW-13-34 and MW-13-48:* Nested at the Plant 3 southern property boundary and installed within the weathered bedrock and deep overburden, respectively. MW-13-34 exhibits an increasing trend for 1,4-dioxane and has been observed to be increasing since initial sampling in 2013 (from approximately 20 µg/L to 100 µg/L). MW-13-48 previously exhibited an increasing trend (Arcadis 2019b); however, concentrations in MW-13-48 have been decreasing since 2015 (from a max of approximately 380 µg/L to 150 µg/L) and no longer shows an increasing trend.
- *MW-15-73 and MW-13-45:* Located within the weathered bedrock at the west and east extents of the lower 1,4-dioxane plume in the central part of Plant 2. Together with monitoring well MW-13-43 (plume axis), they comprise a transect across the plume. MW-15-73 has shown consistent detections of 1,4-dioxane, with only the three most recent samples (December 2018, June 2019, and June 2020) exceeding the DW criterion of 7.2 µg/L. This increasing trend could be attributed to contributions from the APC Site. Work completed during

the installation of MW-15-73 and installation of the Biosparge system (Arcadis 2021b) has shown a clean zone between the lower 1,4-dioxane plume and MW-15-73. Concentrations in MW-13-45 initially increased between 2013 and 2015 but appear to be stable since 2016 ranging from approximately 40 to 60 µg/L.

- *MW-14-56:* A weathered bedrock well located along the western property boundary of Plant 2, shows an increasing trend (6 to 14 µg/L) for 1,4-dioxane and may also be related to the APC Site located upgradient of the well location.
- *MW-16-81:* Located immediately south of the Plant 2 LNAPL area,1,4-dioxane has been steadily increasing from initial sampling in 2016 to June 2020. The increasing trend suggests leakage from the perched zone. 1,4- Dioxane concentrations in MW-16-81 decreased from 3,100 µg/L during June 2020 to 590 µg/L during September 2020 before rebounding to 1,930 µg/L during December 2020. The recent fluctuations in concentration may be related to the startup of the biosparge system in August 2020, as well as natural variability.
- *MW-16-85 and MW-17-86:* Additional weathered bedrock sentinel wells installed in 2016 and 2017 to monitor the northeast lobe of the lower 1,4-dioxane plume. Well MW-17-86 has shown increasing concentrations since installation in 2017 (from approximately 8 µg/L in 2017 to 110 µg/L in 2020). Well MW-16-85 exceeded DW Criteria for the first time in 2019 (16-17 µg/L); however, 1,4-dioxane concentrations have since decreased to 8 µg/L in June and December 2020. These wells are expected to decrease in concentration with continued operation of the biosparge system.

5 Conclusions

This Annual Report summarizes the groundwater monitoring activities completed between January and December 2020, consistent with the 2019 Revised IGMP (Arcadis 2019a). Based on the results of the sampling and review of the plume stability evaluation, the following conclusions are offered:

- *VOC and Metals:* Groundwater sample results indicate that concentrations of several VOCs and metals exceed residential drinking water criteria during at least one sampling event at the Site. Elevated concentrations of metals are, in most cases, a result of natural geochemical conditions and/or slight shifts in geochemistry associated with the presence of VOCs. The exception is nickel on the eastern boundary of Plant 3, which is attributed to off-site conditions.
- *1,4-Dioxane:* Installation of the biosparge system for the lower 1,4-dioxane plume has been completed per the Interim Measures Work Plan: Lower 1,4-Dioxane Biosparge work plan (Arcadis 2018d). The Plant 3 biosparge system began operating in May of 2019, and the Plant 2 biosparge system began operating on August of 2020. Monitoring wells installed within the radius of influence of the biosparge system have shown decreasing concentrations. Performance monitoring and system construction details for the biosparge system will be submitted under separate cover.
    - 1,4-Dioxane concentrations in the perched zone and weathered bedrock along the western Plant 2 property boundary exceed Part 201 criteria at several locations similar to previous years and are likely wholly associated or commingled with impacts associated with the former APC Site.
    - Wells in the northern portion of the lower 1,4-dioxane plume demonstrate stable to decreasing concentrations. Concentrations in the southern portion of the lower 1,4-dioxane plume are stable to increasing trends, particularly to the east of the Plant 2 LNAPL Area within the northeast lobe. Increasing

weathered bedrock concentrations of 1,4-dioxane in wells near the property boundary (MW-15-73 and MW-14-56) may be due to contributions from the former APC Site.

- *1,4-Dioxane in Bedrock:* Sporadic detections of 1,4-dioxane in deeper bedrock monitoring wells installed along the core of the plume ranged from 0.16 µg/L to 0.98 µg/L and did not exceed drinking water criteria in 2020.
  - Lansing Township wells TWP-90-04 and TWP-90-05 were sampled in December 2020 and analyzed for 1,4-dioxane using USEPA Method 522 for drinking water. Concentrations of 0.23 and 0.41 µg/L, respectively, were reported and are consistent with previous sampling results. The low-level detections of 1,4-dioxane in the region may result from several regional and/or numerous nonpoint sources. Annual sampling of Lansing Township wells will continue in 2021.
- *PFAS Compounds:* PFOS, PFOA, PFNA, and PFHxS concentrations exceeded DW Criteria and PFOS exceeded the GSI criterion in perched monitoring wells during 2020 groundwater monitoring events. Concentrations PFAS in perched groundwater at Plants 2, 3, and 6, are stable or show no significant trend with the exception of one well at the perimeter of Plant 6. Additional work will be completed in 2021 to delineate PFAS off-site to the east of Plant 6.
- *Groundwater potentiometric surface maps:* Contour maps for the three saturated zones at the Site show a complex hydrogeologic system. The potentiometric surface in the perched zone has been stable to increasing in elevation since monitoring began in 2011. Potentiometric levels within the lower zones (deep overburden, weathered bedrock, and bedrock) have been increasing since 2016, potentially related to climate variables but more likely related to changes in municipal pumping.
- *Plants 2 and 3 perched groundwater elevations:* Comparison of pre-bulkheading groundwater elevations to groundwater elevations observed during 2020 shows minor fluctuations that are within the range of seasonal variation. Perched groundwater on Plant 3 appears to exhibit radial flow away from the former press pits in Area 14.
- *Light nonaqueous phase liquid (LNAPL):* Consistent with previous annual reports, there is no indication of LNAPL migration.

Based on these conclusions, no immediate action is recommended at this time. Results of the monitoring program do not suggest changes are required for the previously submitted Plant 2 LNAPL CSM (Arcadis 2020c), or the lower 1,4-dioxane CSM (Arcadis 2021b). Further, there are no apparent risks of exposure noted for the surrounding residential neighborhoods. Groundwater monitoring will continue consistent with the 2019 revised IGMP, with several suggested modifications, as outlined below.

6 Proposed IGMP Modifications

As outlined in the *Plant 6 PFAS Investigation Summary report – Phase 2* (Arcadis 2019c), three perched monitoring wells were installed near the eastern property boundary (MW-21-133, MW-21-134, and MW-21-135), and three perched monitoring wells were installed in the southern ROW of Michigan Avenue to the south of Plant 6 (MW-21-136, MW-21-137, and MW-21-138). The new perched monitoring wells were installed and sampled during March 2021 to evaluate potential off-site migration of PFAS. Installation details and initial results for the new monitoring wells will be submitted to EGLE under separate cover, along with a workplan for further off-site investigation of PFAS at Plant 6. The new monitoring wells will be integrated into the IGMP for quarterly PFAS sampling during 2021, with sampling frequency re-evaluated for 2022.

In December 2020, abandonment of eleven perched and one weathered bedrock monitoring well were completed at the Site. Details of the well abandonments are summarized in the 2020 Well Abandonment Documentation Memo (Arcadis 2021d) submitted to EGLE on March 9, 2021. Six of the eleven abandoned monitoring wells were not included in the previous IGMP. The remaining five will be removed from the IGMP matrix (**Table 1**).

7 References

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Tables

Table 1
Revised Interim Groundwater Monitoring Summary

Revised May 2019
RACER Trust Plant 2 - Lansing, Michigan

Well	Gauging*	Analyte					Primary Function	Reason(s) for Change
		VOCs	1,4-Dioxane	Select Metals**	SVOCs	PFAS		
Plant 2								
Perched								
LMW-12-01	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / No LNAPL Observed for 4 Quarters
LMW-12-02	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed in 4 Quarters was 0.04 feet.
LMW-12-03D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Eliminate LNAPL Removal
LMW-12-03S	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed in 4 Quarters was 0.01 feet.
LMW-12-04	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed in 4 Quarters was 0.02 feet.
LMW-12-05	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed in 4 Quarters was 0.18 feet.
LMW-12-06	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / No LNAPL Observed for 4 Quarters
LMW-12-07	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed in 4 Quarters was 0.02 feet.
LMW-12-08	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA
LMW-14-12D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Eliminate LNAPL Removal
LMW-14-13D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / No LNAPL Observed for One Year
LMW-14-14D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / No LNAPL Observed Monthly for One Year
LMW-14-15D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Eliminate LNAPL Removal
LMW-15-16D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Eliminate LNAPL Removal
LMW-15-17D	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / Max LNAPL Thickness Observed During Monthly Checks for One Year was 0.01 feet.
MW-01(2)	A	B					VOC sentinel	VOC Change from A to B. MTBE is detected consistently below criteria. No other VOCs detected
MW-12-07	A						groundwater elevation monitoring	Removed VOC Analysis / Has always been non-detect for VOCs
MW-12-08	A						groundwater elevation monitoring	Reduce LNAPL gauging to SA
MW-12-09	A	B	A			SA	VOC Sentinel, perched 1,4-dioxane sentinel, PFAS sentinel	
MW-12-18	SA	B				SA	VOC sentinel, PFAS sentinel	VOC change from SA to B /1,1-DCE at 1 to 2 ug/L is the only VOC detected / Removed Metals Analysis / Consistent Non-Detects
MW-14-54	A	B					VOC monitoring, SVOC evaluation	VOC change from A to B / Stable Trends. Removed SVOC Analysis / Consistent Non-Detects
MW-14-55	A	B					VOC monitoring	VOC change from A to B / Intermittent VOC detections are consistently below criteria
MW-14-57	A		A				perched 1,4-dioxane monitoring	Remove VOCs/ Intermittent VOC detections are consistently below criteria
MW-14-58	SA	B	A			SA	perched 1,4-dioxane monitoring, PFAS Monitoring	VOC Analysis changed to biennial / VOCs never detected 1,4-D Change from SA to A / Stable trend
MW-14-59	SA	B	A		Qd	SA	perched 1,4-dioxane monitoring, SVOC evaluation, PFAS monitoring	VOC change from A to B / 1,1-DCE exceeds DW but has been stable for 5 years

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Well	Gauging*	Analyte					Primary Function	Reason(s) for Change
		VOCs	1,4-Dioxane	Select Metals**	SVOCs	PFAS		
MW-14-60	SA	B	A		Qd	SA	perched 1,4-dioxane monitoring, SVOC evaluation, PFAS monitoring	VOC change from A to B / VC exceeds DW but has been stable for 3 years
MW-14-62	SA	B	A		Qd	SA	perched 1,4-dioxane monitoring, PFAS Monitoring	VOC change from A to B / Intermittent VOC detections are consistently below criteria
P2-MW-02	A						groundwater elevation monitoring	Removed VOC Analysis / Consistently non-detect for VOCs
P2-MW-03	A						groundwater elevation monitoring	
P2-MW-04	A		A		Qd		perched 1,4-dioxane monitoring, SVOC evaluation	
P2-SB-03	A						groundwater elevation monitoring	Removed VOC and 1,4-D Analysis / Consistently non-detect for VOCs and 1,4-D
P2-SB-06	A						groundwater elevation monitoring	Removed VOC and SVOC Analysis / Consistently non-detect for VOCs and SVOCs
P2-SB-20	A						groundwater elevation monitoring	Removed VOC, 1,4-d Analysis / Consistently non-detect for at least the past 6 years
P2-SB-37	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA
PMW-01	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA
PMW-02	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA
PMW-03	SA						LNAPL Monitoring	Reduce LNAPL gauging to SA / No LNAPL Observed for 4 Quarters
Deep Overburden and Weathered Bedrock								
MW-13-43	SA		SA				lower 1,4-dioxane monitoring	
MW-13-45	SA		SA				lower 1,4-dioxane monitoring	
MW-13-51	A		A				lower 1,4-dioxane sentinel	1,4-D change from B to A / Increased Monitoring of Plume
MW-14-56	A		A			SA	lower 1,4-dioxane sentinel	Removed VOC Analysis / Consistent Non-Detects Removed Metals Analysis / No exceedances 1,4-D Change from SA to A / APC plume
MW-14-61	SA	SA	SA		Qd	SA	lower 1,4-dioxane sentinel, SVOC Monitoring, PFAS Monitoring	VOC change from SA to A / Single detections of 1,1,1-TCA and Chloroethane below criteria Added SVOCs
MW-14-63	A		A				lower 1,4-dioxane sentinel	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No detections
MW-15-72	SA	A	SA		Qd	SA	lower 1,4-dioxane monitoring	Added SVOC Analysis
MW-15-73	A		A				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections Removed Metals Analysis / No metal exceedances 1,4-D Change from SA to A / APC plume
MW-16-74	SA		SA				lower 1,4-dioxane sentinel	Removed VOC Analysis / No VOC detections
MW-16-75	SA		SA				lower 1,4-dioxane sentinel	Removed VOC Analysis / No VOC detections
MW-16-76	A		A				lower 1,4-dioxane sentinel	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D exceedances
MW-16-77	SA		SA				lower 1,4-dioxane sentinel	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D exceedances
MW-16-78	SA		SA				lower 1,4-dioxane sentinel	Removed VOC Analysis / No VOC detections
MW-16-79	SA		SA				lower 1,4-dioxane sentinel	Removed VOC Analysis / No VOC detections
MW-16-80	SA		SA				lower 1,4-dioxane monitoring	Removed VOC Analysis / No VOC detections
MW-16-81	SA	A	SA			SA	lower 1,4-dioxane monitoring	VOCs change from SA to A / No VOC detections 1,4-D Change from Q to SA/ >4 samples collected
MW-16-82	SA		SA				lower 1,4-dioxane monitoring	VOCs removed / No VOC detections 1,4-D Change from Q to SA / >4 samples collected
MW-16-83	A		A				lower 1,4-dioxane sentinel	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections

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		VOCs	1,4-Dioxane	Select Metals**	SVOCs	PFAS		
MW-16-84	SA	A	SA				lower 1,4-dioxane monitoring	VOCs change from SA to A / No VOC detections 1,4-D Change from Q to SA/ >4 samples collected
MW-16-85	SA	A	SA				lower 1,4-dioxane monitoring	VOC change from SA to A / No VOC detections
MW-17-86	SA	SA	SA				lower 1,4-dioxane monitoring	Well added / VOC to A
MW-19-115	SA		SA				lower 1,4-dioxane monitoring	Well added
MW-19-116	SA		SA				lower 1,4-dioxane monitoring	Well added
MW-19-117	SA		SA				lower 1,4-dioxane monitoring	Well added
MW-19-120	SA	SA	SA				lower 1,4-dioxane monitoring	Well added
MW-20-130	SA		SA			SA	PFAS Sentinel	Well added
PW-14-01	SA		SA				lower 1,4-dioxane monitoring	
PW-14-02	SA	B	SA				lower 1,4-dioxane monitoring	VOC change from SA to B / No VOC detections
TW-14-02	SA	B	SA				lower 1,4-dioxane monitoring	VOC change from SA to B / No VOC detections
Bedrock								
MW-12-01	A		A(1)				bedrock sentinel	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections > DW
MW-12-02	A		A(1)				bedrock sentinel	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections >DW
MW-12-05R	A		A(1)				bedrock sentinel	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections >DW
MW-12-06	A		A(1)				bedrock sentinel	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections
MW-13-44	A		A(1)				bedrock sentinel	Removed VOC Analysis / No VOC detections 1,4-D Change from SA to A / No 1,4-D detections >DW
MW-17-87	A		A(1)				bedrock sentinel	Well added
MW-19-118S	A		A(1)				bedrock sentinel	New nested deep bedrock well / 1,4-Dioxane only
MW-19-118D	A		A(1)				bedrock sentinel	New nested deep bedrock well / 1,4-Dioxane only
MW-19-125	A		A(1)				bedrock sentinel	Proposed deep bedrock well / 1,4-Dioxane only
Lansing Township Wells								
TWP-03	-		A(1)				Municipal Well	
TWP-04	-		A(1)				Municipal Well	
TWP-05	-		A(1)				Municipal Well	

Notes:

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

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

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

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

M = Monthly

Q = Quarterly

SA = Semi-annual

A = Annual (2Q of each year)

B = Biennial (starting 2nd quarter of 2020)

Qd = Quadrennial

Table 1
Revised Interim Groundwater Monitoring Summary

Revised May 2019
RACER Trust Plant 3 - Lansing, Michigan

Well	Gauging*	Analyte						Primary Function	Reason(s) for Change
		VOCs	1,4-Dioxane	Select Metals**	Hexavalent Chromium	SVOCs	PFAS		
Plant 3									
Perched									
CH-14-RO	SA			A	A		SA	metals monitoring	Removed VOC Analysis / No VOC detections
LMW-12-09	SA							Reduce LNAPL gauging to SA	LNAPL Gauging will Occur SA/ Max LNAPL Thickness Observed in 4 Quarters was 0.04 feet.
LMW-12-10	SA							Reduce LNAPL gauging to SA	LNAPL Gauging will Occur SA
LMW-12-11	SA							Reduce LNAPL gauging to SA	LNAPL Gauging will Occur SA / No LNAPL Observed for 4 Quarters
MW-05(3)	A	A						VOC sentinel	ND or Stable to Decreasing Trend
MW-06(3)	Abandon								Removed VOC & SVOC Analysis / ND or Decreasing Trend / Abandon - Redundant
MW-12-19	A							groundwater elevation monitoring	
MW-13-31	A							groundwater elevation monitoring	Removed Metals & SVOCs/ Stable to Decreasing Trend /attributed to offsite
MW-13-32	A			B		Qd		groundwater elevation monitoring/ SVOC & Metals monitoring	Perimeter monitoring for metals and SVOCs
MW-13-33	Abandon								Removed Metals Analysis / Stable to Decreasing Trend / Abandon
MW-14-65	A							groundwater elevation monitoring	Removed VOC and SVOC Analysis / ND
MW-18-100	SA						SA	PFAS sentinel	Well Added
MW-18-102	SA						SA	PFAS sentinel	Well Added
MW-18-103	Q						Q	PFAS monitoring	Well Added
MW-18-104	SA						SA	PFAS sentinel	Well Added
MW-18-105	Q						Q	PFAS monitoring	Well Added
MW-18-106	SA						SA	PFAS sentinel	Well Added
MW-18-88	Q	A		A	A		Q	PFAS monitoring/ sentinel VOC & Metals	Well Added
MW-18-89	Q						Q	PFAS monitoring	Well Added
MW-18-90	Q						Q	PFAS monitoring	Well Added
MW-18-91	Q						Q	PFAS monitoring	Well Added
MW-18-92	SA						SA	PFAS sentinel	Well Added
MW-18-95	Q						Q	PFAS monitoring	Well Added
MW-18-96	SA						SA	PFAS sentinel	Well Added
MW-18-98	Q						Q	PFAS sentinel	Well Added
MW-18-99	Q						Q	PFAS sentinel	Well Added
MW-19-107	SA						SA	PFAS sentinel	Well Added
MW-19-108	SA						SA	PFAS sentinel	Well Added
MW-19-110	SA						SA	PFAS sentinel	New perched monitoring well installed August 2019
MW-19-111	SA						SA	PFAS sentinel	New perched monitoring well installed August 2019
MW-19-112	SA						SA	PFAS sentinel	New perched monitoring well installed August 2019
MW-19-113	SA						SA	PFAS sentinel	New perched monitoring well installed August 2019
MW-19-114	SA						SA	PFAS sentinel	New perched monitoring well installed August 2019
P3-SB-07	SA							groundwater elevation monitoring	Gauging used to evaluate bulkheading and PFAS area
P3-SB-28	A					Qd		groundwater elevation monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend
UNK-10	A	A						VOC sentinel, SVOC evaluation	
UNK-11	A	A				Qd		VOC monitoring/SVOCs	Removed Metals Analysis / Stable to Decreasing Trend / Added SVOC Analysis
UNK-13	SA							Reduce LNAPL gauging to SA	Change LNAPL Gauging to SA
UNK-14	SA							Reduce LNAPL gauging to SA	Change LNAPL Gauging to SA

Table 1
Revised Interim Groundwater Monitoring Summary

Revised May 2019
RACER Trust Plant 3 - Lansing, Michigan

Well	Gauging*	Analyte						Primary Function	Reason(s) for Change
		VOCs	1,4-Dioxane	Select Metals**	Hexavalent Chromium	SVOCs	PFAS		
UNK-15	Q						Q	PFAS monitoring	
Deep Overburden and Weathered Bedrock									
MW-02-01(3)	A							groundwater elevation monitoring	
MW-02-02(3)	A		A					lower 1,4-dioxane sentinel	Removed VOC Analysis / ND or Stable to Decreasing Trend / Removed Metals Analysis / Stable to Decreasing Trend
MW-02-03(3)	A							groundwater elevation monitoring	
MW-02-04(3)	SA		A	A			SA	lower 1,4-dioxane, PFAS and metals sentinel	Add PFAS
MW-04-03(3)	A							groundwater elevation monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend/VC attributed to offsite
MW-04-04(3)	A							groundwater elevation monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend/VC attributed to offsite
MW-12-20	A		B					lower 1,4-dioxane sentinel	Removed VOC Analysis / Stable to Decreasing Trend
MW-12-21	SA	B	SA					lower 1,4-dioxane monitoring	VOC Changed from A to B / Stable to Decreasing Trend Removed Metals Analysis / Stable to Decreasing Trend
MW-13-22	A	B	A					lower 1,4-dioxane monitoring	VOC Changed from A to B / Stable to Decreasing Trend Removed Metals Analysis / Stable to Decreasing Trend
MW-13-23	A		A					lower 1,4-dioxane sentinel	
MW-13-24	A		A					lower 1,4-dioxane sentinel	
MW-13-25	SA		SA					lower 1,4-dioxane monitoring	Removed VOC Analysis / Stable to Decreasing Trend
MW-13-26	A							groundwater elevation monitoring	Remove B 1,4-d / 6 yrs. ND
MW-13-27	A							groundwater elevation monitoring	
MW-13-29	A		A					lower 1,4-dioxane monitoring	
MW-13-30	A							groundwater elevation monitoring	Remove B 1,4-d / 6 yrs. ND
MW-13-34	SA	B	SA					lower 1,4-dioxane monitoring	VOC Changed from A to B / Stable to Decreasing Trend
MW-13-40	A							groundwater elevation monitoring	Removed 1,4-dioxane, added MW-18-97
MW-13-41	A	B						lower VOC sentinel	Added VOC Analysis Removed Metals Analysis / Stable to Decreasing Trend
MW-13-46	SA		SA					lower 1,4-dioxane monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend
MW-13-48	SA	B	SA					lower 1,4-dioxane monitoring	VOC Changed from A to B / Stable to Decreasing Trend
MW-13-49	A		A					lower 1,4-dioxane	Removed VOC Analysis / ND or Stable to Decreasing Trend
MW-14-64	A		A					lower 1,4-dioxane sentinel	Removed VOC Analysis / ND or Stable to Decreasing Trend
MW-15-71	A		B					lower 1,4-dioxane sentinel	1,4-D Changed from A to B / Stable to Decreasing Trend
MW-18-101	SA						SA	Lower PFAS Sentinel	Well Added
MW-18-93	SA						SA	Lower PFAS Sentinel	Well Added
MW-18-94	SA		A				SA	Lower PFAS, 1,4-Dioxane Sentinel	Well Added
MW-18-97	SA		A				SA	Lower PFAS Sentinel	Well Added
MW-19	A	B	A					lower 1,4-dioxane sentinel	
MW-22	A							metals sentinel	Removed VOC Analysis / ND or Stable to Decreasing Trend / Removed 1,4-D Analysis / Stable to Decreasing Trend
MW-23	SA						SA	PFAS sentinel	Removed VOC Analysis / ND or Stable to Decreasing Trend / Removed 1,4-D Analysis / Stable to Decreasing Trend / Add PFAS
MW-91-2 (abandoned) / MW-91-2R	SA		A	A	A		SA	lower 1,4-dioxane, PFAS and metals sentinel	Removed VOC Analysis / ND or Stable to Decreasing Trend MW-91-2 abandoned and replaced in August 2019
MW-93-1	A							groundwater elevation monitoring	
PW-14-03	SA		SA					lower 1,4-dioxane monitoring	Remove VOCs / Stable to Decreasing Trend

Table 1
Revised Interim Groundwater Monitoring Summary

Revised May 2019
RACER Trust Plant 3 - Lansing, Michigan

Well	Gauging*	Analyte						Primary Function	Reason(s) for Change
		VOCs	1,4-Dioxane	Select Metals**	Hexavalent Chromium	SVOCs	PFAS		
Bedrock									
MW-04-01(3)	Abandon								Anomalous elevation in bedrock / no used for contouring or sampling
MW-04-02(3)	A							groundwater elevation monitoring	Removed VOC Analysis / ND or Stable to Decreasing Trend/VC attributed to offsite
MW-12-04	A							groundwater elevation monitoring	
MW-13-28	SA		A(1)					bedrock sentinel	Removed VOC Analysis / ND or Stable to Decreasing Trend / 1,4-D Changed from SA to A / ND or Stable to Decreasing Trend
MW-13-37	A		A(1)					1,4-D sentinel	Added Annual 1,4-Dioxane
MW-13-38	A		A(1)					bedrock sentinel	Removed VOC Analysis / ND or Stable to Decreasing Trend / 1,4-D Changed from SA to A / ND or Stable to Decreasing Trend
MW-13-39B	A							groundwater elevation monitoring	
MW-13-47	SA		A(1)					bedrock sentinel	Removed VOC Analysis / Stable to Decreasing Trend 1,4-D Changed from SA to A / Stable to Decreasing Trend
MW-19-119D	A		A(1)					bedrock sentinel	New nested deep bedrock well / 1,4-Dioxane only
MW-19-119S	A		A(1)					bedrock sentinel	New nested deep bedrock well / 1,4-Dioxane only
MW-88-1	A							groundwater elevation monitoring	
MW-91-3	A							bedrock sentinel	Removed VOC Analysis / ND or Stable to Decreasing Trend/VC attributed to offsite
MW-91-4	A							groundwater elevation monitoring	Removed VOC Analysis / Stable to Decreasing Trend
MW-91-5	SA		A(1)					bedrock sentinel	Removed VOC Analysis / ND or Stable to Decreasing Trend / 1,4-D Changed from SA to A / ND or Stable to Decreasing Trend
MW-91-6	SA		A(1)					bedrock sentinel	Removed VOC Analysis / ND or Stable to Decreasing Trend / 1,4-D Changed from SA to A / ND or Stable to Decreasing Trend

Notes:

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

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

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

Q = quarterly

SA = semi-annual

A = annual

B = biennial (starting 2nd quarter of 2020)

Qd = Quadrennial

Well	Gauging*	Analyte					Primary Function	Reason(s) for Change
		VOCs	1,4-Dioxane	Select Metals**	SVOCs	PFAS		
Plant 6								
Perched								
MW-02-02(6)	Abandon							Only used for groundwater elevation monitoring.
MW-02-03(6)	A	B	A		Qd		perched 1,4-dioxane monitoring, SVOC evaluation	VOC Changed from A to B / Stable to Decreasing Trend
MW-03-02	A						groundwater elevation monitoring	Removed Metals Analysis / Stable to Decreasing Trend
MW-03-04	A						groundwater elevation monitoring	Removed VOC, 1,4-d Analysis / Stable to Decreasing Trend
MW-03-05	A	B	A				perched 1,4-dioxane sentinel	VOC Changed from A to B / Stable to Decreasing Trend
MW-03-06	A	B	A				perched 1,4-dioxane sentinel	VOC Changed from A to B / Stable to Decreasing Trend Removed Metals and SVOC Analysis / Stable to Decreasing Trend
MW-03-08	A	B					perched VOC monitoring	VOC Changed from A to B / removed 1,4-d /Stable to Decreasing Trend
MW-04-05(6)	A					A	perched PFAS sentinel	Removed VOC, 1,4-d and Metals Analysis / Stable to Decreasing Trend
MW-12-10R	A						groundwater elevation monitoring	
MW-12-11	A					A	PFAS Sentinel	Removed Metals Analysis / Stable to Decreasing Trend /PFAS Stability
MW-12-12	Q					Q	PFAS monitoring	Removed Metals Analysis / Stable to Decreasing Trend /PFAS Stability
MW-12-13	Q			A		Q	PFAS monitoring	Metals Changed from SA to A / Stable to Decreasing Trend / PFAS Stability
MW-12-14	A						groundwater elevation monitoring	
MW-12-15								Removed VOC Analysis / Stable to Decreasing Trend Removed Metals / Stable to Decreasing Trend attributed to offsite/ Retain well for potential PFAS monitoring
MW-12-16	A						boundary monitoring	Removed VOC Analysis / Stable to Decreasing Trend Removed Metals / Stable to Decreasing Trend attributed to offsite
MW-13-35								Removed VOC Analysis / Stable to Decreasing Trend Removed Metals / Stable to Decreasing Trend attributed to offsite/ Retain well for potential PFAS monitoring
MW-13-36R	Q			A		Q	PFAS monitoring	Metals Changed from SA to A / Stable to Decreasing Trend / PFAS Stability
MW-14-66	A			B			metals /PFAS sentinel	Removed VOC Analysis / Stable to Decreasing Trend / Added PFAS
MW-14-67	Q			B		Q	metals sentinel	Removed VOC Analysis / Stable to Decreasing Trend
MW-14-68	A						PFAS Sentinel	Dry Since Installation in 2014 / Continue to check Annually
MW-14-69	A						PFAS Sentinel	Dry Since Installation in 2014 / Continue to check Annually
MW-14-70	Q					Q	PFAS Sentinel	PFAS Stability
MW-20-131	Q	Q				Q	VOC monitoring	New well. Quarterly VOC sampling for 4 quarters (PFAS in Q1 2021)
MW-20-132	Q	Q				Q	VOC monitoring	New well. Quarterly VOC sampling for 4 quarters (PFAS in Q1 2021)
MW-21-133	Q					Q	PFAS Perimeter Monitoring	Well added for 2021 Sampling

Table 1
Revised Interim Groundwater Monitoring Summary

Revised May 2019
RACER Trust Plant 6 - Lansing, Michigan

Well	Gauging*	Analyte					Primary Function	Reason(s) for Change
		VOCs	1,4-Dioxane	Select Metals**	SVOCs	PFAS		
MW-21-134	Q					Q	PFAS Perimeter Monitoring	Well added for 2021 Sampling
MW-21-135	Q					Q	PFAS Perimeter Monitoring	Well added for 2021 Sampling
MW-21-136	Q					Q	PFAS Perimeter Monitoring	Well added for 2021 Sampling
MW-21-137	Q					Q	PFAS Perimeter Monitoring	Well added for 2021 Sampling
MW-21-138	Q					Q	PFAS Perimeter Monitoring	Well added for 2021 Sampling
MWBP-10-UST5-6	A	B		B			VOCs/metal monitoring	VOC Changed from A to B / Stable to Decreasing Trends Metals Changed from SA to B / Stable to Decreasing Trends
MWBP-11-UST1-4	A	B		B			VOCs/metal monitoring	VOC Changed from A to B / Stable to Decreasing Trends
MWBP-12-UST1-4	A	B		B	Qd		VOCs/metal monitoring, SVOC evaluation	VOC Changed from A to B / Stable to Decreasing Trends
MWBP-12-UST5-6	Plan to Abandon							Consistently non detect for VOCs/stable metals. High well density in area 7.
P6-MW-01	A						groundwater elevation monitoring	
P6-SB-07	Q				Qd	Q	PFAS monitoring	PFAS Stability
P6-SB-18	A						groundwater elevation monitoring	
P6-SB-21	A						groundwater elevation monitoring	
P6-SB-35	A						groundwater elevation monitoring	
P6-SB-37	A						groundwater elevation monitoring	
SME-MW-02	Plan to Abandon							Only used for groundwater elevation monitoring.
Deep Overburden and Weathered Bedrock								
MW-13-52	A		A				lower 1,4-dioxane sentinel	Removed VOC Analysis / Stable to Decreasing Trend 1,4-D Changed from B to A
MW-13-53	A		A				lower 1,4-dioxane sentinel	Removed VOC Analysis / Stable to Decreasing Trend 1,4-D Changed from B to A
Bedrock								
MW-04-01(6)	A		B				bedrock sentinel	Removed VOC Analysis / Stable to Decreasing Trend
MW-04-04R	A		B			A	bedrock sentinel	Removed VOC Analysis / Stable to Decreasing Trend
MW-04-06R	A		B			A	bedrock sentinel	Removed VOC Analysis / Stable to Decreasing Trend
MW-12-03	A						groundwater elevation monitoring	
MW-13-50	A		B				bedrock sentinel	Removed VOC Analysis / Stable to Decreasing Trend

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

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	CH-14-RO 06/08/20 CH-14-RO_060820	CH-14-RO 12/08/20 CH-14-RO_120820	MW-01(2) 06/10/20 MW-01(2)_061020	MW-02-02(3) 06/11/20 MW-02-02(3)_061120	MW-02-03(6) 06/03/20 MW-02-03(6)_060320	MW-02-04(3) 06/08/20 MW-02-04(3)_060820	MW-02-04(3) 12/08/20 MW-02-04(3)_120820	MW-03-05 06/03/20 MW-03-05_060320	MW-03-06 06/02/20 MW-03-06_060220	MW-03-07 06/08/20 MW-03-07_060820	MW-03-08 06/03/20 MW-03-08_060320	MW-03-08 06/09/20 MW-03-08_060920	MW-04-01(6) 06/02/20 MW-04-01(6)_060220
Field																
Conductivity	- -	- -	mS/cm	0.79	0.56	4.31	4.88	7.34	5.41	4.71	2.60	10.29	1.34	2.45	2.05	0.92
Dissolved oxygen (DO)	- -	- -	mg/L	0.42	0.11	0.78	0.01	9.65	0.01	5.58	6.32	0.33	0.58	0.73	0.02	0.35
Oxidation reduction potential (ORP)	- -	- -	millivolts	63.2	122.1	-17.4	37.6	-99.3	-36	-65.9	-104.1	-55.5	-100.9	-110.5	-84.7	-50.1
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.11	7.13	6.86	6.36	7.50	6.75	6.89	7.72	6.84	7.22	7.27	7.02	7.04
Temperature	- -	- -	Deg C	19.4	13.6	19.2	14.4	15.1	14.3	9	13.2	14.7	16.1	14.5	13.4	15.5
Turbidity	- -	- -	NTU	0.02	0.53	0.02	1.74	384	2.7	135	20.1	0.72	0.02	46.8	1.78	0.02
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	<2	NA	<2	NA	NA	<2	<2	NA	<2	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	<10	NA	<10	NA	NA	<10	<10	NA	<10	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	<90	NA	<90	NA	NA	<90	<90	NA	<90	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	<1	**15**	**3**	NA	<1	**5**	NA	NA	NA	<1
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	<50	NA	<50	NA	NA	<50	<50	NA	<50	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Acetone	730	1,700	µg/L	NA	NA	<50	NA	<50	NA	NA	<50	<50	NA	<50	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Bromoform	80	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	**12**	NA	<1	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
Benzene	5.0	200	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
Styrene	100	80	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Toluene	790	270	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	**12**	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Naphthalene	520	11	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	<25	NA	<25	NA	NA	<25	<25	NA	<25	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	<50	NA	<50	NA	NA	<50	<50	NA	<50	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	<1	NA	<1	NA	NA	<1	<1	NA	<1	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	<2	NA	<2	NA	NA	<2	<2	NA	<2	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	<2	NA	<2	NA	NA	<2	<2	NA	<2	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	<5	NA	<5	NA	NA	<5	<5	NA	<5	NA	NA

See notes on last page.

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

Location ID:	P201 Residential	P201 Groundwater Surface Water		CH-14-RO	CH-14-RO	MW-01(2)	MW-02-02(3)	MW-02-03(6)	MW-02-04(3)	MW-02-04(3)	MW-03-05	MW-03-06	MW-03-07	MW-03-08	MW-03-08	MW-04-01(6)
Date Collected:				06/08/20	12/08/20	06/10/20	06/11/20	06/03/20	06/08/20	12/08/20	06/03/20	06/02/20	06/08/20	06/03/20	06/09/20	06/02/20
Sample Name:	Drinking Water	Interface	Units	CH-14-RO_060820	CH-14-RO_120820	MW-01(2)_061020	MW-02-02(3)_061120	MW-02-03(6)_060320	MW-02-04(3)_060820	MW-02-04(3)_120820	MW-03-05_060320	MW-03-06_060220	MW-03-07_060820	MW-03-08_060320	MW-03-08_060920	MW-04-01(6)_060220
Inorganics (via EPA Method 537 Modified)																
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	<0.002	NA	NA	NA	NA	**0.071**	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	**7.21**	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	**8.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	<0.005	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	<0.003	NA	NA	NA	NA	<0.003	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	**0.012**	NA	NA	NA	NA	**0.017**	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	<0.005	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	<7.1	NA	NA	NA	NA	<7.1	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	<7.1	<7.1	NA	NA	NA	<7.1	<7.1	NA	NA	<6.9	NA	<6.9	NA
6:2 FTS	- -	- -	ng/L	<71	<36	NA	NA	NA	<7.1	<7.1	NA	NA	<6.9	NA	<6.9	NA
8:2 FTS	- -	- -	ng/L	<7.1	<7.1	NA	NA	NA	<7.1	<7.1	NA	NA	<6.9	NA	<6.9	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	<7.1	NA	NA	NA	NA	<7.1	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	<36	NA	NA	NA	NA	<7.1	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	<3.6	NA	NA	NA	NA	<3.6	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	<710	<3.6	NA	NA	NA	<7.1	<3.6	NA	NA	<6.9	NA	<6.9	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	<710	<3.6	NA	NA	NA	<7.1	<3.6	NA	NA	<6.9	NA	<6.9	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	**113**	**86.5**	NA	NA	NA	<3.6	**1.5 J**	NA	NA	<3.4	NA	<3.4	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**17.2**	**17.1**	NA	NA	NA	**6.5 J**	**8**	NA	NA	**4.1 J**	NA	<6.9	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	<3.6	<1.8	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	<3.4	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	<3.6	<1.8	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	<3.4	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<360	<1.8	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	<3.4	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	**367**	**486**	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	<3.4	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**29.7**	**25.3**	NA	NA	NA	<3.6	<1.8	NA	NA	**1.4 J**	NA	<3.4	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	**1,560**	**1,400**	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	<3.4	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**35.9**	**32.2**	NA	NA	NA	**0.93 J**	**1.8**	NA	NA	**5.1**	NA	<3.4	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<3.6	<1.8	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	<3.4	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	<3.6	**0.96 J**	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	<3.4	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	<3.6	<3.6	NA	NA	NA	<3.6	<3.6	NA	NA	<3.4	NA	<3.4	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**12,900**	**9,390**	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	**3.4**	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	**69.2**	**84.7**	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	**0.95 J**	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	**222**	**189**	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	<3.4	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**15.6**	**13.5**	NA	NA	NA	**3 J**	**6.3**	NA	NA	**8.1**	NA	<3.4	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<360	<1.8	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	<3.4	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<360	<1.8	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	<3.4	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<36	<1.8	NA	NA	NA	<3.6	<1.8	NA	NA	<3.4	NA	<3.4	NA

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Location ID:	P201 Residential	P201 Groundwater Surface Water		MW-04-04R	MW-04-05(6)	MW-04-06R	MW-05(3)	MW-12-01*	MW-12-02*	MW-12-05R*	MW-12-06*	MW-12-09	MW-12-09	MW-12-11	MW-12-12	MW-12-12	MW-12-12
Date Collected:				06/03/20	06/03/20	06/03/20	06/08/20	06/05/20	06/04/20	06/05/20	06/04/20	06/08/20	12/04/20	06/04/20	03/03/20	06/03/20	08/31/20
Sample Name:	Drinking Water	Interface	Units	MW-04-04R_060320	MW-04-05(6)_060320	MW-04-06R_060320	MW-05(3)_060820	MW-12-01_060520	MW-12-02_060420	MW-12-05R_060520	MW-12-06_060420	MW-12-09_060820	MW-12-09_120420	MW-12-11_060420	MW-12-12_030320	MW-12-12_060320	MW-12-12_083120
Field																	
Conductivity	- -	- -	mS/cm	1.64	4.25	5.40	0.18	1.90	1.21	1.66	0.92	2.28	1.70	5.33	0.49	0.59	0.61
Dissolved oxygen (DO)	- -	- -	mg/L	2.65	0.43	0.12	1.35	0.69	1.42	5.68	5.51	0.21	0.10	0.51	0.14	0.34	0.10
Oxidation reduction potential (ORP)	- -	- -	millivolts	-65.5	-85.6	-264.5	-60.8	-32.4	-68.4	-177.8	-152.7	-46	-53.2	-72.3	104.2	-31.1	-47
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.97	7.25	7.51	10.22	7.16	6.95	7.19	7.34	6.92	7.16	6.77	7.78	7.59	7.42
Temperature	- -	- -	Deg C	20.1	16.4	16.1	21.5	15.6	14.2	19.7	24.8	17.4	14.1	12.6	8.5	17.9	17.9
Turbidity	- -	- -	NTU	3.21	0.8	9.12	12	9.57	93.4	13.4	9.68	8.89	1.22	0.02	1.02	10.1	1.13
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	<2	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	<10	NA	NA	NA	NA	<10	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	<90	NA	NA	NA	NA	<90	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	<1 [<1]	NA	<1	NA	<0.20*	**0.65***	**0.16 J***	<0.20*	**2**	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	<50	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	<50	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	<25	NA	NA	NA	NA	<25	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	<50	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	<1	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	<2	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	<2	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	<5	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-04-04R 06/03/20 MW-04-04R_060320	MW-04-05(6) 06/03/20 MW-04-05(6)_060320	MW-04-06R 06/03/20 MW-04-06R_060320	MW-05(3) 06/08/20 MW-05(3)_060820	MW-12-01* 06/05/20 MW-12-01_060520	MW-12-02* 06/04/20 MW-12-02_060420	MW-12-05R* 06/05/20 MW-12-05R_060520	MW-12-06* 06/04/20 MW-12-06_060420	MW-12-09 06/08/20 MW-12-09_060820	MW-12-09 12/04/20 MW-12-09_120420	MW-12-11 06/04/20 MW-12-11_060420	MW-12-12 03/03/20 MW-12-12_030320	MW-12-12 06/03/20 MW-12-12_060320	MW-12-12 08/31/20 MW-12-12_083120
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.1	NA	NA	NA	<7.4
4:2 FTS	- -	- -	ng/L	<6.9 [<6.7]	<6.7	<7.1	NA	NA	NA	NA	NA	<7.1	<7.1	<6.9	<6.9	<6.9	<7.4
6:2 FTS	- -	- -	ng/L	<6.9 [<6.7]	<6.7	<7.1	NA	NA	NA	NA	NA	<7.1	<7.1	<6.9	<6.9	<6.9	<7.4
8:2 FTS	- -	- -	ng/L	<6.9 [<6.7]	<6.7	<7.1	NA	NA	NA	NA	NA	<7.1	<7.1	<6.9	<6.9	<6.9	<7.4
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.1	NA	NA	NA	<7.4
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.1	NA	NA	NA	<7.4
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	NA	NA	NA	<9.3
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	<6.9 [<6.7]	<6.7	<7.1	NA	NA	NA	NA	NA	<7.1	<3.6	<6.9	<6.9	<6.9	<3.7
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	<6.9 [<6.7]	<6.7	<7.1	NA	NA	NA	NA	NA	<7.1	<3.6	<6.9	<6.9	<6.9	<3.7
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	<3.4 [<3.3]	**1.4 J**	<3.6	NA	NA	NA	NA	NA	**1.6 J**	**1.6 J**	<3.4	**1.4 J**	**1.1 J**	**1.2 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	<6.9 [<6.7]	**25.6**	**2.8 J**	NA	NA	NA	NA	NA	**6 J**	**6.6**	**5.8 J**	**41.8**	**36.3**	**48.3**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	<3.4 [<3.3]	<3.3	<3.6	NA	NA	NA	NA	NA	<3.6	<1.8	<3.4	<3.4	<3.4	<1.9
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	<3.4 [<3.3]	<3.3	<3.6	NA	NA	NA	NA	NA	<3.6	<1.8	<3.4	**8.5**	**10.2**	**18.1**
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<3.4 [<3.3]	<3.3	<3.6	NA	NA	NA	NA	NA	<3.6	<1.8	<3.4	<3.4	<3.4	<1.9
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	<3.4 [<3.3]	<3.3	<3.6	NA	NA	NA	NA	NA	<3.6	<1.8	<3.4	<3.4	**0.96 J**	<1.9
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	<3.4 [<3.3]	**28.5**	<3.6	NA	NA	NA	NA	NA	**4.5**	**4.7**	<3.4	**45.8**	**31.8**	**69.8**
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	<3.4 [<3.3]	**1.1 J**	<3.6	NA	NA	NA	NA	NA	**1.9 J**	**3.5**	<3.4	**1.1 J**	**1.2 J**	**1.7 J**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	<3.4 [<3.3]	**47.3**	**0.89 J**	NA	NA	NA	NA	NA	**4.6**	**4.6**	**0.87 J**	**95.1**	**70.3**	**121**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<3.4 [<3.3]	<3.3	<3.6	NA	NA	NA	NA	NA	<3.6	<1.8	<3.4	<3.4	<3.4	<1.9
Perfluorononanoic acid (PFNA)	6	- -	ng/L	<3.4 [<3.3]	<3.3	<3.6	NA	NA	NA	NA	NA	<3.6	<1.8	<3.4	**7.7**	**7.8**	**11.5**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	<3.4 [<3.3]	<3.3	<3.6	NA	NA	NA	NA	NA	<3.6	<3.6	<3.4	<3.4	<3.4	<19
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<3.4 [1.3 J]	<3.3	**2.1 J**	NA	NA	NA	NA	NA	<3.6	<1.8	<3.4	**40.6**	**45.4**	**67.5**
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<3.4 [<3.3]	**23.9**	<3.6	NA	NA	NA	NA	NA	**12.6**	**15.4**	<3.4	**69.7**	**60.9**	**117**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	<3.4 [<3.3]	**1 J**	<3.6	NA	NA	NA	NA	NA	<3.6	<1.8	<3.4	<3.4	<3.4	<1.9
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	<3.4 [<3.3]	**40**	**1.8 J**	NA	NA	NA	NA	NA	**3.3 J**	**3.5**	**2.1 J**	**79**	**59.8**	**89.1**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<3.4 [<3.3]	<3.3	<3.6	NA	NA	NA	NA	NA	<3.6	<1.8	<3.4	<3.4	<3.4	<1.9
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<3.4 [<3.3]	<3.3	<3.6	NA	NA	NA	NA	NA	<3.6	<1.8	<3.4	<3.4	<3.4	<1.9
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<3.4 [<3.3]	<3.3	<3.6	NA	NA	NA	NA	NA	<3.6	<1.8	<3.4	<3.4	<3.4	<1.9

See notes on last page.

Table 2
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2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-12-12 12/02/20 MW-12-12_120220	MW-12-13 03/04/20 MW-12-13_030420	MW-12-13 06/04/20 MW-12-13_060420	MW-12-13 08/31/20 MW-12-13_083120	MW-12-13 12/02/20 MW-12-13_120220	MW-12-18 06/08/20 MW-12-18_060820	MW-12-18 12/04/20 MW-12-18_120420	MW-12-20 06/10/20 MW-12-20_061020	MW-12-21 06/11/20 MW-12-21_061120	MW-12-21 12/08/20 MW-12-21_120820	MW-13-22 03/03/20 MW-13-22_030320	MW-13-22 06/11/20 MW-13-22_061120	MW-13-22 08/27/20 MW-13-22_082720	MW-13-22 12/01/20 MW-13-22_120120
Field																	
Conductivity	- -	- -	mS/cm	0.62	0.66	0.99	0.72	0.87	2.24	1.62	1.54	1.41	1.41	1.98	1.94	1.89	1.17
Dissolved oxygen (DO)	- -	- -	mg/L	0.37	0.85	0.27	0.07	4.11	0.24	0.29	0.33	0.62	0.20	0.23	0.59	1.52	3.55
Oxidation reduction potential (ORP)	- -	- -	millivolts	46.3	121.3	-22.2	-119.5	40.5	-18.1	-57.3	-78.9	-60.9	-52.3	-44.9	-85.6	-42.8	-25.9
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.68	7.50	7.26	7.38	7.32	7.06	6.97	6.86	6.85	6.90	6.82	6.95	6.87	6.81
Temperature	- -	- -	Deg C	13.2	9.2	13.6	15.9	12.4	15.4	11	16.6	14.5	12.2	11.7	14.2	21.4	2.4
Turbidity	- -	- -	NTU	5.32	1.2	0.02	2.62	7.42	18.8	1.02	16.1	57.5	91.1	23.3	58.7	3.97	637
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	<2	NA	NA	<2	NA	NA	<2	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	<10	NA	NA	<10	NA	NA	<10	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	<90	NA	NA	<90	NA	NA	<90	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	**230 Y**	**310 Y**	**203 Y**	**157**	**141**	**162**
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	<50	NA	NA	<50	NA	NA	<50	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	<50	NA	NA	<50	NA	NA	<50	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	**2**	NA	NA	<1	NA	NA	<1	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	<25	NA	NA	<25	NA	NA	<25	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	<50	NA	NA	<50	NA	NA	<50	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	<1	NA	NA	<1	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	<2	NA	NA	<2	NA	NA	<2	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	<2	NA	NA	<2	NA	NA	<2	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	<5	NA	NA	<5	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-12-12 12/02/20 MW-12-12_120220	MW-12-13 03/04/20 MW-12-13_030420	MW-12-13 06/04/20 MW-12-13_060420	MW-12-13 08/31/20 MW-12-13_083120	MW-12-13 12/02/20 MW-12-13_120220	MW-12-18 06/08/20 MW-12-18_060820	MW-12-18 12/04/20 MW-12-18_120420	MW-12-20 06/10/20 MW-12-20_061020	MW-12-21 06/11/20 MW-12-21_061120	MW-12-21 12/08/20 MW-12-21_120820	MW-13-22 03/03/20 MW-13-22_030320	MW-13-22 06/11/20 MW-13-22_061120	MW-13-22 08/27/20 MW-13-22_082720	MW-13-22 12/01/20 MW-13-22_120120
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	<0.002 [<0.002]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	<0.005 [<0.005]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	<0.005 [<0.005]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	<0.003 [<0.003]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	**0.008 [0.007]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	<0.005 [<0.005]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	<7.1	NA	NA	<7.4	<7.1	NA	<7.1	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	<7.1	<6.9	<6.9 [<6.9]	<7.4	<7.1	<7.1	<7.1	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	<7.1	<6.9	<6.9 [<6.9]	<7.4	<7.1	<7.1	<7.1	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	<7.1	<6.9	<6.9 [<6.9]	<7.4	<7.1	<7.1	<7.1	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	<7.1	NA	NA	<7.4	<7.1	NA	<7.1	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	<7.1	NA	NA	<7.4	<7.1	NA	<7.1	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	<3.6	NA	NA	<9.3	<3.6	NA	<3.6	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	<3.6	<6.9	<6.9 [<6.9]	<3.7	<3.6	<7.1	<3.6	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	<3.6	<6.9	<6.9 [<6.9]	<3.7	<3.6	<7.1	<3.6	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	**1.1 J**	<3.4	**1.4 J [1.6 J]**	**2.1**	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**44.7**	**32.2**	**34.7 [34.6]**	**31.7**	**32.6**	**3.6 J**	**3.9**	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	<1.8	<3.4	<3.4 [<3.4]	<1.9	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	**16.9**	<3.4	<3.4 [<3.4]	<1.9	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<1.8	<3.4	<3.4 [<3.4]	<1.9	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	<1.8	<3.4	<3.4 [<3.4]	<1.9	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**55.6**	**14.4**	**13.7 [14.4]**	**17.8**	**15.6**	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	**1.9**	<3.4	<3.4 [<3.4]	<1.9	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**95.6**	**55.6**	**56.4 [57]**	**61.2**	**61.6**	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<1.8	<3.4	<3.4 [<3.4]	<1.9	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	**9.8**	<3.4	<3.4 [<3.4]	<1.9	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	<3.6	<3.4	<3.4 [<3.4]	<3.7	<3.6	<3.6	<3.6	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**66**	<3.4	<3.4 [<3.4]	<1.9	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	**91.2**	**1.1 J**	**1.3 J [1.3 J]**	**1.9**	**1.9**	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	<1.8	<3.4	<3.4 [<3.4]	**0.95 J**	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**72.3**	**43.9**	**42.4 [42.6]**	**38.6**	**41.9**	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<1.8	<3.4	<3.4 [<3.4]	<1.9	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<1.8	<3.4	<3.4 [<3.4]	<1.9	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<1.8	<3.4	<3.4 [<3.4]	<1.9	<1.8	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential	P201 Groundwater Surface Water		MW-13-23	MW-13-24	MW-13-25	MW-13-25	MW-13-28*	MW-13-29	MW-13-32	MW-13-34	MW-13-34	MW-13-34	MW-13-35	MW-13-35	MW-13-36R	MW-13-36R
Date Collected:				06/11/20	06/10/20	06/10/20	12/08/20	06/03/20	06/10/20	06/08/20	06/10/20	08/27/20	12/01/20	02/18/20	08/31/20	02/17/20	03/04/20
Sample Name:	Drinking Water	Interface	Units	MW-13-23_061120	MW-13-24_061020	MW-13-25_061020	MW-13-25_120820	MW-13-28_060320	MW-13-29_061020	MW-13-32_060820	MW-13-34_061020	MW-13-34_082720	MW-13-34_120120	MW-13-35_021820	MW-13-35_083120	MW-13-36R_021720	MW-13-36R_030420
Field																	
Conductivity	- -	- -	mS/cm	2.30	1.03	2.11	2.25	0.25	3.03	0.55	1.81	2.28	1.64	1.46	1.66	0.92	1.03
Dissolved oxygen (DO)	- -	- -	mg/L	0.80	0.60	6.06	3.30	7.36	0.26	0.14	0.01	0.35	0.12	0.78	0.18	0.37	0.06
Oxidation reduction potential (ORP)	- -	- -	millivolts	54.7	-76.7	-71	-44	56.4	-42.1	-2.4	-91.5	-97.9	-70.6	41	-121.1	57.2	164
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.61	7.00	7.08	6.89	10.46	6.67	6.99	6.88	6.93	6.97	6.66	7.03	10.74	11.98
Temperature	- -	- -	Deg C	15.7	15.6	18.2	10.3	22.2	16.1	14.7	15	21.2	9.7	9.7	16.8	5.8	5.9
Turbidity	- -	- -	NTU	35.7	3.97	11.1	4.54	9.17	6.1	0.02	1.2	204	94.5	3.5	1.4	1.88	1.25
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<10	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	<90	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	<1	**1**	**9**	**17**	**0.78***	**35**	NA	**81**	**75**	**106**	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	<25	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-13-23 06/11/20 MW-13-23_061120	MW-13-24 06/10/20 MW-13-24_061020	MW-13-25 06/10/20 MW-13-25_061020	MW-13-25 12/08/20 MW-13-25_120820	MW-13-28* 06/03/20 MW-13-28_060320	MW-13-29 06/10/20 MW-13-29_061020	MW-13-32 06/08/20 MW-13-32_060820	MW-13-34 06/10/20 MW-13-34_061020	MW-13-34 08/27/20 MW-13-34_082720	MW-13-34 12/01/20 MW-13-34_120120	MW-13-35 02/18/20 MW-13-35_021820	MW-13-35 08/31/20 MW-13-35_083120	MW-13-36R 02/17/20 MW-13-36R_021720	MW-13-36R 03/04/20 MW-13-36R_030420
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	<0.002	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	**0.041**	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	**0.005**	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	<0.003	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	**0.185**	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<6.7
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<6.7
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<6.7
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**6.6 J**
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.9 J**
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.3
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**25.9**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.3
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**22.8**
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.3
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.3
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**36.3**
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.3
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**29.9**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.3
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**13**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<17
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**44.5**
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**72.1**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.3
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**33.6**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.3
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.3
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.84 J**

See notes on last page.

Table 2
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2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-13-36R 06/04/20 MW-13-36R_060420	MW-13-36R 08/31/20 MW-13-36R_083120	MW-13-36R 12/02/20 MW-13-36R_120220	MW-13-37* 06/03/20 MW-13-37_060320	MW-13-38* 06/04/20 MW-13-38_060420	MW-13-41 06/11/20 MW-13-41_061120	MW-13-43 06/09/20 MW-13-43_060920	MW-13-43 12/04/20 MW-13-43_120420	MW-13-44* 06/04/20 MW-13-44_060420	MW-13-45 06/09/20 MW-13-45_060920	MW-13-45 12/04/20 MW-13-45_120420	MW-13-46 06/10/20 MW-13-46_061020	MW-13-46 12/07/20 MW-13-46_120720	MW-13-47* 06/04/20 MW-13-47_060420
Field																	
Conductivity	- -	- -	mS/cm	1.18	1.42	1.33	0.75	1.70	4.47	2.31	2.49	1.46	1.06	1.14	2.06	2.26	1.70
Dissolved oxygen (DO)	- -	- -	mg/L	0.13	0.12	0.78	5.28	0.50	0.24	0.28	4.26	4.48	0.18	0.09	0.49	0.10	5.11
Oxidation reduction potential (ORP)	- -	- -	millivolts	46	-225.1	82.6	122.4	148.9	-119.6	-84.5	88.9	-68.9	-1	-95.5	-48.8	-46.7	-142.5
pH	6.5 to 8.5	6.5 to 9.0	s.u.	11.62	11.98	11.58	8.89	9.25	7.46	7.07	7.08	7.23	7.25	7.21	6.55	6.67	7.17
Temperature	- -	- -	Deg C	15.5	19.5	11	25.3	15	15.1	15.5	11.7	23	15.4	12.7	14.7	11.8	25.6
Turbidity	- -	- -	NTU	0.02	1.3	8.23	9.69	15.1	72.1	61	680	25.9	17.9	3.21	2.92	40.9	9.38
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	<10	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	<90	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	**0.32***	**2.0***	NA	**230 Y**	**15**	**0.79***	**38**	**58**	<1	<1	**0.98***
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	<25	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-13-36R	MW-13-36R	MW-13-36R	MW-13-37*	MW-13-38*	MW-13-41	MW-13-43	MW-13-43	MW-13-44*	MW-13-45	MW-13-45	MW-13-46	MW-13-46	MW-13-47*
Date Collected:				06/04/20	08/31/20	12/02/20	06/03/20	06/04/20	06/11/20	06/09/20	12/04/20	06/04/20	06/09/20	12/04/20	06/10/20	12/07/20	06/04/20
Sample Name:				MW-13-36R_060420	MW-13-36R_083120	MW-13-36R_120220	MW-13-37_060320	MW-13-38_060420	MW-13-41_061120	MW-13-43_060920	MW-13-43_120420	MW-13-44_060420	MW-13-45_060920	MW-13-45_120420	MW-13-46_061020	MW-13-46_120720	MW-13-47_060420
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	<0.002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	<0.003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	**0.005**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	<7.4 [<7.7]	<7.1 [<7.1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	<6.7	<7.4 [<7.7]	<7.1 [<7.1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	<6.7	4.6 J [<7.7]	<7.1 [<7.1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	<6.7	<7.4 [<7.7]	<7.1 [<7.1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	<7.4 [<7.7]	<7.1 [<7.1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	<7.4 [<7.7]	<7.1 [<7.1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	<9.3 [<9.6]	<3.6 [<3.6]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	**6.3 J**	**8.5 [7.6]**	**7.2 [5.6]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	**3.6 J**	**5.1 [4.1]**	**4.3 [3.8]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	**4.5**	**2.2 [2.3]**	**2.5 [3.5]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**22.6**	**22.7 [24.9]**	**39.5 [28]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	**1.2 J**	<1.9 [<1.9]	2.3 [<1.8]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	**20.3**	**22.1 [21.4]**	**23 [20.7]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<3.3	<1.9 [<9.6]	<1.8 [<1.8]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	<3.3	<1.9 [<1.9]	<1.8 [0.91 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**34.5**	**28.8 [27.6]**	**38.8 [33.8]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	**1.5 J**	<1.9 [<1.9]	**1.9 [1.5 J]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**27.4**	**27.4 [26.2]**	**34.6 [33]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<3.3	<1.9 [<1.9]	<1.8 [<1.8]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	**11.6**	**11.7 [11.4]**	**13.7 [14.1]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	**5.8**	<19 [<19]	**6.5 [6.6]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**46.7**	**52.7 [54.4]**	**53.1 [48.4]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	**66.9**	**62.8 [60.2]**	**75.2 [74.5]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	<3.3	<1.9 [<1.9]	<1.8 [<1.8]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**27.9**	**24.8 [20.8]**	**31.5 [31.8]**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<3.3	<9.3 [<9.6]	<1.8 [<1.8]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<3.3	<9.3 [<9.6]	<1.8 [<1.8]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<3.3	<1.9 [<1.9]	0.89 J [<1.8]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-13-48 06/10/20 MW-13-48_061020	MW-13-48 12/07/20 MW-13-48_120720	MW-13-49 06/10/20 MW-13-49_061020	MW-13-50 06/04/20 MW-13-50_060420	MW-13-51 06/08/20 MW-13-51_060820	MW-13-52 06/04/20 MW-13-52_060420	MW-13-53 06/04/20 MW-13-53_060420	MW-14-54 06/09/20 MW-14-54_060920	MW-14-55 06/09/20 MW-14-55_060920	MW-14-56 06/08/20 MW-14-56_060820	MW-14-56 12/03/20 MW-14-56_120320	MW-14-57 06/09/20 MW-14-57_060920	MW-14-58 06/09/20 MW-14-58_060920	MW-14-58 12/04/20 MW-14-58_120420
Field																	
Conductivity	- -	- -	mS/cm	2.10	2.53	1.48	1.31	1.57	1.65	1.68	1.29	0.64	4.33	4.10	0.64	5.02	4.09
Dissolved oxygen (DO)	- -	- -	mg/L	0.01	0.04	0.27	0.66	0.48	1.33	5.85	0.06	6.36	5.14	0.57	1.37	0.19	0.11
Oxidation reduction potential (ORP)	- -	- -	millivolts	-68.9	-66.7	-50.2	-131.8	-10.8	-60.3	-23.4	-309.9	50.6	-49.2	-42.9	62.9	-78.5	-77.8
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.58	6.85	6.68	7.16	6.92	7.09	7.05	8.44	7.42	6.71	7.03	7.48	6.73	6.78
Temperature	- -	- -	Deg C	14.4	11.6	15.3	17.3	25.1	15	14.9	14.6	13.2	13.8	12.4	13.9	19.9	13.3
Turbidity	- -	- -	NTU	1.6	0.02	1.6	14.5	16	17.8	10.2	4.16	10.6	1.6	1.32	11.4	20.8	2.4
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
1,2,3-Trichloropropane	42	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	**230 Y**	<1	NA	NA	NA	<1	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Acrylonitrile	2.6	2	µg/L	<2	NA	NA	NA	NA	NA	NA	<20 Y	<2	NA	NA	NA	<2	NA
Bromobenzene	18	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Chlorobromomethane	- -	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
Dibromomethane	80	- -	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
Ethyl ether	10	- -	µg/L	<10	NA	NA	NA	NA	NA	NA	<100 Y	<10	NA	NA	NA	<10	NA
Iodomethane	- -	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
N-Butylbenzene	80	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
N-Propylbenzene	80	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	**190 Y**	<1	NA	NA	NA	<1	NA
tert-Butylbenzene	80	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Tetrahydrofuran	95	11,000	µg/L	<90	NA	NA	NA	NA	NA	NA	<900 Y	<90	NA	NA	NA	<90	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
1,2-Dichlorobenzene	600	13	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
1,4-Dichlorobenzene	75	17	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
1,4-Dioxane	7.2	280	µg/L	**128**	**137 [137]**	<1	<1	<1	<1	<1	NA	NA	**12**	NA	**1**	**38**	NA
1,1,1-Trichloroethane	200	89	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
2-Hexanone	1,000	- -	µg/L	<50	NA	NA	NA	NA	NA	NA	<500 Y	<50	NA	NA	NA	<50	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Acetone	730	1,700	µg/L	<50	NA	NA	NA	NA	NA	NA	<500 Y	<50	NA	NA	NA	<50	NA
1,1,2-Trichloroethane	5.0	330	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Bromodichloromethane	80	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
1,1-Dichloroethane	880	740	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Bromoform	80	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
1,1-Dichloroethene	7.0	130	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
1,2-Dichloroethane	5.0	360	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Carbon disulfide	800	- -	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
Carbon tetrachloride	5.0	38	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
cis-1,2-Dichloroethene	70	620	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Chlorobenzene	100	25	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Chloroform (Trichloromethane)	80	350	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Trichloroethene	5.0	200	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
Tetrachloroethene	5.0	60	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Vinyl chloride	2.0	13	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
2-Methylnaphthalene	260	19	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
Chloroethane	430	1,100	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
Benzene	5.0	200	µg/L	<1	NA	NA	NA	NA	NA	NA	**620 Y**	<1	NA	NA	NA	<1	NA
Ethylbenzene	74	18	µg/L	<1	NA	NA	NA	NA	NA	NA	**1,710 Y**	<1	NA	NA	NA	<1	NA
Methylene chloride	5.0	1,500	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
Styrene	100	80	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Toluene	790	270	µg/L	<1	NA	NA	NA	NA	NA	NA	**130 Y**	<1	NA	NA	NA	<1	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Naphthalene	520	11	µg/L	<5	NA	NA	NA	NA	NA	NA	**220 Y**	<5	NA	NA	NA	<5	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	<25	NA	NA	NA	NA	NA	NA	<250 Y	<25	NA	NA	NA	<25	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	<50	NA	NA	NA	NA	NA	NA	<500 Y	<50	NA	NA	NA	<50	NA
1,2,4-Trichlorobenzene	70	99	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
1,2,4-Trimethylbenzene	63	17	µg/L	<1	NA	NA	NA	NA	NA	NA	**650 Y**	<1	NA	NA	NA	<1	NA
1,3,5-Trimethylbenzene	72	45	µg/L	<1	NA	NA	NA	NA	NA	NA	**30 Y**	<1	NA	NA	NA	<1	NA
1,2-Dichloropropane	5.0	230	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
1,3-Dichlorobenzene	6.6	28	µg/L	<1	NA	NA	NA	NA	NA	NA	<10 Y	<1	NA	NA	NA	<1	NA
Dibromochloromethane	80	- -	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA
Isopropyl benzene	800	28	µg/L	<5	NA	NA	NA	NA	NA	NA	**70 Y**	<5	NA	NA	NA	<5	NA
o-Xylene	- -	- -	µg/L	<1	NA	NA	NA	NA	NA	NA	**10 Y**	<1	NA	NA	NA	<1	NA
m&p-Xylene	- -	- -	µg/L	<2	NA	NA	NA	NA	NA	NA	**1,350 Y**	<2	NA	NA	NA	<2	NA
Total Xylenes	280	49	µg/L	<2	NA	NA	NA	NA	NA	NA	**1,360 Y**	<2	NA	NA	NA	<2	NA
Hexachloroethane	7.3	6.7	µg/L	<5	NA	NA	NA	NA	NA	NA	<50 Y	<5	NA	NA	NA	<5	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-13-48	MW-13-48	MW-13-49	MW-13-50	MW-13-51	MW-13-52	MW-13-53	MW-14-54	MW-14-55	MW-14-56	MW-14-56	MW-14-57	MW-14-58	MW-14-58
Date Collected:				06/10/20	12/07/20	06/10/20	06/04/20	06/08/20	06/04/20	06/04/20	06/09/20	06/09/20	06/08/20	12/03/20	06/09/20	06/09/20	12/04/20
Sample Name:				MW-13-48_061020	MW-13-48_120720	MW-13-49_061020	MW-13-50_060420	MW-13-51_060820	MW-13-52_060420	MW-13-53_060420	MW-14-54_060920	MW-14-55_060920	MW-14-56_060820	MW-14-56_120320	MW-14-57_060920	MW-14-58_060920	MW-14-58_120420
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.1	NA	NA	<7.1 [<7.1]
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.1	<7.1	NA	<7.1	<7.1 [<7.1]
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.1	<7.1	NA	<7.1	<7.1 [<7.1]
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.1	<7.1	NA	<7.1	<7.1 [<7.1]
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.1	NA	NA	<7.1 [<7.1]
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.1	NA	NA	<7.1 [<7.1]
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	NA	NA	<3.6 [<3.6]
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.1	<3.6	NA	<7.1	<3.6 [<3.6]
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<7.1	<3.6	NA	<7.1	<3.6 [<3.6]
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	**1.1 J**	<1.8 [<1.8]
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	**4.3 J**	**5.3**	NA	**6.2 J**	**7.1 [7.2]**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	<3.6	<1.8 [<1.8]
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	<3.6	<1.8 [<1.8]
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	<3.6	<1.8 [<1.8]
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	<3.6	<1.8 [<1.8]
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	**2.9 J**	**2.4 [2.8]**
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	**1.4 J**	**1.3 J [1.7 J]**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	**1.1 J**	NA	**4.5**	**5.1 [4.1]**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	<18	<1.8 [<1.8]
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	<3.6	<1.8 [<1.8]
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<3.6	NA	<3.6	<18 [<18]
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	<18	1.3 J [<1.8]
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	**7.1**	**4.3 [4.6]**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	<3.6	<1.8 [<1.8]
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	**5.4**	**7.8**	NA	**5.5**	**3.8 [4.1]**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	<3.6	<1.8 [<1.8]
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	<3.6	<1.8 [<1.8]
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<3.6	<1.8	NA	<3.6	<1.8 [<1.8]

See notes on last page.

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

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-14-59 06/09/20 MW-14-59_060920	MW-14-59 12/04/20 MW-14-59_120420	MW-14-60 06/09/20 MW-14-60_060920	MW-14-60 12/04/20 MW-14-60_120420	MW-14-61 03/03/20 MW-14-61_030320	MW-14-61 06/02/20 MW-14-61_060220	MW-14-61 08/31/20 MW-14-61_083120	MW-14-61 12/02/20 MW-14-61_120220	MW-14-62 06/09/20 MW-14-62_060920	MW-14-62 12/04/20 MW-14-62_120420	MW-14-63 06/08/20 MW-14-63_060820	MW-14-64 06/11/20 MW-14-64_061120	MW-14-66 06/02/20 MW-14-66_060220	MW-14-67 03/04/20 MW-14-67_030420
Field																	
Conductivity	- -	- -	mS/cm	0.67	0.58	1.27	0.92	1.35	1.97	1.84	1.83	0.56	0.41	1.20	1.77	0.87	1.17
Dissolved oxygen (DO)	- -	- -	mg/L	0.23	0.20	0.14	0.06	1.60	0.36	2.55	1.27	0.11	0.10	3.81	1.68	0.22	0.18
Oxidation reduction potential (ORP)	- -	- -	millivolts	-64.3	-11.3	-119.9	-103.7	-42.7	-45.2	117.6	31.2	-103.9	-208.7	-57.6	-76.5	-4.8	121.9
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.19	7.40	7.25	7.49	7.00	6.85	7.09	7.20	11.17	11.17	6.95	7.01	7.37	7.39
Temperature	- -	- -	Deg C	18.3	13.1	18.4	14.4	12.7	16.8	19.1	11.3	17.3	12.6	16.5	17.6	18.8	8.2
Turbidity	- -	- -	NTU	4.04	1.15	44.9	2.12	13.2	51.7	96.2	0.02	0.02	1.66	17.9	0.02	0.02	1.82
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	**1**	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	<2 [<2]	NA	<2	NA	NA	<2	NA	<2	<2	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	<10 [<10]	NA	<10	NA	NA	<10	NA	<10	<10	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	<90 [<90]	NA	<90	NA	NA	<90	NA	<90	<90	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**56 [56]**	NA	**107**	NA	**148**	**152**	**98**	**18**	**27**	NA	<1	<1	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	<50 [<50]	NA	<50	NA	NA	<50	NA	<50	<50	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	<50 [<50]	NA	<50	NA	NA	<50	NA	<50	<50	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	**4 [4]**	NA	<1	NA	NA	<1	NA	<1	**36**	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	**19 [18]**	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	<1 [<1]	NA	**5**	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	<5 [<5]	NA	**32**	NA	NA	**17**	NA	<5	<5	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	<25 [<25]	NA	<25	NA	NA	<25	NA	<25	<25	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	<50 [<50]	NA	<50	NA	NA	<50	NA	<50	<50	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	<1 [<1]	NA	<1	NA	NA	<1	NA	<1	<1	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	<2 [<2]	NA	<2	NA	NA	<2	NA	<2	<2	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	<2 [<2]	NA	<2	NA	NA	<2	NA	<2	<2	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	<5 [<5]	NA	<5	NA	NA	<5	NA	<5	<5	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-14-59 06/09/20 MW-14-59_060920	MW-14-59 12/04/20 MW-14-59_120420	MW-14-60 06/09/20 MW-14-60_060920	MW-14-60 12/04/20 MW-14-60_120420	MW-14-61 03/03/20 MW-14-61_030320	MW-14-61 06/02/20 MW-14-61_060220	MW-14-61 08/31/20 MW-14-61_083120	MW-14-61 12/02/20 MW-14-61_120220	MW-14-62 06/09/20 MW-14-62_060920	MW-14-62 12/04/20 MW-14-62_120420	MW-14-63 06/08/20 MW-14-63_060820	MW-14-64 06/11/20 MW-14-64_061120	MW-14-66 06/02/20 MW-14-66_060220	MW-14-67 03/04/20 MW-14-67_030420
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.004**	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.003	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	**0.07**	**0.05**	**0.03**	**0.15**	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	**0.6**	**0.8**	**0.5**	**0.3**	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	<7.1	NA	<7.1	NA	NA	NA	<7.1	NA	<7.1	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	<7.1 [<7.1]	<7.1	<71	<36	NA	<7.1	NA	<7.1	<6.7	<7.1	NA	NA	NA	<6.7
6:2 FTS	- -	- -	ng/L	<7.1 [<7.1]	<7.1	<71	<36	NA	<7.1	NA	<7.1	**13.4**	**22.8**	NA	NA	NA	<6.7
8:2 FTS	- -	- -	ng/L	<7.1 [<7.1]	<7.1	<7.1	<7.1	NA	<7.1	NA	<7.1	**4.2 J**	**6.5 J**	NA	NA	NA	<6.7
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	<7.1	NA	<7.1	NA	NA	NA	<7.1	NA	<7.1	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	<7.1	NA	<36	NA	NA	NA	<7.1	NA	<7.1	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	<3.6	NA	<3.6	NA	NA	NA	<3.6	NA	<3.6	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	<7.1 [<7.1]	<3.6	<7.1	<18	NA	<7.1	NA	<3.6	<6.7	**1.9 J**	NA	NA	NA	<6.7
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	<7.1 [<7.1]	<3.6	<7.1	<18	NA	<7.1	NA	<3.6	<6.7	<3.6	NA	NA	NA	<6.7
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	<3.6 [<3.6]	<1.8	<3.6	<1.8	NA	<3.6	NA	<1.8	**1.4 J**	**1.2 J**	NA	NA	NA	**1.6 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**6.6 J [6.4 J]**	**8**	**9.6**	**12.9**	NA	**1.9 J**	NA	<3.6	NA	<18	NA	NA	NA	**49.1**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	<3.6 [<3.6]	<1.8	<3.6	<1.8	NA	<3.6	NA	<1.8	<3.3	<1.8	NA	NA	NA	<3.3
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	<3.6 [<3.6]	<1.8	**1 J**	**1.7 J**	NA	<3.6	NA	<1.8	**1.7 J**	**2**	NA	NA	NA	**2.5 J**
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<3.6 [<3.6]	<1.8	<3.6	<1.8	NA	<3.6	NA	<1.8	<3.3	<1.8	NA	NA	NA	<3.3
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	<3.6 [<3.6]	<1.8	<3.6	**14.9**	NA	<3.6	NA	<1.8	**0.94 J**	**2.9**	NA	NA	NA	<3.3
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**2.1 J [1.9 J]**	**2.3**	<36	**36.5**	NA	<3.6	NA	<1.8	**13.1**	**16.6**	NA	NA	NA	**28.2**
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	<3.6 [<3.6]	**1.7 J**	<3.6	<8.9	NA	<3.6	NA	<1.8	**4.7**	**7.5**	NA	NA	NA	<3.3
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**3.2 J [3 J]**	**3.2**	**34.7 J**	**5.1 J**	NA	**1.1 J**	NA	<1.8	**12.5**	**15.4**	NA	NA	NA	**76.6**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<18 [<18]	<1.8	<3.6	<1.8	NA	<3.6	NA	<1.8	<3.3	<1.8	NA	NA	NA	<3.3
Perfluorononanoic acid (PFNA)	6	- -	ng/L	<3.6 [<3.6]	<1.8	**2.7 J**	<8.9	NA	<3.6	NA	<1.8	**5.1**	**7.3**	NA	NA	NA	**1.1 J**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	<18 [<3.6]	<18	<36	<18	NA	<3.6	NA	<3.6	**3.1 J**	<18	NA	NA	NA	<3.3
Perfluorooctanesulfonic acid (PFOS)	16	12	ng/L	<18 [<18]	<1.8	**13.2**	**5.6**	NA	<3.6	NA	<1.8	**50.2**	**75.6**	NA	NA	NA	**6.4**
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	**6.7 [6.8]**	**8.8**	**19.7 J**	**17.4**	NA	**1.4 J**	NA	**1 J**	**36.5**	**47.5**	NA	NA	NA	**11.9**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	<3.6 [<3.6]	<1.8	<3.6	**3.3**	NA	<3.6	NA	<1.8	<3.3	<1.8	NA	NA	NA	<3.3
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**2.7 J [2.6 J]**	**1.8**	**8.1**	**16.9**	NA	**3.8**	NA	**2.4**	**9.8**	**14.3**	NA	NA	NA	**74.2**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<3.6 [<3.6]	<1.8	<3.6	<1.8	NA	<3.6	NA	<1.8	<3.3	<1.8	NA	NA	NA	<3.3
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<3.6 [<3.6]	<1.8	<3.6	<1.8	NA	<3.6	NA	<1.8	<3.3	<1.8	NA	NA	NA	<3.3
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<3.6 [<3.6]	<1.8	<3.6	<1.8	NA	<3.6	NA	<1.8	<3.3	<1.8	NA	NA	NA	<3.3

See notes on last page.

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Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-14-67 06/04/20 MW-14-67_060420	MW-14-67 08/31/20 MW-14-67_083120	MW-14-67 12/02/20 MW-14-67_120220	MW-14-70 03/04/20 MW-14-70_030420	MW-14-70 06/03/20 MW-14-70_060320	MW-14-70 08/31/20 MW-14-70_083120	MW-14-70 12/02/20 MW-14-70_120220	MW-15-71 06/11/20 MW-15-71_061120	MW-15-72 03/02/20 MW-15-72_030220	MW-15-72 06/02/20 MW-15-72_060220	MW-15-72 09/01/20 MW-15-72_090120	MW-15-72 12/03/20 MW-15-72_120320	MW-15-73 06/08/20 MW-15-73_060820	MW-16-74 03/02/20 MW-16-74_030220
Field																	
Conductivity	- -	- -	mS/cm	1.69	1.34	0.43	0.95	1.35	1.31	1.67	1.49	0.86	1.40	1.09	1.32	2.88	1.71
Dissolved oxygen (DO)	- -	- -	mg/L	20.00	0.08	0.70	1.09	0.21	0.11	0.67	1.25	0.63	0.18	0.29	0.09	0.36	0.44
Oxidation reduction potential (ORP)	- -	- -	millivolts	58.3	-104.8	67.3	213.5	16.9	-109.3	39.2	45.9	-56.6	-84.5	-88.4	-93.1	-44.1	-45.7
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.23	8.13	7.75	7.31	7.23	7.19	7.13	7.00	7.07	6.90	7.05	7.01	6.76	7.04
Temperature	- -	- -	Deg C	15.3	18	8.5	8.3	16	15	12.7	14.1	13.3	17.1	21.8	12.4	19	13
Turbidity	- -	- -	NTU	2.2	1.04	9.31	1.11	2.45	1.16	8.73	6.03	24.9	50.4	14.1	17.6	79.2	27.6
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<10	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<90	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	NA	NA	NA	NA	<1	**150 Y**	**270 Y**	**90 Y**	**270 Y**	**10**	**2**
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<25	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-14-67	MW-14-67	MW-14-67	MW-14-70	MW-14-70	MW-14-70	MW-14-70	MW-15-71	MW-15-72	MW-15-72	MW-15-72	MW-15-72	MW-15-73	MW-16-74
Date Collected:				06/04/20	08/31/20	12/02/20	03/04/20	06/03/20	08/31/20	12/02/20	06/11/20	03/02/20	06/02/20	09/01/20	12/03/20	06/08/20	03/02/20
Sample Name:				MW-14-67_060420	MW-14-67_083120	MW-14-67_120220	MW-14-70_030420	MW-14-70_060320	MW-14-70_083120	MW-14-70_120220	MW-15-71_061120	MW-15-72_030220	MW-15-72_060220	MW-15-72_090120	MW-15-72_120320	MW-15-73_060820	MW-16-74_030220
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	<0.002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	<0.003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	<7.4	<7.1	NA	NA	<7.4	<7.1	NA	NA	NA	NA	<7.1	NA	NA
4:2 FTS	- -	- -	ng/L	<6.7	<7.4	<7.1	<6.9	<6.9	<7.4	<7.1	NA	NA	<8	NA	<7.1	NA	NA
6:2 FTS	- -	- -	ng/L	<6.7	<7.4	<7.1	<6.9	<6.9	<7.4	<7.1	NA	NA	<8	NA	<7.1	NA	NA
8:2 FTS	- -	- -	ng/L	<6.7	<7.4	<7.1	<6.9	<6.9	<7.4	<7.1	NA	NA	<8	NA	<7.1	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	<7.4	<7.1	NA	NA	<7.4	<7.1	NA	NA	NA	NA	<7.1	NA	NA
ADONA	- -	- -	ng/L	NA	<7.4	<7.1	NA	NA	<7.4	<7.1	NA	NA	NA	NA	<7.1	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	<9.3	<3.6	NA	NA	<9.3	<3.6	NA	NA	NA	NA	<3.6	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	<6.7	<3.7	<3.6	<6.9	<6.9	<3.7	<3.6	NA	NA	<8	NA	<3.6	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	<6.7	<3.7	<3.6	<6.9	<6.9	<3.7	<3.6	NA	NA	<8	NA	<3.6	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	**1.2 J**	**2.5**	**1.1 J**	**4.8**	**6**	**3.6**	**3.7**	NA	NA	<4	NA	<1.8	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**51**	**51.1**	**59.2**	**50.6**	**48.6**	**134**	**116**	NA	NA	**4.1 J**	NA	<3.6	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	<3.3	<1.9	<1.8	<3.4	<3.4	<1.9	<1.8	NA	NA	<4	NA	<1.8	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	**2 J**	**1.7 J**	**3.6**	<3.4	<3.4	<1.9	<1.8	NA	NA	<4	NA	<1.8	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<3.3	<1.9	<1.8	<3.4	<3.4	<1.9	<1.8	NA	NA	<4	NA	<1.8	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	<3.3	<1.9	<1.8	<3.4	<3.4	<1.9	<1.8	NA	NA	<4	NA	<1.8	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**28.1**	**32**	**42.2**	**63.2**	**62**	**101**	**107**	NA	NA	<4	NA	<1.8	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	<3.3	<1.9	<1.8	**3.1 J**	**2.4 J**	<1.9	<1.8	NA	NA	<4	NA	<1.8	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**81.6**	**86.9**	**98.4**	**98.1**	**95.7**	**298**	**279**	NA	NA	**1 J**	NA	**1.3 J**	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<3.3	<1.9	<1.8	<3.4	<3.4	<1.9	<1.8	NA	NA	<4	NA	<1.8	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	<3.3	**1.8 J**	**1.5 J**	<3.4	<3.4	<1.9	<1.8	NA	NA	<4	NA	<1.8	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	<3.3	<3.7	<3.6	<3.4	<3.4	<3.7	<3.6	NA	NA	<4	NA	<3.6	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**3.6**	**4.3**	**7.8**	<3.4	**1.3 J**	<1.9	<1.8	NA	NA	<4	NA	<1.8	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	**10.7**	**11**	**27.1**	**37.2**	**42.8**	**6.6**	**7.4**	NA	NA	<4	NA	<1.8	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	<3.3	<1.9	<1.8	<3.4	<3.4	<1.9	**1.2 J**	NA	NA	<4	NA	<1.8	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**75.5**	**71.7**	**76.8**	**155**	**129**	**449**	**426**	NA	NA	**4.1**	NA	**3.3**	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<3.3	<1.9	<1.8	<3.4	<3.4	<1.9	<1.8	NA	NA	<4	NA	<1.8	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<3.3	<1.9	<1.8	<3.4	<3.4	<1.9	<1.8	NA	NA	<4	NA	<1.8	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<3.3	<1.9	<1.8	<3.4	<3.4	<1.9	<1.8	NA	NA	<4	NA	<1.8	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-16-74	MW-16-74	MW-16-74	MW-16-75	MW-16-75	MW-16-76	MW-16-77	MW-16-77	MW-16-78	MW-16-78	MW-16-79	MW-16-79	MW-16-80	MW-16-80
Date Collected:				06/05/20	09/01/20	12/01/20	06/08/20	12/04/20	06/08/20	06/08/20	12/04/20	06/09/20	12/07/20	06/09/20	12/07/20	06/08/20	12/04/20
Sample Name:				MW-16-74_060520	MW-16-74_090120	MW-16-74_120120	MW-16-75_060820	MW-16-75_120420	MW-16-76_060820	MW-16-77_060820	MW-16-77_120420	MW-16-78_060920	MW-16-78_120720	MW-16-79_060920	MW-16-79_120720	MW-16-80_060820	MW-16-80_120420
Field																	
Conductivity	- -	- -	mS/cm	2.04	1.57	2.01	2.15	2.11	1.95	2.14	2.24	1.81	1.73	0.94	0.82	1.25	1.88
Dissolved oxygen (DO)	- -	- -	mg/L	0.49	0.15	0.62	0.32	0.06	0.29	0.74	0.26	0.26	0.14	0.79	0.34	1.31	0.19
Oxidation reduction potential (ORP)	- -	- -	millivolts	-7.9	-6.1	-45.1	-38.5	-88.6	-31.8	-69.2	-60.9	-63.4	-62.4	-70.9	-78.8	-29.1	-67.5
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.98	7.07	7.11	7.07	7.11	7.18	7.13	7.17	6.95	6.99	7.14	7.24	7.08	6.71
Temperature	- -	- -	Deg C	16.3	15.5	12.1	16.1	12	14	18.8	11.1	18.4	11.2	19.2	11	16.6	9.4
Turbidity	- -	- -	NTU	19.3	1.98	578	65.2	456	10.9	32.9	0.02	6.22	0.02	50.7	7.76	9.91	23.6
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**2**	**3**	<1	**2**	<1	**2**	<1	<1	<1	<1 [<1]	<1	<1	**7**	**28**
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-16-74	MW-16-74	MW-16-74	MW-16-75	MW-16-75	MW-16-76	MW-16-77	MW-16-77	MW-16-78	MW-16-78	MW-16-79	MW-16-79	MW-16-80	MW-16-80
Date Collected:				06/05/20	09/01/20	12/01/20	06/08/20	12/04/20	06/08/20	06/08/20	12/04/20	06/09/20	12/07/20	06/09/20	12/07/20	06/08/20	12/04/20
Sample Name:				MW-16-74_060520	MW-16-74_090120	MW-16-74_120120	MW-16-75_060820	MW-16-75_120420	MW-16-76_060820	MW-16-77_060820	MW-16-77_120420	MW-16-78_060920	MW-16-78_120720	MW-16-79_060920	MW-16-79_120720	MW-16-80_060820	MW-16-80_120420
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Monitoring Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-16-81 03/02/20 MW-16-81_030220	MW-16-81 06/05/20 MW-16-81_060520	MW-16-81 06/09/20 MW-16-81_060920	MW-16-81 09/02/20 MW-16-81_090220	MW-16-81 12/03/20 MW-16-81_120320	MW-16-82 06/10/20 MW-16-82_061020	MW-16-82 12/04/20 MW-16-82_120420	MW-16-83 06/08/20 MW-16-83_060820	MW-16-84 03/04/20 MW-16-84_030420	MW-16-84 06/04/20 MW-16-84_060420	MW-16-84 09/01/20 MW-16-84_090120	MW-16-84 12/01/20 MW-16-84_120120	MW-16-85 06/08/20 MW-16-85_060820	MW-16-85 12/04/20 MW-16-85_120420
Field																	
Conductivity	- -	- -	mS/cm	1.31	1.65	1.37	2.70	3.23	1.20	0.79	4.14	0.98	1.35	1.36	1.32	1.11	0.60
Dissolved oxygen (DO)	- -	- -	mg/L	0.40	0.26	0.01	0.16	0.23	0.36	0.27	0.40	0.21	0.63	0.39	0.10	0.48	0.40
Oxidation reduction potential (ORP)	- -	- -	millivolts	-72.2	-81.3	-86.3	-50.9	-13	-102.3	-75.9	-65.6	13.2	-30.8	-61.1	-88	-34.9	-72.6
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.07	7.05	6.97	6.78	6.75	7.09	7.05	6.89	7.10	7.08	7.13	7.15	7.25	7.22
Temperature	- -	- -	Deg C	13.6	18.7	15.5	16.6	12.4	21.5	7.3	22.4	12.1	15.4	18.2	11.6	15.8	6.8
Turbidity	- -	- -	NTU	22.9	19.7	2.19	2.61	0.02	0.02	47.8	47.6	12	23.6	17.2	41.4	125	24.9
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Acrylonitrile	2.6	2	µg/L	NA	<2	NA	NA	NA	NA	NA	NA	NA	<2 [<2]	NA	NA	<2	NA
Bromobenzene	18	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Chlorobromomethane	- -	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
Dibromomethane	80	- -	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
Ethyl ether	10	- -	µg/L	NA	<10	NA	NA	NA	NA	NA	NA	NA	<10 [<10]	NA	NA	<10	NA
Iodomethane	- -	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
N-Butylbenzene	80	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
N-Propylbenzene	80	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
tert-Butylbenzene	80	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Tetrahydrofuran	95	11,000	µg/L	NA	<90	NA	NA	NA	NA	NA	NA	NA	<90 [<90]	NA	NA	<90	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
1,4-Dioxane	7.2	280	µg/L	**2,600 Y [2,700 Y]**	**3,100 Y [2,700 Y]**	NA	**500 Y [590 Y]**	**1,930 Y [1,070 Y]**	<1	<1	<1	**66**	**58 [58]**	**57**	**81**	**8**	**8**
1,1,1-Trichloroethane	200	89	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
2-Hexanone	1,000	- -	µg/L	NA	<50	NA	NA	NA	NA	NA	NA	NA	<50 [<50]	NA	NA	<50	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Acetone	730	1,700	µg/L	NA	<50	NA	NA	NA	NA	NA	NA	NA	<50 [<50]	NA	NA	<50	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Bromodichloromethane	80	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
1,1-Dichloroethane	880	740	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Bromoform	80	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Carbon disulfide	800	- -	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
Carbon tetrachloride	5.0	38	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Chlorobenzene	100	25	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Trichloroethene	5.0	200	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
Tetrachloroethene	5.0	60	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Vinyl chloride	2.0	13	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
2-Methylnaphthalene	260	19	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
Chloroethane	430	1,100	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
Benzene	5.0	200	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Ethylbenzene	74	18	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Methylene chloride	5.0	1,500	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
Styrene	100	80	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Toluene	790	270	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Naphthalene	520	11	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	<25	NA	NA	NA	NA	NA	NA	NA	<25 [<25]	NA	NA	<25	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	<50	NA	NA	NA	NA	NA	NA	NA	<50 [<50]	NA	NA	<50	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
Dibromochloromethane	80	- -	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
Isopropyl benzene	800	28	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA
o-Xylene	- -	- -	µg/L	NA	<1	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	<1	NA
m&p-Xylene	- -	- -	µg/L	NA	<2	NA	NA	NA	NA	NA	NA	NA	<2 [<2]	NA	NA	<2	NA
Total Xylenes	280	49	µg/L	NA	<2	NA	NA	NA	NA	NA	NA	NA	<2 [<2]	NA	NA	<2	NA
Hexachloroethane	7.3	6.7	µg/L	NA	<5	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	<5	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Monitoring Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential	P201 Groundwater Surface Water		MW-16-81	MW-16-81	MW-16-81	MW-16-81	MW-16-81	MW-16-82	MW-16-82	MW-16-83	MW-16-84	MW-16-84	MW-16-84	MW-16-84	MW-16-85	MW-16-85
Date Collected:				03/02/20	06/05/20	06/09/20	09/02/20	12/03/20	06/10/20	12/04/20	06/08/20	03/04/20	06/04/20	09/01/20	12/01/20	06/08/20	12/04/20
Sample Name:	Drinking Water	Interface	Units	MW-16-81_030220	MW-16-81_060520	MW-16-81_060920	MW-16-81_090220	MW-16-81_120320	MW-16-82_061020	MW-16-82_120420	MW-16-83_060820	MW-16-84_030420	MW-16-84_060420	MW-16-84_090120	MW-16-84_120120	MW-16-85_060820	MW-16-85_120420
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	<36	NA	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	<7.1	NA	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	<7.1	NA	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	<3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	<7.1	NA	<3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	<7.1	NA	<3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	**2.9 J**	NA	**2.9 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	<18	NA	**2.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	<3.6	NA	<3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	<3.6	NA	**1.5 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	**7.6**	NA	**3.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	<3.6	NA	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-17-86 03/04/20 MW-17-86_030420	MW-17-86 06/03/20 MW-17-86_060320	MW-17-86 09/01/20 MW-17-86_090120	MW-17-86 12/01/20 MW-17-86_120120	MW-17-87* 06/05/20 MW-17-87_060520	MW-18-88 03/02/20 MW-18-88_030220	MW-18-88 06/04/20 MW-18-88_060420	MW-18-88 06/09/20 MW-18-88_060920	MW-18-88 08/27/20 MW-18-88_082720	MW-18-88 12/07/20 MW-18-88_120720	MW-18-89 03/03/20 MW-18-89_030320	MW-18-89 06/08/20 MW-18-89_060820	MW-18-89 08/27/20 MW-18-89_082720	MW-18-89 12/08/20 MW-18-89_120820
Field																	
Conductivity	- -	- -	mS/cm	1.23	1.77	1.82	1.75	3.57	0.44	0.51	0.65	0.62	0.47	0.42	0.60	0.71	0.62
Dissolved oxygen (DO)	- -	- -	mg/L	0.15	2.12	0.53	0.11	3.00	0.03	0.27	0.14	0.15	0.10	0.15	0.66	0.06	0.57
Oxidation reduction potential (ORP)	- -	- -	millivolts	-25.4	-60.3	-63.4	-83.7	-162.1	67.7	2.1	32.9	-218	75	177.1	41.2	-154.8	144.1
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.99	6.82	6.97	6.97	7.11	7.17	4.80	7.04	7.07	6.95	8.03	7.86	7.98	7.80
Temperature	- -	- -	Deg C	11.9	18.3	19.4	11.9	24.7	6.5	14.8	19.7	21.7	11.4	6.5	18.1	22	11.9
Turbidity	- -	- -	NTU	0.76	144	63.8	0.02	9.68	1.66	1.64	0.02	2.3	1.64	1.48	0.22	1.49	1.51
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	<2	NA	<2	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	<10	NA	<10	NA	NA	NA	<10	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	<90	NA	<90	NA	NA	NA	<90	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**99**	**94**	**88**	**106**	**1.5***	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	<50	NA	<50	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	<50	NA	<50	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	**19**	NA	**12**	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	<25	NA	<25	NA	NA	NA	<25	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	<50	NA	<50	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	<2	NA	<2	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	<2	NA	<2	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	<5	NA	<5	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
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2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-17-86 03/04/20 MW-17-86_030420	MW-17-86 06/03/20 MW-17-86_060320	MW-17-86 09/01/20 MW-17-86_090120	MW-17-86 12/01/20 MW-17-86_120120	MW-17-87* 06/05/20 MW-17-87_060520	MW-18-88 03/02/20 MW-18-88_030220	MW-18-88 06/04/20 MW-18-88_060420	MW-18-88 06/09/20 MW-18-88_060920	MW-18-88 08/27/20 MW-18-88_082720	MW-18-88 12/07/20 MW-18-88_120720	MW-18-89 03/03/20 MW-18-89_030320	MW-18-89 06/08/20 MW-18-89_060820	MW-18-89 08/27/20 MW-18-89_082720	MW-18-89 12/08/20 MW-18-89_120820
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.002	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.01	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.003	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<6.9	<7.1	NA	NA	<6.9	<7.1
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	<7.4	<7.1 [<7.1]	NA	<6.9	<7.1	<7.4	<7.1	<6.9	<7.1
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	<7.4	<7.1 [<7.1]	NA	<6.9	<7.1	<7.4	<7.1	<6.9	<7.1
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	<7.4	<7.1 [<7.1]	NA	<6.9	<7.1	<7.4	<7.1	<6.9	<7.1
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<6.9	<7.1	NA	NA	<6.9	<7.1
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<6.9	<7.1	NA	NA	<6.9	<7.1
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<8.6	<3.6	NA	NA	<8.6	<3.6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	<7.4	<7.1 [<7.1]	NA	<3.4	<3.6	<7.4	<7.1	<3.4	<3.6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	<7.4	<7.1 [<7.1]	NA	<3.4	<3.6	<7.4	<7.1	<3.4	<3.6
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	NA	NA	NA	**2 J**	**1.9 J [1.9 J]**	NA	**2.1**	**1.7 J**	<3.7	**0.94 J**	**1 J**	**1.6 J**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	**4.8 J**	**6.4 J [6.2 J]**	NA	**10.2**	**8.3**	**9.7**	**9.1**	**12.3**	**12.9**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	<1.7	<1.8	<3.7	<3.6	**1 J**	**1.4 J**
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	<1.7	<1.8	**1.1 J**	<18	**1.7**	**1.1 J**
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	<1.7	<1.8	<3.7	<3.6	<1.7	<1.8
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	**1.3 J [1.2 J]**	NA	**3**	**2.3**	**2.5 J**	**3.2 J**	**4.2**	**5.1**
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	**1.2 J**	<1.8	**4.8**	**4.9**	**5.2**	**5.8**
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	NA	NA	NA	**1.5 J**	**1.9 J [2.1 J]**	NA	**3.6**	**3.6**	**3.5 J**	**4.6**	**5.1**	**7.2**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	**1 J**	<1.8	**5.2**	**6.7**	**8**	**7.6**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	<1.7	<1.8	<3.7	<18	<1.7	<1.8
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	<1.7	<1.8	**0.99 J**	**1.2 J**	**1.2 J**	**1.5 J**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	<3.4	<3.6	<3.7	<18	<3.4	<18
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	**46.1**	**78.2 [78.3]**	NA	**271**	**155**	**120**	**150**	**170**	**176**
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	NA	NA	NA	**3.1 J**	**4.1 [4.2]**	NA	**8.8**	**6.1**	**10.1**	**14.1**	**15**	**17.1**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	<1.7	<1.8	<3.7	<3.6	<1.7	**2.4**
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	<1.7	<1.8	**8.2**	**8.5**	**8.2**	**9.3**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	<1.7	<1.8	<3.7	<18	<1.7	<1.8
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	<1.7	<1.8	<3.7	<18	<1.7	<1.8
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	<3.7	<3.6 [<3.6]	NA	<1.7	<1.8	<3.7	<3.6	<1.7	<1.8

See notes on last page.

Table 2
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RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-18-90 03/03/20 MW-18-90_030320	MW-18-90 06/05/20 MW-18-90_060520	MW-18-90 08/27/20 MW-18-90_082720	MW-18-90 12/07/20 MW-18-90_120720	MW-18-91 03/02/20 MW-18-91_030220	MW-18-91 06/05/20 MW-18-91_060520	MW-18-91 08/27/20 MW-18-91_082720	MW-18-91 12/07/20 MW-18-91_120720	MW-18-92 06/03/20 MW-18-92_060320	MW-18-92 12/01/20 MW-18-92_120120	MW-18-93 06/05/20 MW-18-93_060520	MW-18-93 12/07/20 MW-18-93_120720	MW-18-94 06/08/20 MW-18-94_060820	MW-18-94 12/07/20 MW-18-94_120720
Field																	
Conductivity	- -	- -	mS/cm	1.81	2.30	1.96	1.74	0.48	0.74	0.77	0.52	1.07	1.00	0.50	0.45	3.66	4.00
Dissolved oxygen (DO)	- -	- -	mg/L	0.41	0.16	0.22	0.44	0.07	0.16	0.15	0.15	0.35	5.48	2.03	8.51	0.01	0.01
Oxidation reduction potential (ORP)	- -	- -	millivolts	121.5	-192.3	-280.1	-187.9	104.4	-196.4	-178.7	69.8	-23.6	0.3	-112.2	-165.3	-87.8	-136.3
pH	6.5 to 8.5	6.5 to 9.0	s.u.	12.48	12.30	12.28	12.12	7.75	7.84	7.65	7.55	6.85	6.95	7.26	7.51	6.97	7.03
Temperature	- -	- -	Deg C	10.7	14	18.5	13.2	7.6	16.4	21.3	11.6	12.3	11.6	14	10.1	14.1	10.9
Turbidity	- -	- -	NTU	1.22	4.14	1.55	1.21	1.76	7.7	1.34	1.63	1.8	2.18	3.34	5.87	1.97	9.62
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2**	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:				MW-18-90	MW-18-90	MW-18-90	MW-18-90	MW-18-91	MW-18-91	MW-18-91	MW-18-91	MW-18-92	MW-18-92	MW-18-93	MW-18-93	MW-18-94	MW-18-94
Date Collected:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	03/03/20	06/05/20	08/27/20	12/07/20	03/02/20	06/05/20	08/27/20	12/07/20	06/03/20	12/01/20	06/05/20	12/07/20	06/08/20	12/07/20
Sample Name:				MW-18-90_030320	MW-18-90_060520	MW-18-90_082720	MW-18-90_120720	MW-18-91_030220	MW-18-91_060520	MW-18-91_082720	MW-18-91_120720	MW-18-92_060320	MW-18-92_120120	MW-18-93_060520	MW-18-93_120720	MW-18-94_060820	MW-18-94_120720
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	<6.9	<7.1	NA	NA	<6.9	<7.1	NA	<7.1	NA	<7.1	NA	<7.1
4:2 FTS	- -	- -	ng/L	<7.4	<7.1	<6.9	<7.1	<7.4	<7.1	<6.9	<7.1	<6.9	<7.1	<7.1	<7.1	<7.1	<7.1
6:2 FTS	- -	- -	ng/L	<7.4	<7.1	<6.9	<7.1	<7.4	<7.1	<6.9	<7.1	<6.9	<7.1	<7.1	<7.1	<7.1	<7.1
8:2 FTS	- -	- -	ng/L	<7.4	<7.1	<6.9	<7.1	<7.4	<7.1	<6.9	<7.1	<6.9	<7.1	<7.1	<7.1	<7.1	<7.1
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	<6.9	<7.1	NA	NA	<6.9	<7.1	NA	<7.1	NA	<7.1	NA	<7.1
ADONA	- -	- -	ng/L	NA	NA	<6.9	<7.1	NA	NA	<6.9	<7.1	NA	<7.1	NA	<7.1	NA	<7.1
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	<8.6	<3.6	NA	NA	<8.6	<3.6	NA	<3.6	NA	<3.6	NA	<3.6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	<7.4	<7.1	<3.4	<3.6	<7.4	<7.1	<3.4	<3.6	<6.9	<3.6	<7.1	<3.6	<7.1	<3.6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	<7.4	<7.1	<3.4	<3.6	<7.4	<7.1	<3.4	<3.6	<6.9	<3.6	<7.1	<3.6	<7.1	<3.6
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	**7.1**	**2.2 J**	**2.3**	<1.8	**1.9 J**	**1.4 J**	<1.7	<1.8	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**7.8**	**11.1**	**11.3**	**9.9**	**8.9**	**7.5**	**9.2**	**7.8**	<6.9	<3.6	<7.1	<3.6	<7.1	**2.8 J**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	<3.7	<3.6	<1.7	<1.8	**4.7**	**4.6**	**9.7**	**6.7**	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	**1.3 J**	**1.3 J**	**1.6 J**	**1.5 J**	<3.7	**1 J**	**1.2 J**	**1.1 J**	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<3.7	<3.6	<1.7	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	**36.2**	**30.9**	**33.2**	**33.6**	<3.7	<3.6	**2.1**	**1.6 J**	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**3.5 J**	**3 J**	**5.5**	**4.2**	**4**	**2.8 J**	**4.3**	**2.3**	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	**20.4**	**18.2**	**18.1**	**19**	**1.8 J**	**1.7 J**	**1.7**	**1.5 J**	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**3.5 J**	**3.8**	**7.4**	**7**	**3.3 J**	**3.5 J**	**3.9**	**2.5**	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<3.7	<3.6	<1.7	<1.8	<3.7	<18	<1.7	<1.8	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluorononanoic acid (PFNA)	6	- -	ng/L	**1.1 J**	**1.3 J**	**1.4 J**	**1.6 J**	**1.1 J**	**1.5 J**	**1.4 J**	**1.1 J**	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	<3.7	**1.1 J**	<3.4	<3.6	<3.7	<3.6	<17	<18	<3.4	<3.6	<3.6	<3.6	<3.6	<3.6
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**920**	**932**	**1,010**	**1,060**	**47.1**	**51.6**	**64.5**	**60.7**	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	**12.6**	**13.3**	**15.9**	**17.8**	**7.9**	**8.2**	**10**	**8.7**	<3.4	**1.1 J**	<3.6	<1.8	<3.6	<1.8
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	**2.9 J**	**2.3 J**	**2.5**	**2.2**	<3.7	<3.6	**0.87 J**	**1.7 J**	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**4.5**	**3.4 J**	**4.9**	**5.3**	**3.8**	**4.9**	**4.7**	**2.9**	<3.4	<1.8	<3.6	<1.8	<3.6	**1.4 J**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<3.7	<3.6	<1.7	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<3.7	<3.6	<1.7	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<3.7	<3.6	<1.7	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<1.8	<3.6	<1.8	<3.6	<1.8

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

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-18-95 03/02/20 MW-18-95_030220	MW-18-95 06/05/20 MW-18-95_060520	MW-18-95 08/28/20 MW-18-95_082820	MW-18-95 12/07/20 MW-18-95_120720	MW-18-96 06/02/20 MW-18-96_060220	MW-18-97 06/08/20 MW-18-97_060820	MW-18-97 12/07/20 MW-18-97_120720	MW-18-98 03/02/20 MW-18-98_030220	MW-18-98 06/03/20 MW-18-98_060320	MW-18-98 08/27/20 MW-18-98_082720	MW-18-98 12/01/20 MW-18-98_120120	MW-18-99 03/02/20 MW-18-99_030220	MW-18-99 06/02/20 MW-18-99_060220	MW-18-99 08/27/20 MW-18-99_082720
Field																	
Conductivity	- -	- -	mS/cm	0.31	0.54	0.60	0.43	0.55	1.51	1.12	0.42	0.53	0.70	0.57	1.30	1.75	2.49
Dissolved oxygen (DO)	- -	- -	mg/L	6.70	1.03	0.42	1.37	5.40	0.32	0.06	0.05	0.29	0.11	0.16	0.01	2.67	0.12
Oxidation reduction potential (ORP)	- -	- -	millivolts	132	-0.2	98.6	101	54.1	-65.2	-128.9	59.1	-76.1	-147.9	4.3	195.3	-124.1	-162
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.82	7.59	7.29	7.34	7.27	6.76	7.02	7.41	6.99	7.22	7.27	8.24	7.80	7.65
Temperature	- -	- -	Deg C	6	15.5	21.8	10.7	16.1	14.2	9.3	7.4	13.9	20.8	11	8.4	15.8	21.3
Turbidity	- -	- -	NTU	1.44	1.53	7.48	1.3	2.01	1.41	5.02	1.17	2.02	2.08	1.15	1.79	2.56	1.32
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	NA [NA]	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential	P201 Groundwater Surface Water		MW-18-95	MW-18-95	MW-18-95	MW-18-95	MW-18-96	MW-18-97	MW-18-97	MW-18-98	MW-18-98	MW-18-98	MW-18-98	MW-18-99	MW-18-99	MW-18-99
Date Collected:	Drinking Water	Interface	Units	03/02/20	06/05/20	08/28/20	12/07/20	06/02/20	06/08/20	12/07/20	03/02/20	06/03/20	08/27/20	12/01/20	03/02/20	06/02/20	08/27/20
Sample Name:				MW-18-95_030220	MW-18-95_060520	MW-18-95_082820	MW-18-95_120720	MW-18-96_060220	MW-18-97_060820	MW-18-97_120720	MW-18-98_030220	MW-18-98_060320	MW-18-98_082720	MW-18-98_120120	MW-18-99_030220	MW-18-99_060220	MW-18-99_082720
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA [NA]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	<6.9 [<6.9]	<7.7 [<7.4]	NA	NA	<7.1	NA	NA	<6.9	<7	NA	NA	<6.9
4:2 FTS	- -	- -	ng/L	<6.9 [<7.4]	<7.1	<6.9 [<6.9]	<7.7 [<7.4]	<13	<7.1	<7.1	<7.4	<6.9	<6.9	<7	<7.4	<7.4	<6.9
6:2 FTS	- -	- -	ng/L	<6.9 [<7.4]	<7.1	<6.9 [<6.9]	<7.7 [<7.4]	<13	<7.1	<7.1	<7.4	<6.9	<6.9	<7	<7.4	<7.4	<6.9
8:2 FTS	- -	- -	ng/L	<6.9 [<7.4]	<7.1	<6.9 [<6.9]	<7.7 [<7.4]	<13	<7.1	<7.1	<7.4	<6.9	<6.9	<7	<7.4	<7.4	<6.9
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	<6.9 [<6.9]	<7.7 [<7.4]	NA	NA	<7.1	NA	NA	<6.9	<7	NA	NA	<6.9
ADONA	- -	- -	ng/L	NA	NA	<6.9 [<6.9]	<7.7 [<7.4]	NA	NA	<7.1	NA	NA	<6.9	<7	NA	NA	<6.9
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	<8.6 [<8.6]	<3.8 [<3.7]	NA	NA	<3.6	NA	NA	<8.6	<3.5	NA	NA	<8.6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	<6.9 [<7.4]	<7.1	<3.4 [<3.4]	<3.8 [<3.7]	<13	<7.1	<3.6	<7.4	<6.9	<3.4	<3.5	<7.4	<7.4	<3.4
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	<6.9 [<7.4]	<7.1	<3.4 [<3.4]	<3.8 [<3.7]	<13	<7.1	<3.6	<7.4	<6.9	<3.4	<3.5	<7.4	<7.4	<3.4
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	**4.8 [4.1]**	**1.3 J**	**1.6 J [1.8]**	**2 [1.9]**	<6.3	<3.6	<1.8	**2 J**	**2.1 J**	**3**	**1.9**	<3.7	<3.7	<1.7
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**5.8 J [5.2 J]**	**7.6**	**11.3 [10.7]**	**5.9 [6]**	<13	<7.1	<3.6	**6.2 J**	**14.8**	**62.6**	**17.9**	**11.9**	**15**	**14.2**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	**2 J [2 J]**	**1.8 J**	<1.7 [1.1 J]	<1.9 [<1.9]	<6.3	<3.6	<1.8	<3.7	<3.4	<1.7	<1.8	<3.7	<3.7	<1.7
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	<3.4 [<3.7]	<3.6	<1.7 [<1.7]	<1.9 [<1.9]	<6.3	<3.6	<1.8	<3.7	<3.4	<1.7	<1.8	<3.7	<3.7	<1.7
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<3.4 [<3.7]	<3.6	<1.7 [<1.7]	<1.9 [<1.9]	<6.3	<3.6	<1.8	<3.7	<3.4	<1.7	<1.8	<3.7	<3.7	<1.7
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	<3.4 [<3.7]	<3.6	**0.97 J [1.2 J]**	0.98 J [<1.9]	<6.3	<3.6	<1.8	**1.3 J**	**1.4 J**	**2.4**	**1.7 J**	<3.7	**1.7 J**	**2.3**
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**1.7 J [1.3 J]**	<3.6	**1 J [0.93 J]**	**1.5 J [1.2 J]**	<6.3	<3.6	<1.8	**2.4 J**	**5.1**	**12.5**	**10.4**	**2 J**	**3 J**	**4.2**
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	<3.4 [<3.7]	<3.6	**1.1 J [1.5 J]**	**1.3 J [1.5 J]**	<6.3	<3.6	<1.8	**0.99 J**	**1.3 J**	**2.4**	**1.4 J**	**1.1 J**	**1.8 J**	**2.6**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**2.2 J [1.3 J]**	<3.6	**1.3 J [0.93 J]**	**1.2 J [1.3 J]**	**1.6 J**	<3.6	<1.8	**3.3 J**	**8.1**	**28.7**	**14.3**	**2.2 J**	**3.8**	**4.2**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<3.4 [<3.7]	<3.6	<1.7 [<1.7]	<1.9 [<1.9]	<6.3	<3.6	<1.8	<3.7	<3.4	<1.7	<1.8	<3.7	<3.7	<1.7
Perfluorononanoic acid (PFNA)	6	- -	ng/L	<3.4 [<3.7]	**0.9 J**	0.95 J [<1.7]	1.3 J [<1.9]	<6.3	<3.6	<1.8	<3.7	**0.93 J**	**0.99 J**	**1.9**	<3.7	**1.3 J**	**0.99 J**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	<3.4 [<3.7]	<3.6	<3.4 [<3.4]	<3.8 [<3.7]	<6.3	<3.6	<3.6	<3.7	<3.4	<3.4	<3.5	<3.7	<3.7	<3.4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**38.1 [38.5]**	**37.3**	**46.6 [49.1]**	**39 [39.2]**	<6.3	<3.6	<1.8	**75.2**	**80**	**105**	**80.9**	**46.7**	**62.1**	**81.2**
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	**4.1 [3.5 J]**	**3.7**	**6.3 [5.6]**	**4.9 [4.9]**	<6.3	<3.6	<1.8	**9.4**	**17.1**	**26.3**	**31.4**	**3.9**	**6.9**	**8.6**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	<3.4 [<3.7]	<3.6	<1.7 [<1.7]	<1.9 [1.4 J]	<6.3	<3.6	<1.8	<3.7	<3.4	<1.7	<1.8	<3.7	<3.7	<1.7
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**2.9 J [2.6 J]**	<3.6	**1.1 J [1.1 J]**	<1.9 [1.4 J]	<6.3	<3.6	<1.8	**3.7**	**8.7**	**24.8**	**11.4**	**3.1 J**	**3.3 J**	**5.4**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<3.4 [<3.7]	<3.6	<1.7 [<1.7]	<1.9 [<1.9]	<6.3	<3.6	<8.9	<3.7	<3.4	<1.7	<1.8	<3.7	<3.7	<1.7
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<3.4 [<3.7]	<3.6	<1.7 [<1.7]	<1.9 [<1.9]	<6.3	<3.6	<8.9	<3.7	<3.4	<1.7	<1.8	<3.7	<3.7	<1.7
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<3.4 [<3.7]	<3.6	<1.7 [<1.7]	<1.9 [<1.9]	<6.3	<3.6	<1.8	<3.7	<3.4	<1.7	<1.8	<3.7	<3.7	<1.7

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-18-99 12/02/20 MW-18-99_120220	MW-18-100 06/03/20 MW-18-100_060320	MW-18-100 12/01/20 MW-18-100_120120	MW-18-101 06/05/20 MW-18-101_060520	MW-18-101 12/07/20 MW-18-101_120720	MW-18-102 06/02/20 MW-18-102_060220	MW-18-102 12/02/20 MW-18-102_120220	MW-18-103 03/03/20 MW-18-103_030320	MW-18-103 06/04/20 MW-18-103_060420	MW-18-103 08/28/20 MW-18-103_082820	MW-18-103 12/07/20 MW-18-103_120720	MW-18-104 03/04/20 MW-18-104_030420	MW-18-104 06/02/20 MW-18-104_060220	MW-18-104 12/02/20 MW-18-104_120220
Field																	
Conductivity	- -	- -	mS/cm	2.07	0.39	0.72	1.52	1.78	0.49	0.51	0.43	0.48	0.69	0.57	0.41	0.49	0.46
Dissolved oxygen (DO)	- -	- -	mg/L	0.09	5.23	1.41	1.37	0.33	2.50	0.21	1.45	1.68	0.63	0.63	0.42	0.50	3.12
Oxidation reduction potential (ORP)	- -	- -	millivolts	-64.5	38	-10.7	-120.7	-172.6	69.5	5.1	99.9	52.5	161.4	103.3	67.9	-7.8	105.4
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.93	7.60	7.69	6.85	6.98	6.94	7.32	7.16	6.96	7.05	6.67	7.29	7.08	7.35
Temperature	- -	- -	Deg C	13.1	13.8	13.1	13.3	0.9	11.3	12.2	6.1	12	16.6	10	6.6	13.5	10.9
Turbidity	- -	- -	NTU	1.22	1.78	22.9	1.56	53.7	1.41	1.94	2.06	1.81	37.4	1.22	1.3	1.61	1.26
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-18-99 12/02/20 MW-18-99_120220	MW-18-100 06/03/20 MW-18-100_060320	MW-18-100 12/01/20 MW-18-100_120120	MW-18-101 06/05/20 MW-18-101_060520	MW-18-101 12/07/20 MW-18-101_120720	MW-18-102 06/02/20 MW-18-102_060220	MW-18-102 12/02/20 MW-18-102_120220	MW-18-103 03/03/20 MW-18-103_030320	MW-18-103 06/04/20 MW-18-103_060420	MW-18-103 08/28/20 MW-18-103_082820	MW-18-103 12/07/20 MW-18-103_120720	MW-18-104 03/04/20 MW-18-104_030420	MW-18-104 06/02/20 MW-18-104_060220	MW-18-104 12/02/20 MW-18-104_120220
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	<7.1	NA	<7	NA	<7.1	NA	<7.1	NA	NA	<6.9	<7.1	NA	NA	<7
4:2 FTS	- -	- -	ng/L	<7.1	<6.9	<7	<8	<7.1	<6.9	<7.1	<7.4	<7.1	<6.9	<7.1	<6.9	<6.9	<7
6:2 FTS	- -	- -	ng/L	<7.1	<6.9	<7	<8	<7.1	<6.9	<7.1	<7.4	<7.1	<6.9	<7.1	<6.9	<6.9	<7
8:2 FTS	- -	- -	ng/L	<7.1	<6.9	<7	<8	<7.1	<6.9	<7.1	<7.4	<7.1	<6.9	<7.1	<6.9	<6.9	<7
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	<7.1	NA	<7	NA	<7.1	NA	<7.1	NA	NA	<6.9	<7.1	NA	NA	<7
ADONA	- -	- -	ng/L	<7.1	NA	<7	NA	<7.1	NA	<7.1	NA	NA	<6.9	<7.1	NA	NA	<7
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	<3.6	NA	<3.5	NA	<3.6	NA	<3.6	NA	NA	<8.6	<3.6	NA	NA	<3.5
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	<3.6	<6.9	<3.5	<8	<3.6	<6.9	<3.6	<7.4	<7.1	<3.4	<3.6	<6.9	<6.9	<3.5
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	<3.6	<6.9	<3.5	<8	<3.6	<6.9	<3.6	<7.4	<7.1	<3.4	<3.6	<6.9	<6.9	<3.5
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	<1.8	<3.4	**1.5 J**	<4	<1.8	<3.4	<1.8	**4.1**	**2.2 J**	**5.4**	**9.7**	**1.6 J**	**2 J**	<1.8
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**16**	**6.9**	**7.1**	<8	**2.2 J**	<6.9	<3.6	<7.4	<7.1	**2.5 J**	**9.4**	<6.9	<6.9	<3.5
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	<1.8	<3.4	<1.8	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<3.4	<1.8
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	**1.1 J**	<3.4	<1.8	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<3.4	<1.8
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<1.8	<3.4	<1.8	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<3.4	<1.8
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	**3**	<3.4	<1.8	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<3.4	<1.8
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	**3.7**	**1.8 J**	**1.1 J**	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<3.4	<1.8
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	**3.2**	**3.5**	**4**	<4	<1.8	<3.4	<1.8	**16.8**	**17.4**	**38**	**61.8**	**1.6 J**	**1.5 J**	<1.8
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	**4.8**	**3.1 J**	**2.2**	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	**2.1**	<3.4	<3.4	<1.8
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<1.8	<3.4	<1.8	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<3.4	<1.8
Perfluorononanoic acid (PFNA)	6	- -	ng/L	**2.2**	<3.4	<1.8	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<3.4	<1.8
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	<18	<3.4	<3.5	<4	<3.6	<3.4	<3.6	<3.7	<3.6	<3.4	<3.6	<3.4	<3.4	<3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**130**	**4.3**	**1.4 J**	<4	<1.8	<3.4	<1.8	**2 J**	<3.6	**5.2**	**4.6**	**6.5**	**6**	**5.5**
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	**9.8**	**4.1**	**2.3**	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	**0.9 J**	**1.4 J**	**1.5 J**	<1.8
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	<1.8	<3.4	<1.8	<4	<1.8	<3.4	<1.8	**2.7 J**	**2.2 J**	**4.1**	**7**	<3.4	<3.4	<1.8
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**4.7**	**2.2 J**	**2.1**	**1.7 J**	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	**2.7**	<3.4	<3.4	<1.8
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<8.9	<3.4	<1.8	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<3.4	<1.8
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<8.9	<3.4	<1.8	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<3.4	<1.8
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<1.8	<3.4	<1.8	<4	<1.8	<3.4	<1.8	<3.7	<3.6	<1.7	<1.8	<3.4	<3.4	<1.8

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential	P201 Groundwater Surface Water		MW-18-105	MW-18-105	MW-18-105	MW-18-105	MW-18-106	MW-18-106	MW-19	MW-19-107	MW-19-107	MW-19-108	MW-19-108	MW-19-111	MW-19-111	MW-19-112
Date Collected:				03/03/20	06/04/20	08/28/20	12/07/20	06/02/20	12/02/20	06/11/20	06/03/20	12/01/20	06/03/20	12/01/20	06/03/20	12/01/20	06/04/20
Sample Name:	Drinking Water	Interface	Units	MW-18-105_030320	MW-18-105_060420	MW-18-105_082820	MW-18-105_120720	MW-18-106_060220	MW-18-106_120220	MW-19_061120	MW-19-107_060320	MW-19-107_120120	MW-19-108_060320	MW-19-108_120120	MW-19-111_060320	MW-19-111_120120	MW-19-112_060420
Field																	
Conductivity	- -	- -	mS/cm	0.44	0.46	0.59	0.50	0.52	0.46	0.34	0.88	0.74	1.17	0.96	1.25	1.15	5.34
Dissolved oxygen (DO)	- -	- -	mg/L	0.05	0.18	0.77	1.40	0.72	1.01	1.90	0.45	0.44	0.72	0.15	1.17	0.48	1.13
Oxidation reduction potential (ORP)	- -	- -	millivolts	101.2	-43.6	80.9	120.3	-0.3	130.5	125.6	-74.5	-31.9	-11.7	50.1	33.8	134	-65.2
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.09	7.15	7.30	6.83	6.99	7.26	7.41	6.70	7.01	6.63	6.92	6.68	6.80	6.38
Temperature	- -	- -	Deg C	6.1	12	17.5	9.4	13.3	11.1	16	12.2	10.9	11.7	10.8	11.7	9.7	16
Turbidity	- -	- -	NTU	1.09	1.09	8.53	1.26	2.97	1.8	5.98	1.21	1.12	42.1	1.35	1.5	2.51	1.22
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	<2 [<2]	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	<10 [<10]	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	<90 [<90]	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	<50 [<50]	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	<50 [<50]	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	**3 [4]**	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	<25 [<25]	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	<50 [<50]	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1 [<1]	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<2 [<2]	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	<2 [<2]	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	<5 [<5]	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-18-105 03/03/20 MW-18-105_030320	MW-18-105 06/04/20 MW-18-105_060420	MW-18-105 08/28/20 MW-18-105_082820	MW-18-105 12/07/20 MW-18-105_120720	MW-18-106 06/02/20 MW-18-106_060220	MW-18-106 12/02/20 MW-18-106_120220	MW-19 06/11/20 MW-19_061120	MW-19-107 06/03/20 MW-19-107_060320	MW-19-107 12/01/20 MW-19-107_120120	MW-19-108 06/03/20 MW-19-108_060320	MW-19-108 12/01/20 MW-19-108_120120	MW-19-111 06/03/20 MW-19-111_060320	MW-19-111 12/01/20 MW-19-111_120120	MW-19-112 06/04/20 MW-19-112_060420
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	<6.9	<7.1	NA	<7.1	NA	NA	<7.1	NA	<7	NA	<7	NA
4:2 FTS	- -	- -	ng/L	<7.4	<7.1 [<7.1]	<6.9	<7.1	<6.9	<7.1	NA	<6.9	<7.1	<7.4	<7	<6.9	<7	<7.1
6:2 FTS	- -	- -	ng/L	<7.4	<7.1 [<7.1]	<6.9	<7.1	<6.9	<7.1	NA	<6.9	<7.1	<7.4	<7	<6.9	<7	<7.1
8:2 FTS	- -	- -	ng/L	<7.4	<7.1 [<7.1]	<6.9	<7.1	<6.9	<7.1	NA	<6.9	<7.1	<7.4	<7	<6.9	<7	<7.1
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	<6.9	<7.1	NA	<7.1	NA	NA	<7.1	NA	<7	NA	<7	NA
ADONA	- -	- -	ng/L	NA	NA	<6.9	<7.1	NA	<7.1	NA	NA	<7.1	NA	<7	NA	<7	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	<8.6	<3.6	NA	<3.6	NA	NA	<3.6	NA	<3.5	NA	<3.5	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	<7.4	<7.1 [<7.1]	<3.4	<3.6	<6.9	<3.6	NA	<6.9	<3.6	<7.4	<3.5	<6.9	<3.5	<7.1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	<7.4	<7.1 [<7.1]	<3.4	<3.6	<6.9	<3.6	NA	<6.9	<3.6	<7.4	<3.5	<6.9	<3.5	<7.1
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	**3.5 J**	**3.8 [4.1]**	**5.4**	**2.6**	**3 J**	**1.2 J**	NA	**1.4 J**	**2.1**	**1.3 J**	**1.7 J**	**1.4 J**	**1.3 J**	<3.6
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**2.9 J**	**2.1 J [2.3 J]**	**2.9 J**	**2.1 J**	**2.3 J**	<3.6	NA	**2.5 J**	**2.9 J**	<7.4	<3.5	**2.3 J**	**3 J**	<14
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	<3.4	<1.8	<3.7	<1.8	<3.4	<1.8	<3.6
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	<3.4	<1.8	<3.7	<1.8	<3.4	<1.8	<3.6
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	<3.4	<1.8	<3.7	<1.8	<3.4	<1.8	<3.6
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	<3.4	<1.8	<3.7	<1.8	<3.4	<1.8	<3.6
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	<3.4	<1.8	<3.7	<1.8	**1.4 J**	**1.6 J**	<3.6
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	**1.7 J**	**1.3 J [1.4 J]**	**2.3**	**1.2 J**	**5.5**	**2.1**	NA	**2.9 J**	**5.4**	<3.7	**0.91 J**	**1.4 J**	**1.7 J**	<3.6
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	**1.2 J**	**0.93 J**	**1.2 J**	<1.8	**1.7 J**	**1.8**	<3.6
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	<3.4	<1.8	<3.7	<1.8	<3.4	<1.8	<3.6
Perfluorononanoic acid (PFNA)	6	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	<3.4	<1.8	<3.7	<1.8	<3.4	<1.8	<3.6
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<3.4	<3.6	<3.4	<3.6	NA	<3.4	<3.6	<3.7	<3.5	<3.4	<3.5	<3.6
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**12.4**	**8.9 [9.1]**	**8**	**10.5**	**3.8**	**3.9**	NA	**3 J**	**3.2**	**3.8**	**3.6**	**1.4 J**	<1.8	<3.6
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	**1.6 J**	1.2 J [<3.6]	**1.4 J**	<1.8	<3.4	<1.8	NA	**4.8**	**3**	**5.7**	**3**	**6.2**	**5.6**	<3.6
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	<3.4	<1.8	<3.7	<1.8	<3.4	<1.8	<3.6
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	**2.7 J**	**3.6**	<3.7	<1.8	<3.4	**1.2 J**	<3.6
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	<3.4	<1.8	<3.7	<1.8	<3.4	<1.8	<3.6
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	<3.4	<1.8	<3.7	<1.8	<3.4	<1.8	<3.6
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<3.7	<3.6 [<3.6]	<1.7	<1.8	<3.4	<1.8	NA	<3.4	<1.8	<3.7	<1.8	<3.4	<1.8	<3.6

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-19-112 12/02/20 MW-19-112_120220	MW-19-113 06/05/20 MW-19-113_060520	MW-19-114 06/04/20 MW-19-114_060420	MW-19-114 12/02/20 MW-19-114_120220	MW-19-115 03/04/20 MW-19-115_030420	MW-19-115 06/03/20 MW-19-115_060320	MW-19-115 09/01/20 MW-19-115_090120	MW-19-115 12/01/20 MW-19-115_120120	MW-19-116 03/04/20 MW-19-116_030420	MW-19-116 06/03/20 MW-19-116_060320	MW-19-116 09/02/20 MW-19-116_090220	MW-19-116 12/02/20 MW-19-116_120220	MW-19-117 06/03/20 MW-19-117_060320	MW-19-117 09/02/20 MW-19-117_090220
Field																	
Conductivity	- -	- -	mS/cm	5.68	0.74	0.44	0.38	2.03	2.85	2.90	2.86	1.45	1.94	1.81	1.78	1.06	1.05
Dissolved oxygen (DO)	- -	- -	mg/L	0.08	5.50	0.22	0.57	0.22	0.24	1.99	0.17	0.17	0.18	0.24	0.30	0.30	0.23
Oxidation reduction potential (ORP)	- -	- -	millivolts	-82.1	49.3	8	124.7	-10.9	170.5	-33.2	-67.5	-48.7	-39	-79.8	-95.5	-133.7	-105.8
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.75	7.17	7.17	7.46	7.01	6.94	6.93	7.01	7.00	6.96	6.97	6.99	7.15	7.07
Temperature	- -	- -	Deg C	14.5	14.7	11.9	10.3	12.9	15.6	23.5	11.2	13.1	16.3	19.4	12.6	21.5	19.5
Turbidity	- -	- -	NTU	86.3	21.5	1.01	1.6	9.59	16	23.7	18	1.68	2.5	18.9	0.02	117	41.6
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	NA	**9**	**13**	**8**	**12**	**60**	**61**	**54 [55]**	**82 [83]**	**2**	**2**
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

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Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-19-112 12/02/20 MW-19-112_120220	MW-19-113 06/05/20 MW-19-113_060520	MW-19-114 06/04/20 MW-19-114_060420	MW-19-114 12/02/20 MW-19-114_120220	MW-19-115 03/04/20 MW-19-115_030420	MW-19-115 06/03/20 MW-19-115_060320	MW-19-115 09/01/20 MW-19-115_090120	MW-19-115 12/01/20 MW-19-115_120120	MW-19-116 03/04/20 MW-19-116_030420	MW-19-116 06/03/20 MW-19-116_060320	MW-19-116 09/02/20 MW-19-116_090220	MW-19-116 12/02/20 MW-19-116_120220	MW-19-117 06/03/20 MW-19-117_060320	MW-19-117 09/02/20 MW-19-117_090220
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	<8	NA	NA	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	<8	<7.1	<7.1	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	<8	<7.1	<7.1	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	<8	<7.1	<7.1	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	<8	NA	NA	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	<8	NA	NA	<7.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	<4	NA	NA	<3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	<4	<7.1	<7.1	<3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	<4	<7.1	<7.1	<3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	<2	<3.6	<3.6	**1.2 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	**2.5 J**	**2.5 J**	<7.1	**2.2 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	<2	**1.1 J**	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	<4	<3.6	<3.6	<3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<2	**1.8 J**	**1.9 J**	**2.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<2	**2.7 J**	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	**4**	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<2	<3.6	<3.6	<1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-19-117 12/02/20 MW-19-117_120220	MW-19-118D* 03/03/20 MW-19-118D_030320	MW-19-118D* 06/05/20 MW-19-118D_060520	MW-19-118S* 03/03/20 MW-19-118S_030320	MW-19-118S* 06/05/20 MW-19-118S_060520	MW-19-119D* 03/02/20 MW-19-119D_030220	MW-19-119D* 06/03/20 MW-19-119D_060320	MW-19-119S* 03/02/20 MW-19-119S_030220	MW-19-119S* 06/03/20 MW-19-119S_060320	MW-19-120 03/04/20 MW-19-120_030420	MW-19-120 06/04/20 MW-19-120_060420	MW-19-120 09/02/20 MW-19-120_090220	MW-19-120 12/02/20 MW-19-120_120220
Field																
Conductivity	- -	- -	mS/cm	1.04	1.74	1.68	3.71	2.26	1.04	1.08	1.19	1.24	2.18	2.22	1.69	1.80
Dissolved oxygen (DO)	- -	- -	mg/L	0.23	1.90	4.23	0.70	5.44	1.87	6.29	1.19	1.01	0.23	0.35	0.11	2.68
Oxidation reduction potential (ORP)	- -	- -	millivolts	-118.8	2.8	29.7	26.6	-96.9	-27.4	29.1	-28.5	-50.2	-39.3	-36.5	-25.1	44.4
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.10	7.16	7.20	6.82	6.95	7.15	7.11	7.09	7.12	6.85	6.82	6.96	7.13
Temperature	- -	- -	Deg C	13.2	6.5	18.5	6.2	21.6	9	20.7	10.3	21.4	11.4	16.5	16.6	11.7
Turbidity	- -	- -	NTU	25.3	6.2	9.03	0.02	8.81	0.02	9.31	0.2	9.61	12.1	22.7	3.14	0.02
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2	NA	<2
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<10	NA	<10
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<90	NA	<90
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
1,4-Dioxane	7.2	280	µg/L	<1	<0.20 F1*	<0.20 [<0.20]*	**3.9***	**0.99***	**0.57***	**0.89***	**0.34 [0.38]***	**0.41 [0.44]***	**198**	**184**	**137**	**28**
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	NA	<50
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	NA	<50
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**40**	NA	<5
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<25	NA	<25
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	NA	<50
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<1
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2	NA	<2
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2	NA	<2
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	<5

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential	P201 Groundwater Surface Water		MW-19-117	MW-19-118D*	MW-19-118D*	MW-19-118S*	MW-19-118S*	MW-19-119D*	MW-19-119D*	MW-19-119S*	MW-19-119S*	MW-19-120	MW-19-120	MW-19-120	MW-19-120
Date Collected:				12/02/20	03/03/20	06/05/20	03/03/20	06/05/20	03/02/20	06/03/20	03/02/20	06/03/20	03/04/20	06/04/20	09/02/20	12/02/20
Sample Name:	Drinking Water	Interface	Units	MW-19-117_120220	MW-19-118D_030320	MW-19-118D_060520	MW-19-118S_030320	MW-19-118S_060520	MW-19-119D_030220	MW-19-119D_060320	MW-19-119S_030220	MW-19-119S_060320	MW-19-120_030420	MW-19-120_060420	MW-19-120_090220	MW-19-120_120220
Inorganics (via EPA Method 537 Modified)																
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

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

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-19-121	MW-19-121	MW-19-121	MW-19-121	MW-19-122	MW-19-122	MW-19-122	MW-19-122	MW-19-123	MW-19-123	MW-19-123	MW-19-123	MW-19-124	MW-19-124
Date Collected:				03/03/20	06/04/20	08/31/20	12/02/20	03/04/20	06/05/20	09/02/20	12/03/20	03/04/20	06/04/20	09/01/20	12/03/20	06/05/20	09/02/20
Sample Name:				MW-19-121_030320	MW-19-121_060420	MW-19-121_083120	MW-19-121_120220	MW-19-122_030420	MW-19-122_060520	MW-19-122_090220	MW-19-122_120320	MW-19-123_030420	MW-19-123_060420	MW-19-123_090120	MW-19-123_120320	MW-19-124_060520	MW-19-124_090220
Field																	
Conductivity	- -	- -	mS/cm	0.97	1.28	1.63	1.60	4.08	4.08	3.31	4.32	1.96	2.08	1.69	2.12	2.06	1.86
Dissolved oxygen (DO)	- -	- -	mg/L	0.14	1.16	6.06	2.53	0.31	0.21	1.87	0.11	0.21	0.22	1.46	5.35	0.18	0.12
Oxidation reduction potential (ORP)	- -	- -	millivolts	-36	-26.3	106.5	70	-30.1	-47.4	89.9	39.3	-32.4	-9.5	53.9	78.8	41.1	-90.6
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.02	6.88	7.53	7.26	6.72	6.74	6.74	6.62	6.90	6.86	6.85	6.79	6.83	6.89
Temperature	- -	- -	Deg C	12.7	16.7	18.6	13.6	11.6	17	15.2	12.4	11.4	15.4	14.3	11.7	16.4	15.6
Turbidity	- -	- -	NTU	13.4	60	444	8.02	0.02	19.5	8.44	35	0.02	7.39	4.17	4.32	8.65	1.56
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**119**	**115**	**17**	**4**	**41 [41]**	**42**	**33**	**34**	**76**	**75**	**51**	**39**	**197**	**230 Y**
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:				MW-19-121	MW-19-121	MW-19-121	MW-19-121	MW-19-122	MW-19-122	MW-19-122	MW-19-122	MW-19-123	MW-19-123	MW-19-123	MW-19-123	MW-19-124	MW-19-124
Date Collected:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	03/03/20	06/04/20	08/31/20	12/02/20	03/04/20	06/05/20	09/02/20	12/03/20	03/04/20	06/04/20	09/01/20	12/03/20	06/05/20	09/02/20
Sample Name:				MW-19-121_030320	MW-19-121_060420	MW-19-121_083120	MW-19-121_120220	MW-19-122_030420	MW-19-122_060520	MW-19-122_090220	MW-19-122_120320	MW-19-123_030420	MW-19-123_060420	MW-19-123_090120	MW-19-123_120320	MW-19-124_060520	MW-19-124_090220
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	<0.5	<0.5	<0.5	**8.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	**0.10**	**0.14**	**0.06**	**1.74**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	**0.7**	**0.8**	**0.9**	**0.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
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RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-19-124 12/03/20 MW-19-124_120320	MW-19-125 03/04/20 MW-19-125_030420	MW-19-125* 06/04/20 MW-19-125_060420	MW-20-126 07/23/20 MW-20-126_072320	MW-20-126 09/02/20 MW-20-126_090220	MW-20-126 12/03/20 MW-20-126_120320	MW-20-127 07/23/20 MW-20-127_072320	MW-20-127 08/31/20 MW-20-127_083120	MW-20-127 12/02/20 MW-20-127_120220	MW-20-128 07/23/20 MW-20-128_072320	MW-20-128 09/01/20 MW-20-128_090120	MW-20-128 12/03/20 MW-20-128_120320	MW-20-129 07/23/20 MW-20-129_072320
Field																
Conductivity	- -	- -	mS/cm	2.70	1.42	1.67	1.94	2.66	2.02	1.63	2.67	2.32	1.39	1.46	1.68	2.97
Dissolved oxygen (DO)	- -	- -	mg/L	0.11	0.23	3.95	0.26	4.26	0.94	0.71	7.15	0.06	0.15	9.82	7.13	0.41
Oxidation reduction potential (ORP)	- -	- -	millivolts	-54.2	-207.7	-199.7	18.6	105.7	122.4	-174	-73.9	-60.9	58.7	156.7	185.1	-21.8
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.86	7.87	7.39	6.96	7.08	6.81	7.17	7.01	6.91	7.20	7.87	7.21	7.03
Temperature	- -	- -	Deg C	13.2	7.5	21.3	16.5	19.9	10.2	16.2	21.0	11.5	16.9	15.6	11.5	16.4
Turbidity	- -	- -	NTU	0.02	6.44	84.1	14.1	21.2	114	28.6	30.2	9.52	8.07	NR	562	18.3
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**420 Y**	<1*	<0.20*	**370 Y**	**360 Y**	**320 Y**	**85**	**115**	**157**	**270 Y**	**112**	**20**	**126**
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential	P201 Groundwater Surface Water		MW-19-124	MW-19-125	MW-19-125*	MW-20-126	MW-20-126	MW-20-126	MW-20-127	MW-20-127	MW-20-127	MW-20-128	MW-20-128	MW-20-128	MW-20-129
Date Collected:				12/03/20	03/04/20	06/04/20	07/23/20	09/02/20	12/03/20	07/23/20	08/31/20	12/02/20	07/23/20	09/01/20	12/03/20	07/23/20
Sample Name:	Drinking Water	Interface	Units	MW-19-124_120320	MW-19-125_030420	MW-19-125_060420	MW-20-126_072320	MW-20-126_090220	MW-20-126_120320	MW-20-127_072320	MW-20-127_083120	MW-20-127_120220	MW-20-128_072320	MW-20-128_090120	MW-20-128_120320	MW-20-129_072320
Inorganics (via EPA Method 537 Modified)																
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	<0.5	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	**0.04**	**0.16**	**0.09**	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	**0.8**	**0.7**	**0.6**	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID: / Date Collected: / Sample Name:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-20-129 09/01/20 MW-20-129_090120	MW-20-129 12/03/20 MW-20-129_120320	MW-20-130 07/23/20 MW-20-130_072320	MW-20-130 12/03/20 MW-20-130_120320	MW-20-131 12/03/20 MW-20-131_120320	MW-20-132 12/03/20 MW-20-132_120320	MW-23 06/05/20 MW-23_060520	MW-23 12/08/20 MW-23_120820	MW-91-2R 03/04/20 MW-91-2R_030420	MW-91-2R 06/09/20 MW-91-2R_060920	MW-91-2R 12/08/20 MW-91-2R_120820	MW-91-5* 06/03/20 MW-91-5_060320	MW-91-6* 06/04/20 MW-91-6_060420	MWBP-10-UST5-6 06/04/20 MWBP-10-UST5-6_060420
Field																	
Conductivity	- -	- -	mS/cm	4.97	3.33	0.68	0.73	2.90	1.68	1.21	1.01	1.15	1.31	1.15	0.50	1.30	2.81
Dissolved oxygen (DO)	- -	- -	mg/L	0.35	0.09	0.60	0.38	0.47	0.51	0.93	0.02	3.40	0.03	0.04	7.14	0.94	4.76
Oxidation reduction potential (ORP)	- -	- -	millivolts	-45.5	90.5	-48.1	-13.9	72.4	55	-91.3	-91.4	-147	-136.7	-129	65.6	-123.8	-86.6
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.85	6.93	7.06	7.29	7.44	7.54	7.09	7.09	7.29	7.00	7.14	7.21	7.60	7.30
Temperature	- -	- -	Deg C	20.4	10.7	15.4	13.1	11.9	12.8	14	11.2	12.5	16.1	9.7	14.7	19.2	13.1
Turbidity	- -	- -	NTU	21.8	86.4	17.5	25.1	1.54	1.02	1.24	3.42	153	1.2	63.5	9.78	9.7	2.59
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																	
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	<2	<2	NA	NA	NA	NA	NA	NA	NA	<2
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	<10	<10	NA	NA	NA	NA	NA	NA	NA	<10
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	<90	<90	NA	NA	NA	NA	NA	NA	NA	<90
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
1,4-Dioxane	7.2	280	µg/L	**126**	**140**	NA	**61**	NA	NA	NA	NA	NA	**5**	NA	**0.14 J***	**0.40***	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	<50	<50	NA	NA	NA	NA	NA	NA	NA	<50
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Acetone	730	1,700	µg/L	NA	NA	NA	NA	<50	<50	NA	NA	NA	NA	NA	NA	NA	<50
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Bromoform	80	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	**3**	**9**	NA	NA	NA	NA	NA	NA	NA	<1
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	**3**	**1**	NA	NA	NA	NA	NA	NA	NA	<1
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
Benzene	5.0	200	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
Styrene	100	80	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Toluene	790	270	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Naphthalene	520	11	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	<25	<25	NA	NA	NA	NA	NA	NA	NA	<25
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	<50	<50	NA	NA	NA	NA	NA	NA	NA	<50
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA	NA	NA	NA	<1
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	<2	<2	NA	NA	NA	NA	NA	NA	NA	<2
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	<2	<2	NA	NA	NA	NA	NA	NA	NA	<2
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA	NA	NA	NA	<5

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-20-129	MW-20-129	MW-20-130	MW-20-130	MW-20-131	MW-20-132	MW-23	MW-23	MW-91-2R	MW-91-2R	MW-91-2R	MW-91-5*	MW-91-6*	MWBP-10-UST5-6
Date Collected:				09/01/20	12/03/20	07/23/20	12/03/20	12/03/20	12/03/20	06/05/20	12/08/20	03/04/20	06/09/20	12/08/20	06/03/20	06/04/20	06/04/20
Sample Name:				MW-20-129_090120	MW-20-129_120320	MW-20-130_072320	MW-20-130_120320	MW-20-131_120320	MW-20-132_120320	MW-23_060520	MW-23_120820	MW-91-2R_030420	MW-91-2R_060920	MW-91-2R_120820	MW-91-5_060320	MW-91-6_060420	MWBP-10-UST5-6_060420
Inorganics (via EPA Method 537 Modified)																	
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.006**	NA	NA	NA	**0.012**
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	<0.005
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.01	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	<0.005
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.003	NA	NA	NA	<0.003
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	<0.005
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	<0.005
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																	
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																	
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																	
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	<7.1	<7.7	NA	NA	NA	<7.1	NA	NA	<7.1	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	<7.1	<7.7	NA	NA	<7.1	<7.1	<6.7	<7.1	<7.1	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	<7.1	<7.7	NA	NA	<7.1	<7.1	<6.7	<7.1	<7.1	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	<7.1	<7.7	NA	NA	<7.1	<7.1	<6.7	<7.1	<7.1	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	<7.1	<7.7	NA	NA	NA	<7.1	NA	NA	<7.1	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	<7.1	<7.7	NA	NA	NA	<7.1	NA	NA	<7.1	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	<3.6	<19	NA	NA	NA	<3.6	NA	NA	<3.6	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	<3.6	<7.7	NA	NA	<7.1	<3.6	<6.7	<7.1	<3.6	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	<3.6	<7.7	NA	NA	<7.1	<3.6	<6.7	<7.1	<3.6	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	<1.8	**10.1**	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	**4.3**	**6.1 J**	NA	NA	<7.1	<3.6	<6.7	<7.1	<3.6	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	**1.9**	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	**10.8**	**2.3 J**	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	<3.6	<3.8	NA	NA	<3.6	<3.6	<3.3	<3.6	<3.6	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	**5.8**	**1.6 J**	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<8.9	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<8.9	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	<1.8	<3.8	NA	NA	<3.6	<1.8	<3.3	<3.6	<1.8	NA	NA	NA

See notes on last page.

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

Location ID:	P201 Residential	P201 Groundwater Surface Water		MWBP-11-UST1-4	MWBP-12-UST1-4	P2-MW-02	P2-MW-04	P3-SB-28	P6-SB-07	P6-SB-07	P6-SB-07	P6-SB-07	PW-14-01	PW-14-01	PW-14-02	PW-14-02
Date Collected:				06/02/20	06/02/20	06/09/20	06/10/20	06/08/20	03/04/20	06/04/20	08/31/20	12/02/20	06/09/20	12/04/20	06/03/20	09/02/20
Sample Name:	Drinking Water	Interface	Units	MWBP-11-UST1-4_060220	MWBP-12-UST1-4_060220	P2-MW-02_060920	P2-MW-04_061020	P3-SB-28_060820	P6-SB-07_030420	P6-SB-07_060420	P6-SB-07_083120	P6-SB-07_120220	PW-14-01_060920	PW-14-01_120420	PW-14-02_060320	PW-14-02_090220
Field																
Conductivity	- -	- -	mS/cm	1.18	0.42	0.45	1.53	0.41	0.63	0.73	0.51	0.53	3.20	2.19	2.21	2.68
Dissolved oxygen (DO)	- -	- -	mg/L	0.30	1.98	0.02	0.21	0.53	1.44	0.18	0.11	2.98	0.27	2.76	0.39	7.57
Oxidation reduction potential (ORP)	- -	- -	millivolts	38.2	226.6	-9.9	-86.3	-9.7	32.1	-91.6	-159	20.1	-68.3	-4.7	49	53.8
pH	6.5 to 8.5	6.5 to 9.0	s.u.	9.66	8.05	6.87	7.21	7.69	7.40	7.34	7.56	7.60	6.78	6.87	7.00	7.38
Temperature	- -	- -	Deg C	17.9	16.4	14.6	17.4	18	8.7	15.9	17.7	12.8	18.1	7.6	15.5	20.7
Turbidity	- -	- -	NTU	0.02	0.59	1.81	7.35	0.05	1.18	2.2	1.7	7.05	1.57	16.5	0.02	3.14
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																
1,1,1,2-Tetrachloroethane	77	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
1,2,3-Trichloropropane	42	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Acrylonitrile	2.6	2	µg/L	<2	<2	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2 [<2]	NA
Bromobenzene	18	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Chlorobromomethane	- -	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
Dibromomethane	80	- -	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
Ethyl ether	10	- -	µg/L	<10	<10	NA	NA	NA	NA	NA	NA	NA	NA	NA	<10 [<10]	NA
Iodomethane	- -	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
N-Butylbenzene	80	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
N-Propylbenzene	80	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
tert-Butylbenzene	80	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Tetrahydrofuran	95	11,000	µg/L	<90	<90	NA	NA	NA	NA	NA	NA	NA	NA	NA	<90 [<90]	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
1,2-Dichlorobenzene	600	13	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
1,4-Dichlorobenzene	75	17	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
1,4-Dioxane	7.2	280	µg/L	NA	NA	NA	**31**	NA	NA	NA	NA	NA	**240 Y**	**47 Y**	**160 [160]**	**43**
1,1,1-Trichloroethane	200	89	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
2-Hexanone	1,000	- -	µg/L	<50	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50 [<50]	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Acetone	730	1,700	µg/L	<50	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50 [<50]	NA
1,1,2-Trichloroethane	5.0	330	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Bromodichloromethane	80	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
1,1-Dichloroethane	880	740	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Bromoform	80	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
1,1-Dichloroethene	7.0	130	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
1,2-Dichloroethane	5.0	360	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Carbon disulfide	800	- -	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
Carbon tetrachloride	5.0	38	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
cis-1,2-Dichloroethene	70	620	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Chlorobenzene	100	25	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Chloroform (Trichloromethane)	80	350	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Trichloroethene	5.0	200	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
Tetrachloroethene	5.0	60	µg/L	<1	**1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Vinyl chloride	2.0	13	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
2-Methylnaphthalene	260	19	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
Chloroethane	430	1,100	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
Benzene	5.0	200	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Ethylbenzene	74	18	µg/L	**1**	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Methylene chloride	5.0	1,500	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
Styrene	100	80	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Toluene	790	270	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Naphthalene	520	11	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	<25	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	<25 [<25]	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	<50	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50 [<50]	NA
1,2,4-Trichlorobenzene	70	99	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
1,2,4-Trimethylbenzene	63	17	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
1,3,5-Trimethylbenzene	72	45	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
1,2-Dichloropropane	5.0	230	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
1,3-Dichlorobenzene	6.6	28	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
Dibromochloromethane	80	- -	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
Isopropyl benzene	800	28	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA
o-Xylene	- -	- -	µg/L	<1	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1 [<1]	NA
m&p-Xylene	- -	- -	µg/L	**3**	<2	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2 [<2]	NA
Total Xylenes	280	49	µg/L	**3**	<2	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2 [<2]	NA
Hexachloroethane	7.3	6.7	µg/L	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5 [<5]	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential	P201 Groundwater Surface Water		MWBP-11-UST1-4	MWBP-12-UST1-4	P2-MW-02	P2-MW-04	P3-SB-28	P6-SB-07	P6-SB-07	P6-SB-07	P6-SB-07	PW-14-01	PW-14-01	PW-14-02	PW-14-02
Date Collected:				06/02/20	06/02/20	06/09/20	06/10/20	06/08/20	03/04/20	06/04/20	08/31/20	12/02/20	06/09/20	12/04/20	06/03/20	09/02/20
Sample Name:	Drinking Water	Interface	Units	MWBP-11-UST1-4_060220	MWBP-12-UST1-4_060220	P2-MW-02_060920	P2-MW-04_061020	P3-SB-28_060820	P6-SB-07_030420	P6-SB-07_060420	P6-SB-07_083120	P6-SB-07_120220	PW-14-01_060920	PW-14-01_120420	PW-14-02_060320	PW-14-02_090220
Inorganics (via EPA Method 537 Modified)																
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	**0.012**	**0.010**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	<0.005	**0.006**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	<0.003	<0.003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	<0.005	**0.010**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	<7.4	<7.1	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	<7.1	NA	NA	<6.9 [<6.7]	<6.7	<7.4	<7.1	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	<7.1	NA	NA	<6.9 [<6.7]	<6.7	<7.4	<7.1	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	<7.1	NA	NA	<6.9 [<6.7]	<6.7	<7.4	<7.1	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	<7.4	<7.1	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	<7.4	<7.1	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	<9.3	<3.6	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	<7.1	NA	NA	<6.9 [<6.7]	<6.7	<3.7	<3.6	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	<7.1	NA	NA	<6.9 [<6.7]	<6.7	<3.7	<3.6	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	<3.6	NA	NA	**2.1 J [2.1 J]**	**5.2**	**8.3**	**6.3**	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	**3.4 J**	NA	NA	**220 [208]**	**254**	**338**	**391**	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	<3.6	NA	NA	<3.4 [<3.3]	<3.3	<1.9	<1.8	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	**1.2 J**	NA	NA	**27.1 [26.5]**	**27.3**	**40.5**	**53.2**	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	<3.6	NA	NA	<3.4 [<3.3]	<3.3	<1.9	<1.8	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	<3.6	NA	NA	<3.4 [<3.3]	<3.3	**1.9**	**0.96 J**	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	<3.6	NA	NA	**700 [666]**	**759**	**1,170**	**1,240**	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	<3.6	NA	NA	**3 J [2.7 J]**	**4**	**4.9**	**5**	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	<3.6	NA	NA	**760 [737]**	**885**	**1,320**	**1,460**	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	<18	NA	NA	<3.4 [<3.3]	<3.3	<1.9	<1.8	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	<3.6	NA	NA	**86.9 [85.9]**	**92.7**	**154**	**197**	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	<3.6	NA	NA	<3.4 [<3.3]	<3.3	<3.7	<3.6	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	<18	NA	NA	**54.9 [56.5]**	**57.2**	**90.4**	**126**	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	<3.6	NA	NA	**814 [792]**	**1,040**	**1,590**	**1,780**	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	<3.6	NA	NA	1.1 J [<3.3]	**1.8 J**	**2.8**	**3.3**	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	<3.6	NA	NA	**966 [914]**	**932**	**1,230**	**1,580**	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	<3.6	NA	NA	<3.4 [<3.3]	<3.3	<1.9	<1.8	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	<3.6	NA	NA	<3.4 [<3.3]	<3.3	<1.9	<1.8	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	<3.6	NA	NA	<3.4 [<3.3]	<3.3	<1.9	<1.8	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	PW-14-02	PW-14-03	PW-14-03	PW-14-03	PW-14-03	TW-14-02	TW-14-02	TW-14-02	TW-14-02	TW-14-06	TW-14-06	TW-14-06	TW-15-11	TW-15-11	TW-15-11
Date Collected:				12/03/20	03/03/20	06/10/20	08/27/20	12/01/20	03/04/20	06/04/20	09/01/20	12/02/20	03/03/20	08/31/20	12/02/20	03/03/20	08/27/20	12/01/20
Sample Name:				PW-14-02_120320	PW-14-03_030320	PW-14-03_061020	PW-14-03_082720	PW-14-03_120120	TW-14-02_030420	TW-14-02_060420	TW-14-02_090120	TW-14-02_120220	TW-14-06_030320	TW-14-06_083120	TW-14-06_120220	TW-15-11_030320	TW-15-11_082720	TW-15-11_120120
Field																		
Conductivity	- -	- -	mS/cm	1.80	2.64	2.09	2.91	2.15	5.21	5.14	4.31	3.99	2.43	3.60	2.35	3.46	3.51	2.43
Dissolved oxygen (DO)	- -	- -	mg/L	1.15	5.90	0.02	4.51	8.30	0.34	0.37	10.72	9.81	12.46	6.69	12.49	5.91	4.11	10.66
Oxidation reduction potential (ORP)	- -	- -	millivolts	-75.2	74	-19.2	69.3	135.1	-4.7	22.1	154.1	180.5	33.6	77.2	263.7	50.5	86.1	107
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.96	6.78	6.40	6.75	7.05	6.51	6.50	7.19	7.38	7.12	6.81	7.16	6.52	6.67	6.64
Temperature	- -	- -	Deg C	8.2	11.9	18.1	21.7	6.7	12.6	16.7	16.2	12.4	13.1	20.1	8.5	11.1	21.1	8.6
Turbidity	- -	- -	NTU	21.1	0.02	9.12	3.18	20.6	0.02	3.32	555	62.5	0.02	23.8	1000	3.1	4.88	6.35
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)																		
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	<10	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	<90	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**97**	**75**	**65**	**69**	**71**	**470 Y**	**410 Y**	**3**	<1	**23**	**4 [4]**	<1 [<1]	**130 Y**	**120 Y**	**51**
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	<25	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	PW-14-02	PW-14-03	PW-14-03	PW-14-03	PW-14-03	TW-14-02	TW-14-02	TW-14-02	TW-14-02	TW-14-06	TW-14-06	TW-14-06	TW-15-11	TW-15-11	TW-15-11
Date Collected:				12/03/20	03/03/20	06/10/20	08/27/20	12/01/20	03/04/20	06/04/20	09/01/20	12/02/20	03/03/20	08/31/20	12/02/20	03/03/20	08/27/20	12/01/20
Sample Name:				PW-14-02_120320	PW-14-03_030320	PW-14-03_061020	PW-14-03_082720	PW-14-03_120120	TW-14-02_030420	TW-14-02_060420	TW-14-02_090120	TW-14-02_120220	TW-14-06_030320	TW-14-06_083120	TW-14-06_120220	TW-15-11_030320	TW-15-11_082720	TW-15-11_120120
Inorganics (via EPA Method 537 Modified)																		
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)																		
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)																		
Nitrate (as N)	10	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5 [<0.5]	<0.5 [<0.5]	NA	NA	NA
Phosphorus	63	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	**29**	**1.6 [1.1]**	**22 [24]**	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	**22.4**	**2.4 [2.2]**	**18.0 [19.1]**	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																		
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on last page.

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

Location ID:	P201 Residential	P201 Groundwater Surface Water		TW-15-12	TW-15-12	TW-15-12	TW-15-12	TWP-90-04*	TWP-90-05*	UNK-10	UNK-11	UNK-15	UNK-15	UNK-15	UNK-15
Date Collected:				03/03/20	06/02/20	08/31/20	12/02/20	12/07/20	12/07/20	06/08/20	06/08/20	03/03/20	06/05/20	08/27/20	12/08/20
Sample Name:	Drinking Water	Interface	Units	TW-15-12_030320	TW-15-12_060220	TW-15-12_083120	TW-15-12_120220	TWP-90-04_120720	TWP-90-05_120720	UNK-10_060820	UNK-11_060820	UNK-15_030320	UNK-15_060520	UNK-15_082720	UNK-15_120820
Field															
Conductivity	- -	- -	mS/cm	1.49	2.31	1.99	1.66	NR	NR	0.31	0.34	0.40	0.69	0.72	0.54
Dissolved oxygen (DO)	- -	- -	mg/L	0.33	1.33	7.42	9.19	NR	NR	0.11	3.07	1.95	0.60	0.10	1.33
Oxidation reduction potential (ORP)	- -	- -	millivolts	-17.1	27.9	89.2	206.9	NR	NR	-144.5	40.5	126.9	20.2	-97	119.2
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.02	6.92	7.49	7.26	NR	NR	7.33	7.82	8.57	7.88	7.95	7.55
Temperature	- -	- -	Deg C	12.6	15.6	21.4	9.6	NR	NR	15.7	15.4	7.9	16.9	23.8	11.5
Turbidity	- -	- -	NTU	8.1	691	416	852	NR	NR	1.42	10.2	1.49	10.3	1.08	1.03
Volatile Organics (via EPA Method 537 Modified or EPA Method SW5030C/8260C)															
1,1,1,2-Tetrachloroethane	77	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
1,2,3-Trichlorobenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
1,2,3-Trichloropropane	42	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
1,2,3-Trimethylbenzene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
2-Phenylbutane (sec-Butylbenzene)	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Acrylonitrile	2.6	2	µg/L	NA	NA	NA	NA	NA	NA	<2	<2	NA	NA	NA	NA
Bromobenzene	18	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Chlorobromomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
Dibromomethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
Ethyl ether	10	- -	µg/L	NA	NA	NA	NA	NA	NA	<10	<10	NA	NA	NA	NA
Iodomethane	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
N-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
N-Propylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
tert-Butylbenzene	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Tetrahydrofuran	95	11,000	µg/L	NA	NA	NA	NA	NA	NA	<90	<90	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	0.2	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
1,2-Dichlorobenzene	600	13	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
1,4-Dichlorobenzene	75	17	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
1,4-Dioxane	7.2	280	µg/L	**220 Y**	**210 Y**	**100 Y**	**34**	**0.21 [0.22]***	**0.41***	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	200	89	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
2-Hexanone	1,000	- -	µg/L	NA	NA	NA	NA	NA	NA	<50	<50	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	8.5	78	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Acetone	730	1,700	µg/L	NA	NA	NA	NA	NA	NA	<50	<50	NA	NA	NA	NA
1,1,2-Trichloroethane	5.0	330	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Bromodichloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
1,1-Dichloroethane	880	740	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Bromoform	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
1,1-Dichloroethene	7.0	130	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Bromomethane (Methyl bromide)	10	5.0	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
1,2-Dichloroethane	5.0	360	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Carbon disulfide	800	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
Carbon tetrachloride	5.0	38	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
cis-1,2-Dichloroethene	70	620	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Chlorobenzene	100	25	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	1,500	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Chloroform (Trichloromethane)	80	350	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Trichloroethene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Chloromethane (Methyl chloride)	260	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
Tetrachloroethene	5.0	60	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
cis-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Vinyl chloride	2.0	13	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
2-Methylnaphthalene	260	19	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
Chloroethane	430	1,100	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
Dichlorodifluoromethane (CFC-12)	1,700	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
Benzene	5.0	200	µg/L	NA	NA	NA	NA	NA	NA	<1	**3**	NA	NA	NA	NA
Ethylbenzene	74	18	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Methylene chloride	5.0	1,500	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
Styrene	100	80	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Toluene	790	270	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
trans-1,3-Dichloropropene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
Trichlorofluoromethane (CFC-11)	2,600	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Naphthalene	520	11	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	170,000	32	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	µg/L	NA	NA	NA	NA	NA	NA	<25	<25	NA	NA	NA	NA
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	- -	µg/L	NA	NA	NA	NA	NA	NA	<50	<50	NA	NA	NA	NA
1,2,4-Trichlorobenzene	70	99	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
1,2,4-Trimethylbenzene	63	17	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
1,3,5-Trimethylbenzene	72	45	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
1,2-Dichloropropane	5.0	230	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
1,3-Dichlorobenzene	6.6	28	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
Dibromochloromethane	80	- -	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
Isopropyl benzene	800	28	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA
o-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<1	<1	NA	NA	NA	NA
m&p-Xylene	- -	- -	µg/L	NA	NA	NA	NA	NA	NA	<2	<2	NA	NA	NA	NA
Total Xylenes	280	49	µg/L	NA	NA	NA	NA	NA	NA	<2	<2	NA	NA	NA	NA
Hexachloroethane	7.3	6.7	µg/L	NA	NA	NA	NA	NA	NA	<5	<5	NA	NA	NA	NA

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2020 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	TW-15-12	TW-15-12	TW-15-12	TW-15-12	TWP-90-04*	TWP-90-05*	UNK-10	UNK-11	UNK-15	UNK-15	UNK-15	UNK-15
Date Collected:				03/03/20	06/02/20	08/31/20	12/02/20	12/07/20	12/07/20	06/08/20	06/08/20	03/03/20	06/05/20	08/27/20	12/08/20
Sample Name:				TW-15-12_030320	TW-15-12_060220	TW-15-12_083120	TW-15-12_120220	TWP-90-04_120720	TWP-90-05_120720	UNK-10_060820	UNK-11_060820	UNK-15_030320	UNK-15_060520	UNK-15_082720	UNK-15_120820
Inorganics (via EPA Method 537 Modified)															
Antimony	0.006	0.13	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	2.0	1.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	0.5	7.2	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.005	0.0045	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium III	0.1	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI (hexavalent)	0.1	0.011	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	0.04	0.1	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	0.05	4.5	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.002	0.0000013	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.05	0.005	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	0.034	0.0002	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.4	0.26	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Filtered (via EPA Method 537 Modified)															
Arsenic (dissolved)	0.01	0.01	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	- -	0.16	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry (via EPA Method 537 Modified)															
Nitrate (as N)	10	- -	mg/L	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	- -	mg/L	**0.03**	**0.31**	**0.45**	**0.76**	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	250	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	500	- -	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	- -	- -	mg/L	**0.4**	**0.9**	**1.0**	**2.0**	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)															
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<6.9	<7.1
4:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<7.4	<7.1	<6.9	<7.1
6:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<7.4	<7.1	<6.9	<7.1
8:2 FTS	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<7.4	<7.1	<6.9	<7.1
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<6.9	<7.1
ADONA	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<6.9	<7.1
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<8.6	<3.6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<7.4	<7.1	<3.4	<3.6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<7.4	<7.1	<3.4	<3.6
Perfluorobutanesulfonic acid (PFBS)	420	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**1.9 J**	**1.7 J**	**2.2**	**2.1**
Perfluorobutanoic acid (PFBA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**15.8**	**15.1**	**17.1**	**15.9**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<3.7	<3.6	<1.7	<1.8
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**1.2 J**	**2.1 J**	**2.8**	**1.8**
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<3.7	<3.6	<1.7	<1.8
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**13.6**	**16**	**18.9**	**20.9**
Perfluoroheptanoic acid (PFHpA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**7.7**	**11.1**	**12.1**	**8.2**
Perfluorohexanesulfonic acid (PFHxS)	51	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**10.6**	**12.7**	**13.9**	**16.1**
Perfluorohexanoic acid (PFHxA)	400,000	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**9.6**	**14**	**16.5**	**11.6**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<3.7	**2 J**	<1.7	<1.8
Perfluorononanoic acid (PFNA)	6	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**3.3 J**	**4.7**	**5.3**	**4.9**
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<3.7	<3.6	<3.4	<3.6
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**810**	**913**	**1,350**	**1,220**
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**26.6**	**33.1**	**37**	**33.9**
Perfluoropentanesulfonic acid (PFPeS)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**1.5 J**	**1.8 J**	**1.9**	**1.8**
Perfluoropentanoic acid (PFPeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	**14.6**	**17.3**	**18.6**	**14.4**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<3.7	<3.6	<1.7	<1.8
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<3.7	<3.6	<1.7	<1.8
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	<3.7	<3.6	<1.7	<1.8

See notes on last page.

Table 2
Summary of Groundwater Analytical Results
2019 Annual Groundwater Report
RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Data Flagging:
Bold font represents data where detections were noted above the laboratory method detection limit.
Gray shading represents result exceeding either or both the EGLE Part 201 Generic Cleanup Criteria and Screening Levels (dated January 10, 2018) or the EGLE GSI Criteria (Updated June 25, 20:

Notes:
1. EGLE Part 201 Residential Drinking Water Criteria and Groundwater Surface Water Interface Criteria from the Generic Cleanup Criteria and Screening Levels (dated January 10, 2018) are used for comparison with all VOC and Inorganic data and revised criteria values (dated December 21, 2020) are used for comparison with all PFAS data.
2. 1,4-Dioxane is compared to a drinking water criteria of 7.2 µg/L per the *MDEQ Establishment of Cleanup Criteria for 1,4 -Dioxane: Emergency Rules* dated October 27, 2016.

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

Lab and Validation Data Qualifiers:
F1 = Matrix spike and/or matrix spike duplicate recovery is outside acceptance limits.
J = The compound was positively identified, however, the associated numerical value is an estimated concentration only.
Y = Elevated reporting limit due to high target concentration.

Table 3
LNAPL Thickness, January to December 2020
2020 Annual Groundwater Monitoring Report
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Depth to Water (feet below TOC)	Depth to LNAPL (feet below TOC)	Calculated Thickness NAPL (feet)	Groundwater Elevation (feet msl)	Corrected Groundwater Elevation (feet msl)
Plant 2									
LMW-12-01	6/1/20	864.91	862.14	14.77	8.61	NP	NP	856.30	856.30
	12/8/20	864.91	862.14	NM	8.4	NP	NP	856.51	856.51
LMW-12-02	6/1/20	865.25	862.17	12.9	7.09	NP	NP	858.16	858.16
	12/8/20	865.25	862.17	NM	8.45	NP	NP	856.80	856.80
LMW-12-03D	6/1/20	864.99	862.08	NM	17.16	9.66	7.5	847.83	854.58
	12/8/20	864.99	862.08	NM	18.55	6.55	12	846.44	857.23
LMW-12-03S	6/1/20	864.93	862.06	NM	8.17	8.16	0.01	856.76	856.77
	12/8/20	864.93	862.06	NM	5.65	NP	NP	859.28	859.28
LMW-12-04	12/8/20	864.94	862.12	NM	8.41	NP	NP	856.53	856.53
LMW-12-05	6/1/20	865.03	862.17	NM	10.24	10.16	0.08	854.79	854.86
	12/8/20	865.03	862.17	NM	12.21	10.75	1.46	852.82	854.13
LMW-12-06	6/1/20	865.02	862.15	NM	7.19	7.18	0.01	857.83	857.84
	12/8/20	865.02	862.15	NM	7.64	NP	NP	857.38	857.38
LMW-12-07	6/1/20	864.13	861.50	NM	5.63	5.62	0.01	858.50	858.51
	12/8/20	864.13	861.50	NM	4.44	NP	NP	859.69	859.69
LMW-12-08	6/1/20	864.40	861.56	NM	9.02	8.13	0.89	855.38	856.18
	12/8/20	864.40	861.56	NM	6.29	4.99	1.3	858.11	859.28
LMW-14-12D	6/1/20	864.59	862.11	NM	24.92	8.21	16.71	839.67	854.70
	12/8/20	864.59	862.11	25.00	25.00	6.70	18.3	839.59	856.05
LMW-14-13D	12/8/20	865.03	862.06	NM	7.99	NP	NP	857.04	857.04
LMW-14-14D	6/1/20	864.89	861.90	24.92	11.78	NP	NP	853.11	853.11
	12/8/20	864.89	861.90	NM	10.61	NP	NP	854.28	854.28
LMW-14-15D	6/1/20	865.11	861.66	22.62	--	9.23	13.39	NA	NA
	12/8/20	865.11	861.66	NM	22.79	7.19	15.6	842.32	856.35
LMW-15-16D	6/1/20	865.20	862.24	27.10	27.09	10.71	16.38	838.11	852.84
	12/8/20	865.20	862.24	NM	23.00	9.30	13.7	842.20	854.52

Table 3
LNAPL Thickness, January to December 2020
2020 Annual Groundwater Monitoring Report
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Well ID	Date Collected	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Depth to Water (feet below TOC)	Depth to LNAPL (feet below TOC)	Calculated Thickness NAPL (feet)	Groundwater Elevation (feet msl)	Corrected Groundwater Elevation (feet msl)
Plant 2									
LMW-15-17D	6/1/20	865.21	862.24	NM	10.14	10.13	0.01	855.07	855.08
	12/8/20	865.21	862.24	NM	8.63	NP	NP	856.58	856.58
P2-SB-37	6/1/20	865.90	861.90	NM	6.86	6.04	0.82	859.04	859.78
	12/8/20	865.90	861.90	NM	7.90	6.42	1.48	858.00	859.33
PMW-01	6/1/20	860.85	861.33	NM	3.86	1.69	2.17	856.99	858.94
	12/8/20	860.85	861.33	NM	5.70	1.05	4.65	855.15	859.33
PMW-02	6/1/20	860.94	861.33	NM	1.36	1.33	0.03	859.58	859.61
	12/8/20	860.94	861.33	NM	0.99	0.97	0.02	859.95	859.97
PMW-03	6/1/20	861.59	862.12	NM	1.21	1.20	0.01	860.38	860.39
	12/8/20	861.59	862.12	NM	1.39	NP	NP	860.20	860.20
Plant 3									
LMW-12-09	6/1/20	863.22	860.40	NM	3.33	3.31	0.02	859.89	859.91
LMW-12-10	6/1/20	866.82	863.60	NM	14.91	11.11	3.8	851.91	855.33
LMW-12-11	6/1/20	866.53	863.53	NM	10.72	10.7	0.02	855.81	855.83
UNK-14	6/1/20	859.32	859.70	NM	NM	NM	NM	NM	NM

Notes:
LNAPL = light nonaqueous phase liquid
msl = mean sea level
NAPL = nonaqueous phase liquid
NM = not measured
NP = no product
TOC = top of casing
RACER = Revitalizing Auto Communities Environmental Response
- Where LNAPL was observed, groundwater elevations have been corrected using a measured LNAPL density of 0.8995 gram per milliliter.

Table 4
Groundwater Elevations, January to December 2020
2020 Annual Groundwater Monitoring Report
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

ARCADIS

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
Plant 2								
LMW-12-01	6/1/2020	7	12	864.91	862.14	14.77	8.61	856.30
LMW-12-01	12/8/2020	7	12	864.91	862.14	NM	8.40	856.51
LMW-12-02	6/1/2020	5	10	865.25	862.17	12.90	7.09	858.16
LMW-12-02	12/8/2020	5	10	865.25	862.17	NM	8.45	856.80
LMW-12-03D	6/1/2020	17.3	22.3	864.99	862.08	NM	10.41	854.58*
LMW-12-03D	12/8/2020	17.3	22.3	864.99	862.08	NM	7.76	857.23*
LMW-12-03S	6/1/2020	4	9	864.93	862.06	NM	8.16	856.77*
LMW-12-03S	12/8/2020	4	9	864.93	862.06	NM	5.65	859.28
LMW-12-04	12/8/2020	16	21	864.94	862.12	NM	8.16	856.77*
LMW-12-05	6/1/2020	7	12	865.03	862.17	NM	10.17	854.86*
LMW-12-05	12/8/2020	7	12	865.03	862.17	NM	10.90	854.13*
LMW-12-06	6/1/2020	4	9	865.02	862.15	NM	7.18	857.84*
LMW-12-06	12/8/2020	4	9	865.02	862.15	NM	7.64	857.38
LMW-12-07	6/1/2020	4	9	864.13	861.50	NM	5.62	858.51*
LMW-12-07	12/8/2020	4	9	864.13	861.50	NM	4.44	859.69
LMW-12-08	6/1/2020	8	13	864.40	861.56	NM	8.22	856.18*
LMW-12-08	12/8/2020	8	13	864.40	861.56	NM	5.12	859.28*
LMW-14-12D	6/1/2020	18	23	864.59	862.11	NM	9.89	854.70*
LMW-14-12D	12/8/2020	18	23	864.59	862.11	25.00	8.54	856.05*
LMW-14-13D	12/8/2020	17.5	22.5	865.03	862.06	NM	7.99	857.04
LMW-14-14D	6/1/2020	18	23	864.89	861.90	24.92	11.78	853.11
LMW-14-14D	12/8/2020	18	23	864.89	861.90	NM	10.61	854.28
LMW-14-15D	6/1/2020	18	23	865.11	861.66	22.62	NM	NM
LMW-14-15D	12/8/2020	18	23	865.11	861.66	NM	8.76	856.35*
LMW-15-16D	6/1/2020	19.5	24.5	865.20	862.24	27.10	12.36	852.84*
LMW-15-16D	12/8/2020	19.5	24.5	865.20	862.24	NM	10.68	854.52*
LMW-15-17D	6/1/2020	20	25	865.21	862.24	NM	10.13	855.08*
LMW-15-17D	12/8/2020	20	25	865.21	862.24	NM	8.63	856.58
MW-01(2)	6/1/2020	10	20	875.79	876.10	NM	7.04	868.75
MW-12-01	6/1/2020	87	110	867.94	865.46	95.00	67.89	800.05
MW-12-01	8/26/2020	87	110	867.94	865.46	113.00	69.60	798.34
MW-12-01	11/30/2020	87	110	867.94	865.46	94.00	71.58	796.36
MW-12-02	6/1/2020	87	110	853.91	851.88	96.50	58.61	795.30
MW-12-02	8/26/2020	87	110	853.91	851.88	109.05	62.92	790.99
MW-12-02	11/30/2020	87	110	853.91	851.88	95.07	61.61	792.30
MW-12-05R	6/1/2020	100	112	864.79	862.30	NM	66.96	797.83
MW-12-05R	8/26/2020	100	112	864.79	862.30	112.30	71.20	793.59
MW-12-05R	11/30/2020	100	112	864.79	862.30	108.00	70.57	794.22
MW-12-06	6/1/2020	80.6	99.5	864.64	861.69	88.50	65.99	798.65
MW-12-06	8/26/2020	80.6	99.5	864.64	861.69	103.55	67.85	796.79
MW-12-06	11/30/2020	80.6	99.5	864.64	861.69	88.80	68.20	796.44
MW-12-07	6/1/2020	10	15	872.11	869.21	17.74	6.79	865.32
MW-12-08	6/1/2020	19	24	864.53	861.55	27.20	3.62	860.91
MW-12-09	6/1/2020	14	19	863.54	860.63	22.60	13.49	850.05
MW-12-09	11/30/2020	14	19	863.54	860.63	19.00	14.24	849.30
MW-12-18	6/1/2020	28	33	866.43	864.19	34.80	22.66	843.77
MW-12-18	11/30/2020	28	33	866.43	864.19	33.00	23.72	842.71
MW-13-43	6/1/2020	72	77	863.82	860.97	79.80	63.33	800.49
MW-13-43	8/26/2020	72	77	863.82	860.97	78.54	58.30	805.52
MW-13-43	11/30/2020	72	77	863.82	860.97	79.20	61.25	802.57
MW-13-44	6/1/2020	96	115	864.24	861.03	122.10	63.32	800.92
MW-13-44	8/26/2020	96	115	864.24	861.03	119.05	73.00	791.24
MW-13-44	11/30/2020	96	115	864.24	861.03	122.00	71.83	792.41
MW-13-45	6/1/2020	72	77	863.80	861.54	79.50	63.89	799.91
MW-13-45	11/30/2020	72	77	863.80	861.54	79.10	63.14	800.66
MW-13-51	6/1/2020	77	87	875.34	872.51	91.10	69.00	806.34
MW-14-54	6/1/2020	14	19	865.21	862.21	19.04	12.50	852.71
MW-14-55	6/1/2020	13	18	864.17	861.73	20.10	15.77	848.40
MW-14-56	6/1/2020	71	76	863.27	860.56	NM	63.05	800.22

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ARCADIS

Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
Plant 2 ***(continued)***								
MW-14-56	11/30/2020	71	76	863.27	860.56	76.00	65.01	798.26
MW-14-57	6/1/2020	15	20	863.97	861.10	21.40	12.69	851.28
MW-14-58	6/1/2020	22	27	863.12	860.23	NM	13.87	849.25
MW-14-58	11/30/2020	22	27	863.12	860.23	27.00	14.45	848.67
MW-14-59	6/1/2020	12	17	864.61	861.80	NM	7.38	857.23
MW-14-59	11/30/2020	12	17	864.61	861.80	17.00	7.29	857.32
MW-14-60	6/1/2020	15	20	864.65	861.80	NM	11.84	852.81
MW-14-60	11/30/2020	15	20	864.65	861.80	22.39	11.47	853.18
MW-14-61	3/2/2020	70	75	865.51	862.30	77.49	64.35	801.16
MW-14-61	6/1/2020	70	75	865.51	862.30	NM	64.34	801.17
MW-14-61	8/26/2020	70	75	865.51	862.30	77.40	63.72	801.79
MW-14-61	11/30/2020	70	75	865.51	862.30	75.00	63.89	801.62
MW-14-62	6/1/2020	12	17	865.17	862.25	NM	5.16	860.01
MW-14-62	11/30/2020	12	17	865.17	862.25	17.00	4.56	860.61
MW-14-63	6/1/2020	68	73	854.64	851.68	78.10	58.28	796.36
MW-14-63	8/26/2020	68	73	854.64	851.68	76.68	61.80	792.84
MW-14-63	11/30/2020	68	73	854.64	851.68	77.60	61.38	793.26
MW-15-72	3/2/2020	63	68	865.09	862.35	70.33	57.18	807.91
MW-15-72	6/1/2020	63	68	865.09	862.35	NM	57.58	807.51
MW-15-72	8/26/2020	63	68	865.09	862.35	70.30	55.99	809.10
MW-15-72	11/30/2020	63	68	865.09	862.35	68.00	56.18	808.91
MW-15-73	6/1/2020	78	83	861.56	859.12	82.00	63.60	797.96
MW-16-74	3/2/2020	66	71	864.81	862.10	73.69	62.85	801.96
MW-16-74	6/1/2020	66	71	864.81	862.10	75.30	62.91	801.90
MW-16-74	8/26/2020	66	71	864.81	862.10	73.65	62.98	801.83
MW-16-74	11/30/2020	66	71	864.81	862.10	75.00	62.78	802.03
MW-16-75	6/1/2020	66	71	864.87	862.13	74.90	59.43	805.44
MW-16-75	11/30/2020	66	71	864.87	862.13	75.20	59.59	805.28
MW-16-76	6/1/2020	70	75	867.76	865.12	83.50	61.84	805.92
MW-16-77	6/1/2020	66	71	866.17	863.42	75.20	58.86	807.31
MW-16-77	11/30/2020	66	71	866.17	863.42	74.70	58.65	807.52
MW-16-78	6/1/2020	68	73	864.98	862.09	77.00	61.61	803.37
MW-16-78	11/30/2020	68	73	864.98	862.09	77.00	61.35	803.63
MW-16-79	6/1/2020	68	73	864.80	862.07	77.20	63.02	801.78
MW-16-79	11/30/2020	68	73	864.80	862.07	76.50	62.59	802.21
MW-16-80	6/1/2020	68	73	853.03	853.41	74.90	56.03	797.00
MW-16-80	11/30/2020	68	73	853.03	853.41	74.30	58.76	794.27
MW-16-81	3/2/2020	70	75	864.68	862.04	77.28	62.84	801.84
MW-16-81	6/1/2020	70	75	864.68	862.04	NM	62.86	801.82
MW-16-81	8/26/2020	70	75	864.68	862.04	77.20	61.95	802.73
MW-16-81	11/30/2020	70	75	864.68	862.04	75.00	62.40	802.28
MW-16-82	6/1/2020	70	75	864.79	862.10	78.50	63.81	800.98
MW-16-82	11/30/2020	70	75	864.79	862.10	78.50	63.60	801.19
MW-16-83	8/26/2020	71	76	862.97	860.17	79.00	66.14	796.83
MW-16-83	11/30/2020	71	76	862.97	860.17	80.40	66.80	796.17
MW-16-84	3/2/2020	72	77	864.09	861.81	81.18	64.96	799.13
MW-16-84	6/1/2020	72	77	864.09	861.81	82.70	64.98	799.11
MW-16-84	8/26/2020	72	77	864.09	861.81	81.20	65.29	798.80
MW-16-84	11/30/2020	72	77	864.09	861.81	81.70	66.14	797.95
MW-16-85	6/1/2020	74	79	864.77	861.87	83.10	65.90	798.87
MW-16-85	11/30/2020	74	79	864.77	861.87	83.20	66.67	798.10
MW-17-86	3/2/2020	73	78	864.55	861.92	81.44	63.35	801.20
MW-17-86	6/1/2020	73	78	864.55	861.92	82.50	63.37	801.18
MW-17-86	8/26/2020	73	78	864.55	861.92	81.40	61.99	802.56
MW-17-86	11/30/2020	73	78	864.55	861.92	82.60	62.92	801.63
MW-17-87	6/1/2020	100	112	862.82	860.44	117.00	65.09	797.73
MW-17-87	8/26/2020	100	112	862.82	860.44	117.45	67.62	795.20
MW-17-87	11/30/2020	100	112	862.82	860.44	116.50	67.93	794.89
MW-19-115	3/2/2020	72.5	77.5	865.04	862.19	80.41	57.35	807.69

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Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
Plant 2 ***(continued)***								
MW-19-115	6/1/2020	72.5	77.5	865.04	862.19	81.50	57.64	807.40
MW-19-115	8/26/2020	72.5	77.5	865.04	862.19	80.40	56.82	808.22
MW-19-115	11/30/2020	72.5	77.5	865.04	862.19	81.50	56.95	808.09
MW-19-116	3/2/2020	65	70	865.12	862.17	73.20	57.19	807.93
MW-19-116	6/1/2020	65	70	865.12	862.17	74.80	57.44	807.68
MW-19-116	8/26/2020	65	70	865.12	862.17	73.20	55.75	809.37
MW-19-116	11/30/2020	65	70	865.12	862.17	74.20	56.03	809.09
MW-19-117	3/2/2020	54	59	865.10	862.15	62.89	59.78	805.32
MW-19-117	6/1/2020	54	59	865.10	862.15	63.00	59.93	805.17
MW-19-117	8/26/2020	54	59	865.10	862.15	62.80	58.07	807.03
MW-19-117	11/30/2020	54	59	865.10	862.15	63.20	58.52	806.58
MW-19-118D	3/2/2020	175	190	862.78	859.80	193.00	66.30	796.48
MW-19-118D	6/1/2020	175	190	862.78	859.80	197.00	66.58	796.20
MW-19-118D	8/26/2020	175	190	862.78	859.80	196.00	71.49	791.29
MW-19-118D	11/30/2020	175	190	862.78	859.80	195.50	70.33	792.45
MW-19-118S	3/2/2020	145	160	862.81	859.80	163.00	66.30	796.51
MW-19-118S	6/1/2020	145	160	862.81	859.80	165.00	66.58	796.23
MW-19-118S	8/26/2020	145	160	862.81	859.80	163.00	71.36	791.45
MW-19-118S	11/30/2020	145	160	862.81	859.80	165.20	70.31	792.50
MW-19-120	3/2/2020	66	71	864.67	862.13	74.01	63.46	801.21
MW-19-120	6/1/2020	66	71	864.67	862.13	75.50	63.49	801.18
MW-19-120	8/26/2020	66	71	864.67	862.13	73.95	62.59	802.08
MW-19-120	11/30/2020	66	71	864.67	862.13	75.00	62.97	801.70
MW-19-121	3/2/2020	66	71	864.52	862.19	73.69	62.57	801.95
MW-19-121	6/1/2020	66	71	864.52	862.19	75.00	62.66	801.86
MW-19-121	8/26/2020	66	71	864.52	862.19	73.60	62.85	801.67
MW-19-121	11/30/2020	66	71	864.52	862.19	74.40	62.14	802.38
MW-19-122	3/2/2020	59	64	865.02	862.15	67.00	62.45	802.57
MW-19-122	6/1/2020	59	64	865.02	862.15	67.00	62.45	802.57
MW-19-122	8/26/2020	59	64	865.02	862.15	66.90	61.24	803.78
MW-19-122	11/30/2020	59	64	865.02	862.15	67.70	60.76	804.26
MW-19-123	3/2/2020	66	71	864.45	862.04	74.00	59.89	804.56
MW-19-123	6/1/2020	66	71	864.45	862.04	74.90	59.93	804.52
MW-19-123	8/26/2020	66	71	864.45	862.04	73.82	60.11	804.34
MW-19-123	11/30/2020	66	71	864.45	862.04	68.45	67.11	797.34
MW-19-124	6/5/2020	65	70	864.53	862.22	73.90	62.79	801.74
MW-19-124	8/26/2020	65	70	864.53	862.22	72.20	62.33	802.20
MW-19-124	11/30/2020	65	70	864.53	862.22	73.00	62.31	802.22
MW-19-125	3/2/2020	100	115	865.19	862.16	109.00	68.28	796.91
MW-19-125	6/1/2020	100	115	865.19	862.16	109.50	68.28	796.91
MW-19-125	8/26/2020	100	115	865.19	862.16	109.01	72.55	792.64
MW-19-125	11/30/2020	100	115	865.19	862.16	106.70	71.77	793.42
MW-20-126	8/26/2020	69	74	861.89	859.50	75.50	52.51	809.38
MW-20-126	11/30/2020	69	74	861.89	859.50	76.25	56.20	805.69
MW-20-127	8/26/2020	72	77	862.58	861.30	78.75	59.58	803.00
MW-20-127	11/30/2020	72	77	862.58	861.30	79.80	62.80	799.78
MW-20-128	8/26/2020	65	70	863.73	861.40	70.44	63.80	799.93
MW-20-128	11/30/2020	65	70	863.73	861.40	71.00	63.32	800.41
MW-20-129	8/26/2020	64	69	864.91	862.20	70.95	59.51	805.40
MW-20-129	11/30/2020	64	69	864.91	862.20	71.90	60.17	804.74
MW-20-130	11/30/2020	63	68	863.98	862.20	70.30	62.90	801.08
P2-MW-02	6/1/2020	31	41	872.24	872.70	40.25	36.95	835.29
P2-MW-03	6/1/2020	27	32	854.18	854.66	NM	8.63	845.55
P2-SB-03	6/1/2020	14	19	863.89	861.03	22.11	15.71	848.18
P2-SB-06	6/1/2020	24	29	866.06	862.09	NM	17.57	848.49
P2-SB-20	6/1/2020	8	13	864.46	861.12	NM	8.82	855.64
P2-SB-37	6/1/2020	5	10	861.90	861.90	NM	6.12	855.78*
P2-SB-37	12/8/2020	5	10	861.90	861.90	NM	6.57	855.33*
PMW-01	6/1/2020	2.59	7.59	860.85	861.33	NM	1.91	858.94*

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Plant 2 ***(continued)***								
PMW-01	12/8/2020	2.59	7.59	860.85	861.33	NM	1.52	859.33*
PMW-02	6/1/2020	2.59	7.59	860.94	861.33	NM	1.33	859.61*
PMW-02	12/8/2020	2.59	7.59	860.94	861.33	NM	0.97	859.97*
PMW-03	6/1/2020	1.2	6.2	861.59	862.12	NM	1.64	859.95*
PMW-03	12/8/2020	1.2	6.2	861.59	862.12	NM	1.39	860.20
PW-14-01	6/1/2020	71.6	76.8	864.97	862.38	89.40	61.04	803.93
PW-14-01	11/30/2020	71.6	76.8	864.97	862.38	84.50	61.75	803.22
PW-14-02	6/1/2020	75	80	863.87	860.93	91.20	63.16	800.71
PW-14-02	8/26/2020	75	80	863.87	860.93	85.50	59.23	804.64
PW-14-02	11/30/2020	75	80	863.87	860.93	87.00	62.45	801.42
TW-14-02	3/2/2020	67	72	865.01	862.13	87.34	63.20	801.81
TW-14-02	6/1/2020	67	72	865.01	862.13	75.20	59.39	805.62
TW-14-02	8/26/2020	67	72	865.01	862.13	72.88	59.40	805.61
TW-14-02	11/30/2020	67	72	865.01	862.13	72.50	51.90	813.11
TW-15-12	3/2/2020	73	78	860.88	861.23	80.02	63.40	797.48
TW-15-12	6/1/2020	73	78	860.88	861.23	78.00	60.19	800.69
TW-15-12	8/26/2020	73	78	860.88	861.23	79.50	59.39	801.49
TW-15-12	11/30/2020	73	78	860.88	861.23	80.00	61.95	798.93
Plant 3								
CH-14-RO	6/1/2020	7	12	866.44	863.68	NM	6.79	859.65
CH-14-RO	11/30/2020	7	12	866.44	863.68	NM	8.35	858.09
LMW-12-09	6/1/2020	3	8	863.22	860.40	NM	3.31	859.91*
LMW-12-10	6/1/2020	14	19	866.82	863.60	NM	11.49	855.33*
LMW-12-11	6/1/2020	15	20	866.53	863.53	NM	10.70	855.83*
MW-02-01(3)	6/1/2020	59	69	865.54	863.35	72.50	52.81	812.73
MW-02-02(3)	6/1/2020	74	84	862.70	863.11	84.50	58.20	804.50
MW-02-03(3)	6/1/2020	79	89	859.63	859.90	90.10	55.91	803.72
MW-02-04(3)	6/1/2020	76	86	859.41	859.96	NM	56.10	803.31
MW-02-04(3)	11/30/2020	76	86	859.41	859.96	NM	58.12	801.29
MW-04(3)	6/1/2020	10.5	15.5	859.40	859.79	NM	NM	NM
MW-04-01(3)	8/26/2020	95	105	862.61	862.93	104.55	51.49	811.12
MW-04-01(3)	11/30/2020	95	105	862.61	862.93	104.50	50.91	811.70
MW-04-02(3)	6/2/2020	126	136	861.09	861.26	134.00	58.34	802.75
MW-04-02(3)	8/26/2020	126	136	861.09	861.26	133.35	60.58	800.51
MW-04-02(3)	11/30/2020	126	136	861.09	861.26	133.40	60.67	800.42
MW-04-03(3)	6/2/2020	80	90	860.72	861.00	88.40	57.15	803.57
MW-04-03(3)	8/26/2020	80	90	860.72	861.00	87.30	59.28	801.44
MW-04-03(3)	11/30/2020	80	90	860.72	861.00	87.40	59.45	801.27
MW-04-04(3)	6/1/2020	72	82	855.72	856.11	82.00	52.24	803.48
MW-04-04(3)	8/26/2020	72	82	855.72	856.11	81.65	54.05	801.67
MW-04-04(3)	11/30/2020	72	82	855.72	856.11	81.50	54.43	801.29
MW-05(3)	6/1/2020	10	15	859.02	859.79	NM	NM	NM
MW-12-04	6/2/2020	77	100	844.08	844.26	102.00	42.61	801.47
MW-12-04	8/26/2020	77	100	844.08	844.26	100.25	45.29	798.79
MW-12-04	11/30/2020	77	100	844.08	844.26	NM	44.98	799.10
MW-12-19	6/1/2020	5	10	859.55	859.96	NM	NM	NM
MW-12-20	6/1/2020	75	80	864.20	861.45	NM	60.56	803.64
MW-12-21	6/1/2020	70	75	864.50	861.45	NM	61.63	802.87
MW-12-21	11/30/2020	70	75	864.50	861.45	78.00	62.15	802.35
MW-13-22	3/2/2020	89	94	864.37	861.50	96.00	62.49	801.88
MW-13-22	6/1/2020	89	94	864.37	861.50	NM	62.55	801.82
MW-13-22	8/26/2020	89	94	864.37	861.50	96.15	64.35	800.02
MW-13-22	11/30/2020	89	94	864.37	861.50	96.15	64.16	800.21
MW-13-23	6/1/2020	69	74	864.31	861.45	NM	64.10	800.21
MW-13-24	6/1/2020	69	74	864.35	861.48	NM	60.10	804.25
MW-13-25	6/1/2020	67	72	863.77	860.49	NM	63.63	800.14
MW-13-25	11/30/2020	67	72	863.77	860.49	75.00	62.98	800.79
MW-13-26	6/1/2020	72	77	863.95	861.67	NM	59.46	804.49
MW-13-27	6/2/2020	67	72	864.50	861.54	77.20	64.13	800.37

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Table 4
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Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
Plant 3 ***(continued)***								
MW-13-28	6/1/2020	99	115.5	864.42	861.61	118.68	63.39	801.03
MW-13-28	8/26/2020	99	115.5	864.42	861.61	114.90	65.06	799.36
MW-13-28	11/30/2020	99	115.5	864.42	861.61	117.00	64.74	799.68
MW-13-29	6/1/2020	68	73	862.81	859.81	NM	62.88	799.93
MW-13-30	6/1/2020	72	77	864.53	861.66	NM	61.84	802.69
MW-13-31	6/1/2020	5	10	861.27	858.36	NM	6.33	854.94
MW-13-32	6/1/2020	5	10	860.11	857.32	NM	5.15	854.96
MW-13-34	6/1/2020	74	79	853.92	851.82	80.68	57.35	796.57
MW-13-34	8/26/2020	74	79	853.92	851.82	79.90	60.82	793.10
MW-13-37	6/2/2020	97	112	866.02	863.75	117.50	64.21	801.81
MW-13-37	8/26/2020	97	112	866.02	863.75	114.50	66.66	799.36
MW-13-37	11/30/2020	97	112	866.02	863.75	116.00	66.33	799.69
MW-13-38	6/2/2020	107	124	866.47	863.71	128.00	65.05	801.42
MW-13-38	8/26/2020	107	124	866.47	863.71	126.45	67.56	798.91
MW-13-38	11/30/2020	107	124	866.47	863.71	129.50	67.30	799.17
MW-13-39B	6/1/2020	97	112	860.20	857.33	101.10	59.04	801.16
MW-13-39B	8/26/2020	97	112	860.20	857.33	105.50	51.13	809.07
MW-13-39B	11/30/2020	97	112	860.20	857.33	103.70	61.10	799.10
MW-13-40	6/1/2020	72	77	862.95	859.74	NM	53.95	809.00
MW-13-41	6/1/2020	77	82	866.38	863.68	NM	57.19	809.19
MW-13-41	11/30/2020	77	82	866.38	863.68	85.00	57.04	809.34
MW-13-46	6/1/2020	68	73	854.54	852.12	75.65	56.67	797.87
MW-13-46	8/26/2020	68	73	854.54	852.12	74.70	59.11	795.43
MW-13-46	11/30/2020	68	73	854.54	852.12	74.60	58.89	795.65
MW-13-47	6/1/2020	99	119	853.74	851.89	115.20	56.73	797.01
MW-13-47	8/26/2020	99	119	853.74	851.89	113.70	60.34	793.40
MW-13-47	11/30/2020	99	119	853.74	851.89	113.70	59.52	794.22
MW-13-48	6/1/2020	65	70	854.83	852.17	74.11	55.29	799.54
MW-13-48	11/30/2020	65	70	854.83	852.17	73.00	54.38	800.45
MW-13-49	6/2/2020	73	78	853.01	850.55	NM	57.15	795.86
MW-14-64	6/2/2020	98.6	103.6	864.56	861.77	107.20	62.40	802.16
MW-14-65	6/1/2020	5	10	866.34	863.71	NM	6.47	859.87
MW-15-71	6/1/2020	110	115	864.56	861.58	118.91	61.05	803.51
MW-18-88	6/1/2020	6	11	863.70	860.93	NM	4.83	858.87
MW-18-88	8/26/2020	6	11	863.70	860.93	15.02	6.68	857.02
MW-18-88	11/30/2020	6	11	863.70	860.93	NM	4.33	859.37
MW-18-89	3/2/2020	7	12	866.53	863.51	15.60	7.76	858.77
MW-18-89	6/1/2020	7	12	866.53	863.51	NM	6.02	860.51
MW-18-89	8/26/2020	7	12	866.53	863.51	15.62	9.28	857.25
MW-18-89	11/30/2020	7	12	866.53	863.51	NM	7.90	858.63
MW-18-90	3/2/2020	15	20	866.32	863.25	23.15	9.83	856.49
MW-18-90	6/1/2020	15	20	866.32	863.25	NM	9.32	857.00
MW-18-90	8/26/2020	15	20	866.32	863.25	23.17	11.02	855.30
MW-18-90	11/30/2020	15	20	866.32	863.25	NM	9.80	856.52
MW-18-91	3/2/2020	7	12	865.94	863.43	14.98	5.94	860.00
MW-18-91	6/1/2020	7	12	865.94	863.43	NM	5.50	860.44
MW-18-91	8/26/2020	7	12	865.94	863.43	14.99	7.75	858.19
MW-18-91	11/30/2020	7	12	865.94	863.43	NM	6.71	859.23
MW-18-92	6/1/2020	23	28	870.43	869.08	NM	12.63	857.80
MW-18-92	11/30/2020	23	28	870.43	869.08	NM	18.37	852.06
MW-18-93	6/1/2020	77.5	82.5	863.77	860.99	NM	49.94	813.83
MW-18-93	11/30/2020	77.5	82.5	863.77	860.99	NM	48.61	815.16
MW-18-94	6/1/2020	72	77	866.34	863.86	NM	54.85	811.49
MW-18-94	11/30/2020	72	77	866.34	863.86	NM	53.33	813.01
MW-18-95	3/2/2020	4.5	9.5	864.66	861.76	12.45	6.76	857.90
MW-18-95	6/1/2020	4.5	9.5	864.66	861.76	NM	6.60	858.06
MW-18-95	8/26/2020	4.5	9.5	864.66	861.76	12.45	7.52	857.14
MW-18-95	11/30/2020	4.5	9.5	864.66	861.76	NM	6.81	857.85
MW-18-96	6/1/2020	7	12	864.60	861.64	NM	13.20	851.40

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Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
Plant 3 ***(continued)***								
MW-18-96	11/30/2020	7	12	864.60	861.64	14.79	DRY	DRY
MW-18-97	6/1/2020	85	90	860.91	859.13	NM	58.16	802.75
MW-18-97	11/30/2020	85	90	860.91	859.13	NM	60.10	800.81
MW-18-98	3/2/2020	7	12	862.16	859.10	14.90	4.51	857.65
MW-18-98	6/1/2020	7	12	862.16	859.10	NM	5.74	856.42
MW-18-98	8/26/2020	7	12	862.16	859.10	14.92	7.79	854.37
MW-18-98	11/30/2020	7	12	862.16	859.10	NM	7.79	854.37
MW-18-99	3/2/2020	9	14	862.47	859.95	16.85	6.25	856.22
MW-18-99	6/1/2020	9	14	862.47	859.95	NM	4.11	858.36
MW-18-99	8/26/2020	9	14	862.47	859.95	16.90	6.08	856.39
MW-18-99	11/30/2020	9	14	862.47	859.95	NM	4.73	857.74
MW-18-100	6/1/2020	8	13	863.94	861.49	NM	9.48	854.46
MW-18-100	11/30/2020	8	13	863.94	861.49	NM	10.96	852.98
MW-18-101	6/1/2020	80	85	863.87	861.24	NM	59.71	804.16
MW-18-101	11/30/2020	80	85	863.87	861.24	NM	59.93	803.94
MW-18-102	6/1/2020	10	15	863.13	863.44	NM	7.45	855.68
MW-18-102	11/30/2020	10	15	863.13	863.44	NM	12.42	850.71
MW-18-103	3/3/2020	5	10	859.13	859.74	10.70	0.72	858.41
MW-18-103	6/1/2020	5	10	859.13	859.74	NM	1.75	857.38
MW-18-103	8/26/2020	5	10	859.13	859.74	10.65	5.28	853.85
MW-18-103	11/30/2020	5	10	859.13	859.74	NM	2.35	856.78
MW-18-104	6/1/2020	5	10	859.12	859.82	NM	1.72	857.40
MW-18-104	11/30/2020	5	10	859.12	859.82	NM	3.18	855.94
MW-18-105	3/3/2020	6	11	858.59	859.01	11.20	0.00	858.59
MW-18-105	6/1/2020	6	11	858.59	859.01	NM	0.93	857.66
MW-18-105	8/26/2020	6	11	858.59	859.01	11.18	3.38	855.21
MW-18-105	11/30/2020	6	11	858.59	859.01	NM	1.45	857.14
MW-18-106	6/1/2020	5	10	866.15	866.51	NM	2.91	863.24
MW-18-106	11/30/2020	5	10	866.15	866.51	NM	7.59	858.56
MW-19	6/1/2020	55	65	859.74	859.92	65.00	46.45	813.29
MW-19-107	6/1/2020	23	28	870.65	869.20	NM	14.47	856.18
MW-19-107	11/30/2020	23	28	870.65	869.20	NM	20.34	850.31
MW-19-108	6/1/2020	23	28	872.60	870.22	NM	13.02	859.58
MW-19-108	11/30/2020	23	28	872.60	870.22	NM	19.16	853.44
MW-19-110	6/1/2020	8	13	863.67	860.72	16.24	DRY	DRY
MW-19-110	11/30/2020	8	13	863.67	860.72	16.23	DRY	DRY
MW-19-111	6/1/2020	20	25	874.51	871.70	NM	19.09	855.42
MW-19-111	11/30/2020	20	25	874.51	871.70	NM	22.79	851.72
MW-19-112	6/1/2020	9	14	861.63	858.53	NM	6.32	855.31
MW-19-112	11/30/2020	9	14	861.63	858.53	NM	8.98	852.65
MW-19-113	6/1/2020	16	21	860.67	857.73	NM	23.52	837.15
MW-19-113	11/30/2020	16	21	860.67	857.73	NM	24.47	836.20
MW-19-114	6/1/2020	6	11	861.25	861.79	NM	1.85	859.40
MW-19-114	11/30/2020	6	11	861.25	861.79	NM	2.26	858.99
MW-19-119D	3/2/2020	180	195	864.42	861.66	199.00	74.20	790.22
MW-19-119D	6/2/2020	180	195	864.42	861.66	199.40	74.88	789.54
MW-19-119D	8/26/2020	180	195	864.42	861.66	199.50	80.62	783.80
MW-19-119D	11/30/2020	180	195	864.42	861.66	199.60	78.36	786.06
MW-19-119S	3/2/2020	145	160	864.32	861.66	163.00	63.44	800.88
MW-19-119S	6/2/2020	145	160	864.32	861.66	164.70	62.90	801.42
MW-19-119S	8/26/2020	145	160	864.32	861.66	162.95	65.83	798.49
MW-19-119S	11/30/2020	145	160	864.32	861.66	164.10	65.45	798.87
MW-22	6/1/2020	52.5	62.5	859.69	860.08	64.00	47.32	812.37
MW-23	6/1/2020	52	62	859.45	859.76	NM	NM	NM
MW-23	11/30/2020	52	62	859.45	859.76	NM	NM	NM
MW-88-1	6/1/2020	103.5	140	858.75	859.06	138.60	60.92	797.83
MW-88-1	8/26/2020	103.5	140	858.75	859.06	138.65	63.11	795.64
MW-88-1	11/30/2020	103.5	140	858.75	859.06	138.70	63.17	795.58
MW-91-2R	6/1/2020	75	80	866.84	863.63	NM	57.54	809.30

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Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
Plant 3 ***(continued)***								
MW-91-2R	11/30/2020	75	80	866.84	863.63	NM	56.62	810.22
MW-91-3	6/1/2020	105	117	860.81	859.35	120.00	61.81	799.00
MW-91-3	8/26/2020	105	117	860.81	859.35	119.20	63.29	797.52
MW-91-3	11/30/2020	105	117	860.81	859.35	120.20	63.78	797.03
MW-91-4	6/1/2020	116	132.5	855.59	855.93	132.00	53.90	801.69
MW-91-4	8/26/2020	116	132.5	855.59	855.93	132.05	55.86	799.73
MW-91-4	11/30/2020	116	132.5	855.59	855.93	132.25	55.78	799.81
MW-91-5	6/2/2020	112.5	128	860.61	861.20	128.54	56.82	803.79
MW-91-5	8/26/2020	112.5	128	860.61	861.20	127.75	58.88	801.73
MW-91-5	11/30/2020	112.5	128	860.61	861.20	128.00	59.02	801.59
MW-91-6	6/2/2020	82	98	851.84	852.22	97.60	53.77	798.07
MW-91-6	8/26/2020	82	98	851.84	852.22	96.15	56.92	794.92
MW-91-6	11/30/2020	82	98	851.84	852.22	96.00	56.40	795.44
MW-93-1	6/1/2020	65	75	866.05	863.56	71.00	60.40	805.65
MW-93-1	8/26/2020	65	75	866.05	863.56	70.20	60.52	805.53
P3-SB-07	6/1/2020	11	16	866.84	863.63	NM	8.08	858.76
P3-SB-07	11/30/2020	11	16	866.84	863.63	19.62	8.79	858.05
P3-SB-28	6/1/2020	8	13	866.43	863.63	NM	5.53	860.90
PW-14-03	3/2/2020	85	90	864.31	861.55	95.00	64.23	800.08
PW-14-03	6/1/2020	85	90	864.31	861.55	100.21	65.10	799.21
PW-14-03	8/26/2020	85	90	864.31	861.55	95.50	66.95	797.36
PW-14-03	11/30/2020	85	90	864.31	861.55	97.00	66.61	797.70
TW-14-06	3/2/2020	82	87	864.30	861.50	86.50	54.90	809.40
TW-14-06	6/1/2020	82	87	864.30	861.50	88.19	64.72	799.58
TW-14-06	8/26/2020	82	87	864.30	861.50	86.80	42.20	822.10
TW-14-06	11/30/2020	82	87	864.30	861.50	87.35	32.17	832.13
TW-14-07	11/30/2020	83	88	864.45	861.44	94.50	66.59	797.86
TW-15-11	3/2/2020	85	90	864.51	861.60	87.00	63.79	800.72
TW-15-11	6/1/2020	85	90	864.51	861.60	87.05	64.93	799.58
TW-15-11	8/26/2020	85	90	864.51	861.60	87.00	65.62	798.89
TW-15-11	11/30/2020	85	90	864.51	861.60	87.54	65.88	798.63
UNK-10	6/1/2020	11	16	859.34	860.05	NM	0.05	859.29
UNK-11	6/1/2020	6.5	11.5	859.91	860.17	NM	0.65	859.26
UNK-13	6/1/2020	11	16	859.11	859.91	NM	NM	NM
UNK-14	6/1/2020	10.4	15.4	859.32	859.70	NM	NM	NM
UNK-15	3/2/2020	11	16	859.56	859.94	15.65	0.39	859.17
UNK-15	6/1/2020	11	16	859.56	859.94	NM	0.56	859.00
UNK-15	6/5/2020	11	16	859.56	859.94	NM	0.50	859.06
UNK-15	8/26/2020	11	16	859.56	859.94	15.63	1.53	858.03
UNK-15	11/30/2020	11	16	859.56	859.94	NM	0.52	859.04
Plant 6								
MW-02-03(6)	6/1/2020	35	45	869.54	869.97	44.80	28.06	841.48
MW-03-02	6/1/2020	30	40	864.52	864.76	39.67	21.55	842.97
MW-03-04	6/1/2020	33	43	865.28	865.53	42.81	22.00	843.28
MW-03-05	6/1/2020	35	45	868.90	869.14	48.51	23.23	845.67
MW-03-06	6/1/2020	30	40	870.45	870.80	41.00	36.05	834.40
MW-03-07	6/8/2020	30	40	866.88	867.02	41.00	25.84	841.04
MW-03-08	6/1/2020	35	45	869.03	869.39	45.10	33.19	835.84
MW-04-01(6)	6/1/2020	78	88	866.85	867.15	89.31	65.58	801.27
MW-04-01(6)	8/26/2020	78	88	866.85	867.15	87.70	66.14	800.71
MW-04-01(6)	11/30/2020	78	88	866.85	867.15	87.85	66.37	800.48
MW-04-04R	6/1/2020	82	110	873.31	870.64	113.00	71.75	801.56
MW-04-04R	8/26/2020	82	110	873.31	870.64	110.90	72.35	800.96
MW-04-04R	11/30/2020	82	110	873.31	870.64	108.00	72.51	800.80
MW-04-05(6)	6/1/2020	20	30	858.33	858.87	29.60	9.69	848.64
MW-04-06R	6/1/2020	74	99.5	861.56	858.59	79.80	60.95	800.61
MW-04-06R	8/26/2020	74	99.5	861.56	858.59	77.79	61.75	799.81
MW-04-06R	11/30/2020	74	99.5	861.56	858.59	78.20	61.32	800.24
MW-12-03	6/1/2020	57	80	859.10	856.71	85.05	58.98	800.12

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Well ID	Date Collected	Screened Interval Top (feet bgs)	Screened Interval Bottom (feet bgs)	Reference Elevation (TOC)	Ground Surface Elevation (feet msl)	Total Well Depth (feet below TOC)	Corrected Depth to Water (feet below TOC)	Corrected Groundwater Elevation (feet msl)
Plant 6 ***(continued)***								
MW-12-03	8/26/2020	57	80	859.10	856.71	82.24	59.11	799.99
MW-12-03	11/30/2020	57	80	859.10	856.71	83.60	59.18	799.92
MW-12-10R	6/1/2020	10	15	862.29	858.92	18.01	10.62	851.67
MW-12-11	6/1/2020	13	18	857.26	857.68	16.80	3.20	854.06
MW-12-12	3/2/2020	13	18	874.34	874.61	17.20	7.08	867.26
MW-12-12	6/1/2020	13	18	874.34	874.61	17.20	5.00	869.34
MW-12-12	8/26/2020	13	18	874.34	874.61	17.19	8.85	865.49
MW-12-12	11/30/2020	13	18	874.34	874.61	17.20	7.74	866.60
MW-12-13	3/2/2020	18.5	23.5	882.60	880.51	25.50	9.32	873.28
MW-12-13	6/1/2020	18.5	23.5	882.60	880.51	25.50	9.75	872.85
MW-12-13	8/26/2020	18.5	23.5	882.60	880.51	25.42	12.58	870.02
MW-12-13	11/30/2020	18.5	23.5	882.60	880.51	25.45	10.25	872.35
MW-12-14	6/1/2020	25	30	872.56	869.28	32.10	23.66	848.90
MW-12-16	6/1/2020	28	33	864.24	864.73	32.40	22.30	841.94
MW-13-35	8/26/2020	25	30	864.81	865.23	29.46	22.96	841.85
MW-13-35	11/30/2020	25	30	864.81	865.23	29.50	22.67	842.14
MW-13-36R	3/2/2020	5.5	10.5	878.04	875.28	12.70	4.25	873.79
MW-13-36R	6/1/2020	5.5	10.5	878.04	875.28	12.60	5.20	872.84
MW-13-36R	8/26/2020	5.5	10.5	878.04	875.28	12.74	7.58	870.46
MW-13-36R	11/30/2020	5.5	10.5	878.04	875.28	12.70	5.41	872.63
MW-13-50	6/1/2020	85	107	872.85	869.93	113.00	71.75	801.10
MW-13-50	8/26/2020	85	107	872.85	869.93	109.74	75.65	797.20
MW-13-50	11/30/2020	85	107	872.85	869.93	NM	75.39	797.46
MW-13-52	6/1/2020	70	80	872.50	869.84	82.30	67.15	805.35
MW-13-52	8/26/2020	70	80	872.50	869.84	81.35	67.27	805.23
MW-13-52	11/30/2020	70	80	872.50	869.84	81.40	67.26	805.24
MW-13-53	6/1/2020	73	83	875.56	873.10	86.10	70.40	805.16
MW-14-66	6/1/2020	14	19	877.85	874.73	22.22	4.65	873.20
MW-14-67	3/2/2020	13	18	877.76	875.07	20.80	4.56	873.20
MW-14-67	6/1/2020	13	18	877.76	875.07	20.80	4.82	872.94
MW-14-67	8/26/2020	13	18	877.76	875.07	20.81	6.88	870.88
MW-14-67	11/30/2020	13	18	877.76	875.07	20.80	5.01	872.75
MW-14-68	6/1/2020	36	41	878.44	875.42	44.30	44.05	834.39
MW-14-69	6/1/2020	41	46	883.62	880.72	49.00	DRY	DRY
MW-14-70	3/2/2020	16	21	882.79	880.08	23.10	9.51	873.28
MW-14-70	6/1/2020	16	21	882.79	880.08	23.10	9.93	872.86
MW-14-70	8/26/2020	16	21	882.79	880.08	23.10	13.12	869.67
MW-14-70	11/30/2020	16	21	882.79	880.08	23.10	10.65	872.14
MW-20-131	11/30/2020	5	10	NS	NS	13.70	8.52	-8.52
MW-20-132	11/30/2020	6	11	NS	NS	10.75	5.03	-5.03
MWBP-10-UST5-6	6/1/2020	28	38	867.70	867.99	37.04	29.47	838.23
MWBP-11-UST1-4	6/1/2020	9	19	868.66	869.07	11.21	1.17	867.49
MWBP-12-UST1-4	6/1/2020	15	25	870.02	870.58	11.40	1.82	868.20
P6-MW-01	6/1/2020	23	28	870.10	866.87	31.20	28.00	842.10
P6-SB-07	3/2/2020	15	20	877.36	874.36	23.60	5.14	872.22
P6-SB-07	6/1/2020	15	20	877.36	874.36	23.60	5.69	871.67
P6-SB-07	8/26/2020	15	20	877.36	874.36	23.59	8.68	868.68
P6-SB-07	11/30/2020	15	20	877.36	874.36	23.60	5.58	871.78
P6-SB-18	6/1/2020	3	8	878.46	874.60	12.15	5.00	873.46
P6-SB-21	6/1/2020	3	8	874.20	870.92	11.13	2.84	871.36
P6-SB-35	6/1/2020	3	8	877.76	874.28	12.01	4.38	873.38
P6-SB-37	6/1/2020	5	10	878.12	874.32	13.90	4.62	873.50

See Notes on last page.

Table 4
Groundwater Elevations, January to December 2020
2020 Annual Groundwater Monitoring Report
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Notes:

* Groundwater elevations have been corrected for the presence of LNAPL using a measured LNAPL density of 0.8995 gram per milliliter.

bgs = below ground surface

DRY = well was dry and depth to water could not be gauged

LNAPL = light nonaqueous phase liquid

msl = mean sea level

NM = not measured

NS = not surveyed

RACER = Revitalizing Auto Communities Environmental Response

TOC = top of casing

Table 5
Bedrock Vertical Gradients - Fourth Quarter 2020
2020 Annual Groundwater Monitoring Report
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

		Screen (feet below grade)			Reference Elevation (feet amsl)	Groundwater Elevation 11/30/2020 (feet amsl)	Vertical Gradient (ft/ft)	Formation
		Top	Bottom	Mid-point				
Plant 2								
MW-14-63	Weathered Bedrock	68	73	70.5	854.64	793.26	0.03	Grand River Formation
MW-12-02	Bedrock	87	110	98.5	853.91	792.30		
MW-13-43	Weathered Bedrock	72	77	74.5	863.82	802.57	0.33	Saginaw Formation
MW-13-44	Bedrock	96	115	105.5	864.24	792.41		
MW-14-61	Weathered Bedrock	70	75	72.5	865.51	801.62	0.30	Saginaw Formation
MW-12-06	Bedrock	80.6	99.5	90.1	864.64	796.44		
MW-15-72	Weathered Bedrock	63	68	65.5	865.09	808.91	0.36	Saginaw Formation
MW-12-05R	Bedrock	100	112	106.0	864.79	794.22		
Plant 3								
MW-13-22	Weathered Bedrock	89	94	91.5	864.37	800.21	0.03	Grand River Formation
MW-13-28	Bedrock	99	115.5	107.3	864.42	799.68		
MW-13-46	Weathered Bedrock	68	73	70.5	854.54	795.65	0.01	Grand River Formation
MW-91-6	Bedrock	82	98	90	851.84	795.44		
MW-04-03(3)	Deep Overburden	80	90	85	860.72	801.27	0.02	Grand River Formation
MW-04-02(3)	Bedrock	126	136	131	861.09	800.42		
MW-04-04(3)	Deep Overburden	72	82	77	855.72	801.29	0.03	Grand River Formation
MW-91-4	Bedrock	116	132.5	124.3	855.59	799.81		
MW-13-41	Deep Overburden	77	82	79.5	866.38	809.34	0.28	Saginaw Formation
MW-13-38	Bedrock	107	124	115.5	866.47	799.17		
Plant 6								
MW-13-52	Weathered Bedrock	70	80	75	872.50	805.24	0.37	Saginaw Formation
MW-13-50	Bedrock	85	107	96	872.85	797.46		

Notes:
ft/ft = foot per foot
GR Fm = Grand River Formation
amsl = above mean sea level
RACER = Revitalizing Auto Communities Environmental Response
Sag Fm = Saginaw Formation
W. Bedrock = weathered bedrock

Vertical Gradient Geometric Mean Sag Fm	0.33
Vertical Gradient Geometric Mean GR Fm	0.02

Table 6
Mann-Kendall Trend Analysis Results Summary Table
2020 Annual Groundwater Monitoring Report
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Monitoring Well ID	Plant Number	Constituent	Start Date	End Date	Minimum Concentration	Maximum Concentration	Most Recent Concentration	Concentration Units	Sample Size (*n*)	% of Detections	Coefficient of Variation (CV)	Sum of Trend (*S-statistic*)	Probability (*p-value*)	Standard Deviation	Arithmetic Mean	Geometric Mean	Mann-Kendall Trend Result
Perched Wells																	
Volatile Organic Compounds																	
MW-02-03(6)	6	1,4-Dioxane	10/18/2011	06/03/2020	13	21	15	µg/L	15	100%	0.14	22	0.145	2.2636	16.470	16.322	NO SIGNIFICANT TREND
MW-02-03(6)	6	Vinyl Chloride	10/18/2011	06/03/2020	<1	3	<1	µg/L	15	73%	0.45	2	0.479	0.6325	1.400	1.294	NO SIGNIFICANT TREND
MW-03-06	6	1,4-Dioxane	10/07/2011	06/02/2020	5	10	5	µg/L	15	100%	0.22	-53	0.004	1.5946	7.400	7.244	DECREASING TREND
MW-03-06	6	Vinyl Chloride	10/07/2011	06/02/2020	<1	12	12	µg/L	15	87%	0.47	2	0.480	4.0320	8.600	6.891	NO SIGNIFICANT TREND
MW-14-54	2	Benzene	09/19/2014	06/09/2020	2	770	620	µg/L	10	100%	0.81	15	0.108	282.0633	346.200	155.600	NO SIGNIFICANT TREND
MW-14-54	2	Ethylbenzene	09/19/2014	06/09/2020	2	1,710	1,710	µg/L	10	100%	0.87	23	0.023	666.7924	766.400	236.610	INCREASING TREND
MW-14-54	2	Isopropyl Benzene	09/19/2014	06/09/2020	<1	70	70	µg/L	10	70%	0.87	25	0.014	26.8388	30.900	12.884	INCREASING TREND
MW-14-54	2	Total Xylenes	09/19/2014	06/09/2020	<2	1,360	1,360	µg/L	10	90%	0.69	25	0.014	437.8811	631.900	320.750	INCREASING TREND
MW-14-58	2	1,4-Dioxane	09/17/2014	06/09/2020	14	78	38	µg/L	13	100%	0.41	17	0.164	19.2467	46.460	42.040	NO SIGNIFICANT TREND
MW-14-59	2	1,1-Dichloroethene	09/18/2014	06/09/2020	16	39	19	µg/L	10	100%	0.29	-20	0.045	7.4394	25.700	24.743	DECREASING TREND
MW-14-59	2	1,4-Dioxane	09/18/2014	06/09/2020	41	280	56	µg/L	10	100%	0.61	-38	0.000	92.5659	151.000	122.407	DECREASING TREND
MW-14-60	2	1,4-Dioxane	09/19/2014	06/09/2020	97	200	107	µg/L	10	100%	0.23	-39	0.000	32.4498	142.900	139.582	DECREASING TREND
MW-14-60	2	Vinyl Chloride	09/19/2014	06/09/2020	2	12	5	µg/L	10	100%	0.61	20	0.045	3.4383	5.600	4.722	INCREASING TREND
MW-14-62	2	1,4-Dioxane	09/19/2014	06/09/2020	27	230	27	µg/L	10	100%	0.79	-23	0.023	72.2041	91.100	70.102	DECREASING TREND
MWBP-12-UST1-4	6	Benzene	10/18/2011	06/02/2020	<1	284	<1	µg/L	14	71%	1.42	42	0.011	84.3613	59.290	13.804	INCREASING TREND
P2-MW-04	2	1,4-Dioxane	08/25/2011	06/10/2020	<5	62	31	µg/L	12	92%	0.45	-22	0.074	18.4957	41.500	34.530	DECREASING TREND
Metals																	
CH-14-RO	3	Chromium (III)	08/22/2011	06/08/2020	7.21	27.1	7.21	mg/L	15	100%	0.39	-88	0.000	6.1921	16.020	14.818	DECREASING TREND
CH-14-RO	3	Chromium (VI)	08/22/2011	06/08/2020	6.68	28.4	8	mg/L	15	100%	0.41	-89	0.000	6.8663	16.720	15.333	DECREASING TREND
MW-13-32	3	Chromium (III)	08/27/2013	06/08/2020	<0.005	1.43	0.041	mg/L	20	75%	1.91	-56	0.036	0.3247	0.170	0.041	DECREASING TREND
MW-13-32	3	Copper	08/27/2013	06/08/2020	<0.005	0.067	0.005	mg/L	20	85%	0.77	-108	0.000	0.0155	0.020	0.012	DECREASING TREND
MW-13-32	3	Nickel	08/27/2013	06/08/2020	0.043	4.66	0.185	mg/L	20	100%	0.98	-44	0.081	1.1923	1.220	0.758	DECREASING TREND
MW-13-36R	6	Vanadium	12/18/2013	06/04/2020	<0.005	0.027	0.005	mg/L	17	94%	0.54	-2	0.483	0.0054	0.010	0.010	NO SIGNIFICANT TREND
MWBP-10-UST5-6	6	Arsenic	10/07/2011	06/04/2020	<0.002	0.051	0.012	mg/L	19	84%	1.29	98	0.000	0.0129	0.010	0.007	INCREASING TREND
MWBP-11-UST1-4	6	Arsenic	11/29/2011	06/02/2020	0.012	0.032	0.012	mg/L	13	100%	0.33	-43	0.005	0.0066	0.020	0.020	DECREASING TREND
MWBP-11-UST1-4	6	Copper	11/29/2011	06/02/2020	<0.005	0.032	<0.005	mg/L	13	92%	0.77	-52	0.001	0.0077	0.010	0.010	DECREASING TREND
MWBP-12-UST1-4	6	Arsenic	10/18/2011	06/02/2020	0.006	0.018	0.01	mg/L	13	100%	0.39	1	0.500	0.0039	0.010	0.012	NO SIGNIFICANT TREND
MWBP-12-UST1-4	6	Vanadium	10/18/2011	06/02/2020	0.003	0.011	0.01	mg/L	13	92%	0.23	15	0.191	0.0023	0.010	0.008	NO SIGNIFICANT TREND

Table 6
Mann-Kendall Trend Analysis Results Summary Table
2020 Annual Groundwater Monitoring Report
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Monitoring Well ID	Plant Number	Constituent	Start Date	End Date	Minimum Concentration	Maximum Concentration	Most Recent Concentration	Concentration Units	Sample Size (*n*)	% of Detections	Coefficient of Variation (CV)	Sum of Trend (*S-statistic*)	Probability (*p-value*)	Standard Deviation	Arithmetic Mean	Geometric Mean	Mann-Kendall Trend Result
Per- and polyfluoroalkyl substances (PFAS)																	
CH-14-RO	3	PFOS	12/16/2016	12/08/2020	9,390	13,000	9,390	ng/L	8	100%	0.11	-8	0.199	1,313.8595	11,636.250	11,567.714	NO SIGNIFICANT TREND
CH-14-RO	3	PFOA	12/16/2016	12/08/2020	69.2	190.0	84.7	ng/L	8	100%	0.34	-13	0.072	37.6032	112.030	107.079	DECREASING TREND
CH-14-RO	3	PFHxS	12/16/2016	12/08/2020	1,400	2,520	1,400	ng/L	8	100%	0.23	-20	0.007	442.5232	1,923.750	1,879.985	DECREASING TREND
MW-12-09	2	PFOA	06/05/2018	12/04/2020	11.90	15.40	15.4	ng/L	5	100%	0.11	2	0.408	1.4772	13.580	13.516	NO SIGNIFICANT TREND
MW-12-12	6	PFOS	06/05/2018	12/02/2020	40.60	67.50	66	ng/L	8	100%	0.20	8	0.199	10.2250	52.240	51.401	NO SIGNIFICANT TREND
MW-12-12	6	PFOA	06/05/2018	12/02/2020	60.90	130.00	91.2	ng/L	8	100%	0.27	-8	0.199	24.5666	89.650	86.829	NO SIGNIFICANT TREND
MW-12-12	6	PFNA	06/12/2019	12/02/2020	7.70	12.60	9.8	ng/L	7	100%	0.20	-5	0.281	1.9949	10.080	9.905	NO SIGNIFICANT TREND
MW-13-36R	6	PFOS	06/12/2019	12/02/2020	44.50	56.70	53.1	ng/L	7	100%	0.09	3	0.386	4.5959	49.570	49.392	NO SIGNIFICANT TREND
MW-13-36R	6	PFOA	06/12/2019	12/02/2020	57.10	75.20	75.2	ng/L	7	100%	0.11	11	0.068	7.0687	64.600	64.275	INCREASING TREND
MW-13-36R	6	PFNA	06/12/2019	12/02/2020	11.00	14.50	13.7	ng/L	7	100%	0.11	-3	0.386	1.3438	12.770	12.710	NO SIGNIFICANT TREND
MW-14-58	2	PFOA	05/09/2018	12/04/2020	4.30	11.10	4.3	ng/L	5	100%	0.31	-6	0.117	2.5067	7.980	7.615	NO SIGNIFICANT TREND
MW-14-59	2	PFOA	06/06/2018	12/04/2020	6.70	10.10	8.8	ng/L	5	100%	0.15	-4	0.242	1.2349	8.500	8.425	NO SIGNIFICANT TREND
MW-14-60	2	PFOS	05/09/2018	12/04/2020	5.60	35.50	5.6	ng/L	5	80%	0.66	-6	0.117	14.1088	21.320	17.154	NO SIGNIFICANT TREND
MW-14-60	2	PFOA	05/09/2018	12/04/2020	14.70	33.60	17.4	ng/L	5	100%	0.35	-6	0.117	7.8080	22.600	21.573	NO SIGNIFICANT TREND
MW-14-62	2	PFOS	05/09/2018	12/04/2020	50.20	86.80	75.6	ng/L	5	100%	0.19	0	0.592	13.3661	69.920	68.831	NO SIGNIFICANT TREND
MW-14-62	2	PFOA	05/09/2018	12/04/2020	36.50	94.30	47.5	ng/L	5	100%	0.37	-8	0.042	22.8598	61.480	58.186	DECREASING TREND
MW-14-62	2	PFNA	05/09/2018	12/04/2020	5.10	11.90	7.3	ng/L	5	100%	0.32	-8	0.042	2.7146	8.470	8.110	DECREASING TREND
MW-14-67	6	PFOA	06/06/2019	12/02/2020	10.30	27.10	27.1	ng/L	7	100%	0.44	3	0.386	6.3868	14.510	13.575	NO SIGNIFICANT TREND
MW-14-70	6	PFOA	05/10/2018	12/02/2020	6.60	42.80	7.4	ng/L	8	100%	0.55	-8	0.199	14.8377	27.010	21.938	NO SIGNIFICANT TREND
MW-18-88	3	PFOS	12/05/2018	12/07/2020	46.10	271.00	155	ng/L	8	100%	0.60	4	0.360	72.5694	121.330	105.349	NO SIGNIFICANT TREND
MW-18-88	3	PFOA	12/05/2018	12/07/2020	3.10	8.80	6.1	ng/L	8	100%	0.43	10	0.138	2.2587	5.260	4.877	NO SIGNIFICANT TREND
MW-18-89	3	PFOS	12/05/2018	12/08/2020	108.00	289.00	176	ng/L	8	100%	0.33	2	0.452	55.1839	164.880	158.255	NO SIGNIFICANT TREND
MW-18-89	3	PFOA	12/05/2018	12/08/2020	10.10	21.40	17.1	ng/L	8	100%	0.24	2	0.452	3.5729	14.840	14.465	NO SIGNIFICANT TREND
MW-18-90	3	PFOS	12/06/2018	12/07/2020	920.00	1,100.00	1,060	ng/L	8	100%	0.06	6	0.274	64.1494	989.000	987.221	NO SIGNIFICANT TREND
MW-18-90	3	PFOA	12/06/2018	12/07/2020	12.60	21.30	17.8	ng/L	8	100%	0.19	-10	0.138	3.3060	17.510	17.221	NO SIGNIFICANT TREND
MW-18-91	3	PFOS	12/06/2018	12/07/2020	47.10	76.00	60.7	ng/L	8	100%	0.16	-8	0.199	9.6652	61.640	60.965	NO SIGNIFICANT TREND
MW-18-91	3	PFOA	12/06/2018	12/07/2020	7.90	10.90	8.7	ng/L	8	100%	0.13	-4	0.360	1.1657	9.180	9.121	NO SIGNIFICANT TREND
MW-18-95	3	PFOS	03/05/2019	12/07/2020	37.30	115.00	39	ng/L	8	100%	0.52	-20	0.007	31.3261	60.290	54.648	DECREASING TREND
MW-18-95	3	PFOA	03/05/2019	12/07/2020	3.70	16.60	4.9	ng/L	8	100%	0.64	-14	0.054	4.5237	7.120	6.184	DECREASING TREND
MW-18-98	3	PFOS	03/05/2019	12/01/2020	63.80	203.00	80.9	ng/L	9	100%	0.39	-12	0.130	43.2943	110.100	103.513	NO SIGNIFICANT TREND
MW-18-98	3	PFOA	03/05/2019	12/01/2020	9.08	42.00	31.4	ng/L	9	100%	0.46	-10	0.179	12.1727	26.340	23.157	NO SIGNIFICANT TREND
MW-18-99	3	PFOS	03/05/2019	12/02/2020	46.70	130.00	130	ng/L	9	100%	0.33	10	0.179	26.6751	81.320	77.607	NO SIGNIFICANT TREND
MW-18-99	3	PFOA	03/05/2019	12/02/2020	3.90	9.80	9.8	ng/L	9	100%	0.24	0	0.540	1.7560	7.170	6.958	NO SIGNIFICANT TREND
MW-18-103	3	PFHxS	03/04/2019	12/07/2020	16.80	61.80	61.8	ng/L	8	100%	0.49	6	0.274	14.7852	29.930	27.365	NO SIGNIFICANT TREND
MW-18-105	3	PFOS	03/04/2019	12/07/2020	3.28	23.80	10.5	ng/L	9	100%	0.56	10	0.179	5.6912	10.180	9.026	NO SIGNIFICANT TREND
P6-SB-07	6	PFOS	06/07/2018	12/02/2020	47.40	126.00	126	ng/L	8	100%	0.36	4	0.360	27.3284	76.510	72.633	NO SIGNIFICANT TREND
P6-SB-07	6	PFOA	06/07/2018	12/02/2020	688.00	1,780.00	1,780	ng/L	8	100%	0.32	2	0.452	404.1039	1,247.750	1,186.735	NO SIGNIFICANT TREND
P6-SB-07	6	PFNA	06/06/2019	08/31/2020	74.60	163.00	154	ng/L	6	100%	0.33	-1	0.500	37.0568	112.200	107.446	NO SIGNIFICANT TREND
UNK-15	3	PFOS	06/10/2019	12/08/2020	810.00	1,530.00	1,220	ng/L	7	100%	0.22	-3	0.386	262.3063	1,197.570	1,171.138	NO SIGNIFICANT TREND
UNK-15	3	PFOA	06/10/2019	12/08/2020	26.60	49.10	33.9	ng/L	7	100%	0.20	-11	0.068	7.5820	37.900	37.234	DECREASING TREND
UNK-15	3	PFNA	06/10/2019	12/08/2020	3.30	6.94	4.9	ng/L	7	100%	0.23	-9	0.119	1.2346	5.380	5.250	NO SIGNIFICANT TREND

Table 6
Mann-Kendall Trend Analysis Results Summary Table
2020 Annual Groundwater Monitoring Report
RACER Trust Plants 2, 3, and 6
Lansing, Michigan

Monitoring Well ID	Plant Number	Constituent	Start Date	End Date	Minimum Concentration	Maximum Concentration	Most Recent Concentration	Concentration Units	Sample Size (*n*)	% of Detections	Coefficient of Variation (CV)	Sum of Trend (*S-statistic*)	Probability (*p-value*)	Standard Deviation	Arithmetic Mean	Geometric Mean	Mann-Kendall Trend Result
Weathered Bedrock and Deep Overburden Wells																	
Volatile Organic Compounds																	
MW-12-21	3	1,4-Dioxane	02/08/2013	12/08/2020	<5	510	310	µg/L	20	95%	0.40	-83	0.004	127.1624	319.800	259.558	DECREASING TREND
MW-13-22	3	1,4-Dioxane	03/28/2013	12/01/2020	52	270	162	µg/L	23	100%	0.32	-18	0.327	53.5501	168.610	158.025	NO SIGNIFICANT TREND
MW-13-25	3	1,4-Dioxane	04/02/2013	12/08/2020	3	25	17	µg/L	20	90%	0.54	11	0.372	6.3484	11.750	9.954	NO SIGNIFICANT TREND
MW-13-29	3	1,4-Dioxane	04/23/2013	06/10/2020	15	130	35	µg/L	15	100%	0.91	-37	0.037	28.2590	31.000	25.797	DECREASING TREND
MW-13-34	3	1,4-Dioxane	08/20/2013	12/01/2020	17	106	106	µg/L	21	100%	0.32	130	0.000	22.5949	69.860	65.411	INCREASING TREND
MW-13-41	3	1,4-Dioxane	12/17/2013	06/10/2019	11	23	23	µg/L	12	100%	0.27	17	0.129	4.0899	15.000	14.513	NO SIGNIFICANT TREND
MW-13-43	2	1,4-Dioxane	12/13/2013	12/04/2020	15	360	15	µg/L	21	100%	0.26	-22	0.262	71.6592	273.380	246.443	NO SIGNIFICANT TREND
MW-13-45	2	1,4-Dioxane	12/13/2013	12/04/2020	<3	58	58	µg/L	21	95%	0.32	69	0.020	13.7243	42.430	37.877	INCREASING TREND
MW-13-48	3	1,4-Dioxane	12/19/2013	12/07/2020	34	380	137	µg/L	20	100%	0.52	24	0.228	87.1384	168.600	145.158	NO SIGNIFICANT TREND
MW-14-56	2	1,4-Dioxane	09/18/2014	06/08/2020	<5	14	12	µg/L	16	88%	0.29	72	0.001	2.4005	8.190	7.891	INCREASING TREND
MW-14-61	2	1,4-Dioxane	09/19/2014	12/02/2020	<3	152	18	µg/L	15	80%	1.09	42	0.021	66.6373	61.330	24.187	INCREASING TREND
MW-15-72	2	1,4-Dioxane	03/16/2016	12/03/2020	30	310	270	µg/L	17	100%	0.38	2	0.484	82.0434	216.650	192.410	NO SIGNIFICANT TREND
MW-15-73	2	1,4-Dioxane	03/15/2016	06/08/2020	<3	11	10	µg/L	10	80%	0.40	31	0.002	2.6331	6.600	6.129	INCREASING TREND
MW-16-80	2	1,4-Dioxane	06/28/2016	12/04/2020	<3	46	28	µg/L	11	91%	0.48	-1	0.500	11.3698	23.550	19.531	NO SIGNIFICANT TREND
MW-16-81	2	1,4-Dioxane	06/28/2016	12/03/2020	100	3,200	1,930	µg/L	18	100%	0.80	87	0.001	1,039.3921	1,297.780	855.356	INCREASING TREND
MW-16-84	2	1,4-Dioxane	09/23/2016	12/01/2020	29	81	81	µg/L	17	100%	0.25	72	0.002	13.8110	54.650	52.904	INCREASING TREND
MW-16-85	2	1,4-Dioxane	12/20/2016	12/04/2020	1	17	8	µg/L	9	100%	0.67	17	0.049	5.3385	8.000	6.206	INCREASING TREND
MW-17-86	2	1,4-Dioxane	04/25/2017	12/01/2020	11	106	106	µg/L	10	100%	0.45	36	0.000	32.1678	71.100	60.120	INCREASING TREND
MW-19-115	2	1,4-Dioxane	03/04/2020	12/01/2020	8	13	12	µg/L	4	100%	0.23	0	0.625	2.3805	10.500	10.295	NO SIGNIFICANT TREND
MW-19-116	2	1,4-Dioxane	03/04/2020	12/02/2020	54	82	82	µg/L	4	100%	0.19	2	0.375	12.2304	64.250	63.449	NO SIGNIFICANT TREND
MW-19-120	2	1,4-Dioxane	12/04/2019	12/02/2020	28	198	28	µg/L	5	100%	0.48	-6	0.012	67.9139	142.400	118.187	NO SIGNIFICANT TREND
MW-19-121	2	1,4-Dioxane	12/04/2019	12/02/2020	4	119	4	µg/L	5	100%	0.79	-6	0.117	55.7423	70.800	39.163	NO SIGNIFICANT TREND
MW-19-122	2	1,4-Dioxane	12/03/2019	12/03/2020	33	43	34	µg/L	5	100%	0.12	-6	0.117	4.7223	38.600	38.362	NO SIGNIFICANT TREND
MW-19-123	2	1,4-Dioxane	12/03/2019	12/03/2020	39	76	39	µg/L	5	100%	0.28	-6	0.117	16.2573	58.600	56.768	NO SIGNIFICANT TREND
MW-19-124	2	1,4-Dioxane	12/04/2019	12/03/2020	197	420	420	µg/L	4	100%	0.39	4	0.167	103.0966	266.750	254.370	NO SIGNIFICANT TREND
PW-14-01	2	1,4-Dioxane	09/19/2014	12/04/2020	12	530	47	µg/L	20	100%	0.71	-67	0.016	186.2860	263.500	178.150	DECREASING TREND
PW-14-02	2	1,4-Dioxane	09/18/2014	12/03/2020	43	580	97	µg/L	16	100%	0.56	-43	0.029	140.2774	250.190	212.334	DECREASING TREND
PW-14-03	3	1,4-Dioxane	09/18/2014	12/01/2020	43	530	71	µg/L	18	100%	0.64	-52	0.027	168.9465	262.280	196.493	DECREASING TREND
TW-14-02	2	1,4-Dioxane	06/11/2015	12/02/2020	<1	3,500	<1	µg/L	22	95%	0.94	-134	0.000	1,253.6840	1,327.090	472.837	DECREASING TREND
TW-14-06	3	1,4-Dioxane	06/09/2015	12/02/2020	<1	790	<1	µg/L	9	89%	1.15	-36	0.000	351.3222	304.440	61.221	DECREASING TREND
TW-15-11	3	1,4-Dioxane	06/09/2015	12/01/2020	51	250	51	µg/L	8	100%	0.41	-19	0.012	75.2974	185.630	166.360	DECREASING TREND
TW-15-12	2	1,4-Dioxane	06/10/2015	12/02/2020	21	220	34	µg/L	6	100%	0.70	-3	0.360	90.8354	130.670	93.225	NO SIGNIFICANT TREND
Metals																	
MW-02-04(3)	3	Arsenic	07/28/2003	06/08/2020	0.007	0.071	0.071	mg/L	12	100%	0.84	46	0.001	0.0168	0.020	0.018	DECREASING TREND

Notes:
< = less than the posted reporting limit
% = percent
CV = coefficient of variation; low values indicate stable concentrations. Values near or greater than 1 suggest variability and/or a temporal trend.
mg/L = milligrams per liter
n = number of samples included in analysis (sample size)
NA = not applicable due to elevated proportion of non-detect concentrations
ng/L = nanograms per liter
p = Indication of statistical significance of trend direction. Concentration trends considered statistically significant trend at p-values less than 0.1 (90% confidence level).
PFOA = Perfluorooctanoic acid
PFHxS = Perfluorohexanesulfonic acid
PFNA = Perfluorononanoic acid
PFOS = Perfluorooctane sulfonic acid
S = Mann-Kendall test statistic. Sign indicates trend direction: positive values suggest increasing trend, negative values suggest decreasing trend, values near zero indicate stability or variability.
RACER = Revitalizing Auto Communities Environmental Response
µg/L = micrograms per liter

Figures

FORMER APC FACILITY

MW-14-63 MW-12-02 P2-MW-01 P2-MW-03 MW-16-80 MW-20-126 TW-14-03 MW-13-42 TW-15-12 MW-13-43 MW-13-44 P2-SB-20 MW-13-45 MW-15-73 TW-14-04 TW-15-13 TW-14-05 PW-14-02 MW-20-127 MW-19-118S/D MW-14-59 MW-16-85 MW-14-58 MW-19-125 MW-20-128 MW-16-84 MW-14-60 MW-17-87 MW-16-82 MW-19-116 MW-19-117 LMW-14-14D LMW-12-08 MW-17-86 MW-16-83 MW-12-05R LMW-12-02 PMW-02 MW-19-115 LMW-12-03S/D PMW-01 MW-15-72 LMW-12-01 LMW-12-07 MW-14-61 MW-12-09 MW-14-57 LMW-14-13D P2-SB-37 MW-19-120 MW-14-56 LMW-15-17D LMW-14-15D MW-12-06 PMW-03 P2-SB-06 LMW-12-06 LMW-12-04 LMW-12-05 LMW-14-12D MW-14-62 MW-19-124 LMW-15-16D MW-16-81 MW-20-130 MW-20-129 MW-19-122 MW-19-121 MW-16-79 TW-16-01 AS-16-02 MW-14-55 MW-12-18 TW-14-02 MW-16-74 MW-16-78 MW-14-54 AS-16-01 MW-16-76 TW-14-01 PW-14-01 MW-12-01 MW-19-123 MW-16-77 MW-16-75 MW-12-07 MW-12-08 P2-MW-02 MW-13-51 MW-13-52 MW-13-50 MW-13-53 MW-12-17 MW-03(2) MW-02(2) MW-01(2)

MW-12-03 MW-12-10R MW-20-131 MW-20-132 MW-04-06R MW-12-11 MW-04-05 P2-SB-03 MW-03-02 MW-12-12 MW-14-70 MW-03-04 MW-03-05 MW-02-01(6) MW-14-66 P6-SB-18 MW-12-13 P2-MW-04 MW-03-07 MW-02-03(6) MW-14-69 MW-04-01(6) MW-02-02(6) MW-03-06 MW-14-68 SME-MW-02 P6-SB-37 MW-14-67 MW-03-08 MW-04-04R P6-SB-35 MW-13-36R P6-SB-21 P6-SB-07 MW-12-14 MWBP-12-UST5-6 MWBP-13A-UST1-4 MWBP-12-UST1-4 MWBP-11-UST1-4 MWBP-12A-UST1-4 UNK-03 MWBP-10-UST5-6 MWBP-10-UST1-4 P6-MW-01 MWBP-10A-UST1-4 MW-13-35 MW-12-15 MW-12-16

LEGEND

- LNAPL MONITORING WELL
- PERCHED ZONE MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BEDROCK MONITORING WELL

APPROXIMATE PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTE:

APC = ADAMS PLATING CO.

0 250 500

SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF PLANTS 2 AND 6 MONITORING WELL LOCATIONS

ARCADIS

FIGURE 1A

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. Barrett PM: R. Christensen TM: A. Villhauer TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 1A - P2&6 Monitoring Wells.mxd PLOTTED: 3/24/2021 11:43:21 AM BY: MJoye

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. Barrett PM: R. Christensen TM: A. Villhauer TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 1B - P3 Monitoring Wells.mxd PLOTTED: 3/25/2021 10:55:35 AM BY: MJoye

MW-04-04
MW-91-4
MW-13-39B
MW-88-1
MW-19-113
MW-18-97
MW-18-98
MW-19-112
MW-02-04(3)
MW-13-40
MW-02-03(3)
MW-12-04
MW-19-110
MW-04-03
MW-18-99
MW-04-02
MW-18-89
MW-13-38
MW-91-3
P3-SB-07
MW-18-90
MW-13-41
MW-18-103
MW-18-102
MW-02-02(3)
MW-93-1
MW-19-107
MW-06
MW-04
UNK-15
UNK-13
MW-03(3)
MW-18-92
MW-91-2R
LMW-12-09
MW-05
MW-18-93
MW-18-101
MW-13-37
MW-19
MW-23
MW-18-88
MW-19-108
CH-14-RO
UNK-14
UNK-11
MW-02(3)
UNK-09
UNK-10
MW-01(3)
MW-18-105
MW-13-104
MW-22
MW-18-91
MW-19-111
MW-12-19
LMW-12-11
P3-SB-28
LMW-12-10
MW-14-65
MW-18-94
MW-18-95
MW-19-114
MW-06(3)
MW-18-96
MW-18-106
MW-18-100
MW-13-26
MW-15-7I
MW-02-01(3)
MW-12-20
MW-04-01(3)
MW-13-30
MW-91-5
MW-13-24
MW-13-22
MW-13-28
MW-13-27
MW-13-23
MW-12-21
MW-14-64
TW-14-07
TW-14-06
TW-14-08
TW-14-09
TW-15-10
PW-14-03
TW-15-11
MW-13-31
MW-13-32
MW-19-119S/D
MW-13-29
MW-13-25
MW-13-33
MW-13-48
MW-13-49
MW-91-6
MW-13-47
MW-13-34
MW-13-46
MW-12-03

LEGEND

- LNAPL MONITORING WELL
- PERCHED ZONE MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BEDROCK MONITORING WELL

APPROXIMATE PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

0 275 550
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF PLANT 3 MONITORING WELL LOCATIONS

ARCADIS

FIGURE
1B

MW-14-58
6/9/2020: 38

MW-14-59
6/9/2020: 56

MW-14-60
6/9/2020: 107

MW-03-05

MW-02-03(6)
6/3/2020: 15

P2-MW-04
6/10/2020: 31

MW-12-09

MW-14-57

MW-03-06

MW-14-62
6/9/2020: 27

0 400 800
SCALE IN FEET

Legend

MONITORING WELLS

- PERCHED ZONE MONITORING WELL
- WELLS SAMPLED AND 1,4-DIOXANE EXCEEDS DW CRITERIA (7.2 ug/L)
- WELLS SAMPLED AND 1,4-DIOXANE DOES NOT EXCEED DW CRITERIA
- PERCHED 1,4-DIXANE IMPACTS > DW CRITERIA

PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:

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

ANALYTICAL DATA FROM THE FIRST QUARTER THROUGH FOURTH QUARTER 2020 ARE POSTED.

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

ALL ANALYTICAL DATA IS IN ug/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

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

ug/L: MICROGRAMS PER LITER.

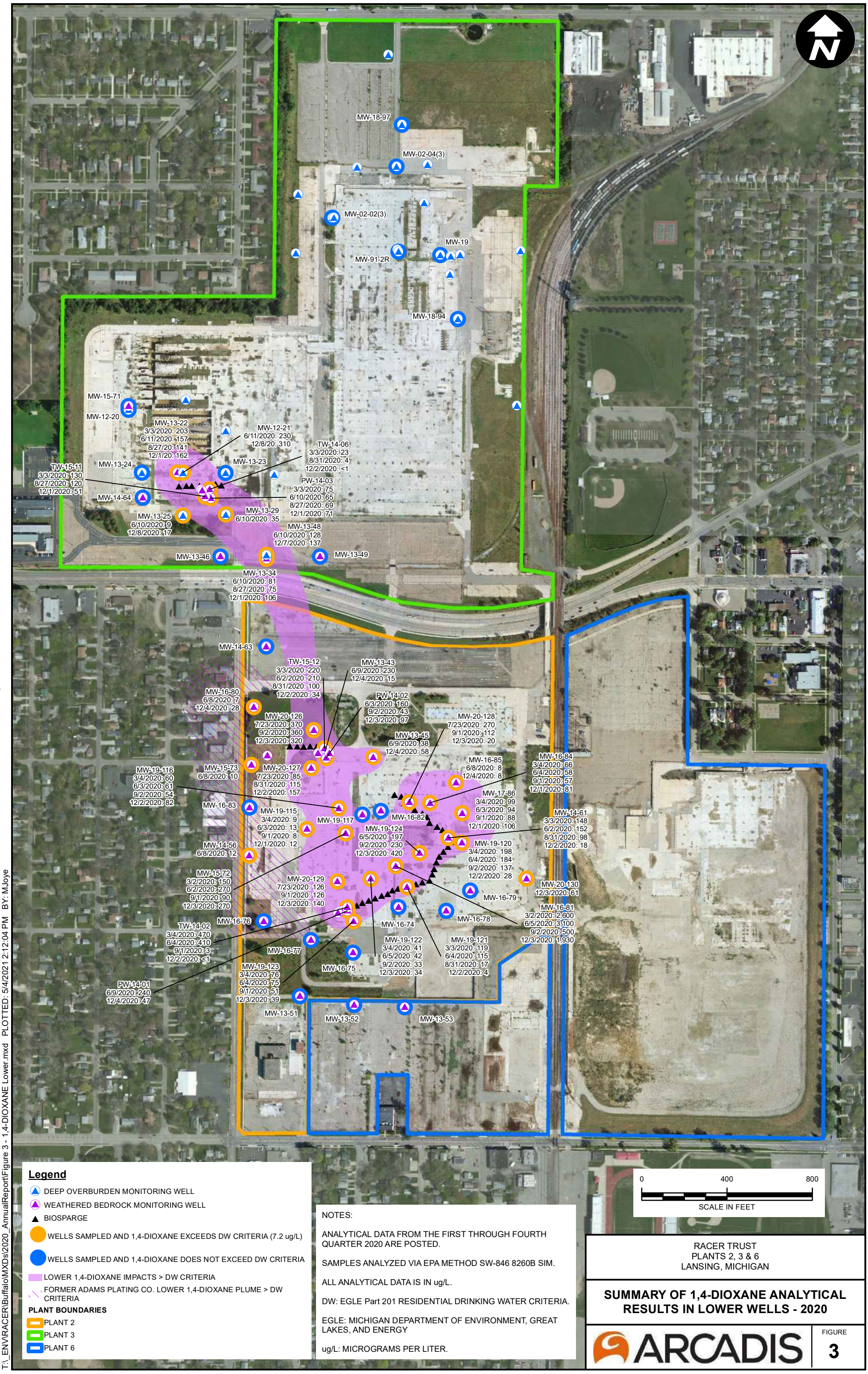
RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF 1,4-DIOXANE ANALYTICAL RESULTS IN PERCHED WELLS - 2020

ARCADIS

FIGURE
2

CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. VILLHAUER TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 2 - 1,4-DIOXANE Perched.mxd PLOTTED: 4/6/2021 9:31:21 AM BY: MJoye



Legend

- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BIOSPARGE
- WELLS SAMPLED AND 1,4-DIOXANE EXCEEDS DW CRITERIA (7.2 ug/L)
- WELLS SAMPLED AND 1,4-DIOXANE DOES NOT EXCEED DW CRITERIA
- LOWER 1,4-DIOXANE IMPACTS > DW CRITERIA
- FORMER ADAMS PLATING CO. LOWER 1,4-DIOXANE PLUME > DW CRITERIA

PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:

ANALYTICAL DATA FROM THE FIRST THROUGH FOURTH QUARTER 2020 ARE POSTED.

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

ALL ANALYTICAL DATA IS IN ug/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

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

ug/L: MICROGRAMS PER LITER.

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF 1,4-DIOXANE ANALYTICAL RESULTS IN LOWER WELLS - 2020

ARCADIS

FIGURE
3

CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. VILLHAUER TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 3 - 1,4-DIOXANE Lower.mxd PLOTTED: 5/4/2021 2:12:04 PM BY: MJoye

MW-13-41
MW-19
MW-05(3)
MW-18-88
UNK-10
UNK-11
MW-13-22
MW-12-21
MW-13-48
MW-13-34
MW-14-59
6/9/2020: 1,1-DCE=19
PW-14-02
MW-16-85
MW-14-60
6/9/2020: VC=5
MW-14-58
MW-17-86
MW-16-84
MW-14-61
MW-15-72
MW-19-120
MW-12-09
MW-16-81
MW-14-62
MW-14-55
TW-14-02
MW-12-18
MW-14-54
6/9/2020: N-Propylbenzene=190
6/9/2020: Benzene=620
6/9/2020: Ethylbenzene=1,710
6/9/2020: Naphthalene=220
6/9/2020: 1,2,4-TMB=650
6/9/2020: Isopropyl Benzene=70
6/9/2020: Total Xylenes=1,360
MW-01(2)
MW-20-132
MW-20-131
12/3/2020: VC=3
MW-03-05
MW-02-03(6)
MW-03-06
6/2/2020: VC=12
MW-03-08
MWBP-11-UST1-4
MWBP-12-UST1-4
MWBP-10-UST5-6

Legend

MONITORING WELLS

- PERCHED ZONE MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BEDROCK MONITORING WELL
- WELLS SAMPLED AND VOC'S EXCEED DW AND/OR GSI
- WELLS SAMPLED AND VOC'S DOES NOT EXCEED DW CRITERIA
- APPROXIMATE EXTENT LNAPL
- EXTENT VOCs IN PERCHED ZONE> DW CRITERIA

PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:

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

ANALYTICAL DATA FROM THE FIRST THROUGH FOURTH QUARTER 2020 ARE POSTED.

HIGHEST EXCEEDANCE FROM 2020 IS SHOWN AT EACH LOCATION.

SAMPLES ANALYZED VIA EPA METHOD SW5030C/8260C.

ALL ANALYTICAL DATA IS IN ug/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.
GSI: EGLE Part 201 GROUNDWATER SURFACE WATER INTERFACE CRITERIA.
EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
ug/L: MICROGRAMS PER LITER.
VC: VINYL CHLORIDE.
1,1-DCE: 1,1-DICHLOROETHENE.
1,2,4-TMB: 1,2,4-TRIMETHYLBENZENE.

0 400 800
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF VOC ANALYTICAL RESULTS - 2020

ARCADIS

FIGURE
4

CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. VILLHAUER TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 4 - VOCs.mxd PLOTTED: 4/6/2021 9:36:10 AM BY: MJoye

MW-02-04(3)
6/8/2020: Arsenic=0.071

MW-91-2R

CH-14-RO
6/8/2020: Chromium III=7.21
6/8/2020: Chromium VI=8

MW-18-88

MW-13-32
6/8/2020: Nickel=0.185

MW-12-13

MW-14-66

MW-14-67

MW-13-36R
6/4/2020: Vanadium=0.005

MWBP-11-UST1-4
6/2/2020: Arsenic=0.012

MWBP-12-UST1-4
6/2/2020: Arsenic=0.010
6/2/2020: Vanadium=0.010

MWBP-10-UST5-6
6/4/2020: Arsenic=0.012

Legend

- PERCHED ZONE MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BEDROCK MONITORING WELL
- WELLS SAMPLED AND METALS EXCEED DW AND/OR GSI CRITERIA
- WELLS SAMPLED AND METALS DOES NOT EXCEED DW CRITERIA

PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:

ALL ANALYTICAL DATA FROM THE FIRST THROUGH FOURTH QUARTER 2020 ARE POSTED.

SAMPLES ANALYZED VIA EPA METHOD 200.8 OR EPA METHOD SM3500-Cr B.

ALL ANALYTICAL DATA IS IN mg/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

GSI: EGLE Part 201 GROUNDWATER SURFACE WATER INTERFACE CRITERIA.

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

mg/L: MILLIGRAMS PER LITER.

0 400 800
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF METALS ANALYTICAL RESULTS - 2020

ARCADIS

FIGURE
5

CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. VILLHAUER TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_Annual\Report\Figure 5 - METALS.mxd PLOTTED: 4/6/2021 9:42:38 AM BY: MJoye

MW-18-98
3/2/2020: 75.2
6/3/2020: 80.0
8/27/2020: 105
12/1/2020: 80.9

MW-19-113

MW-18-97

MW-18-89
3/3/2020: 120
6/8/2020: 150
8/27/2020: 170
12/8/2020: 176

MW-18-90
3/3/2020: 920
6/5/2020: 932
8/27/2020: 1,010
12/7/2020: 1,060

MW-19-112

MW-02-04(3)

MW-18-99
3/2/2020: 46.7
6/2/2020: 62.1
8/27/2020: 81.2
12/2/2020: 130

UNK-15
3/3/2020: 810
6/5/2020: 913
8/27/2020: 1,350
12/8/2020: 1,220

MW-18-93

MW-18-103

MW-18-102

MW-19-107

MW-91-2R

MW-18-88
3/2/2020: 46.1
6/4/2020: 78.2
8/27/2020: 271
12/7/2020: 155

MW-18-92

MW-18-101

MW-23

MW-19-108

CH-14-RO
6/8/2020: 12,900
12/8/2020: 9,390

MW-18-104

MW-18-105
3/3/2020: 12.4
6/4/2020: 8.9
8/28/2020: 8.0
12/7/2020: 10.5

MW-19-111

MW-18-91
3/2/2020: 47.1
6/5/2020: 51.6
8/27/2020: 64.5
12/7/2020: 60.7

MW-18-94

MW-18-96

MW-18-95
3/2/2020: 38.1
6/5/2020: 37.3
8/28/2020: 46.6
12/7/2020: 39.0

MW-19-114

MW-18-106

MW-18-100

MW-04-06R

MW-12-11

MW-12-12
3/3/2020: 40.6
6/3/2020: 45.4
8/31/2020: 67.5
12/2/2020: 66.0

MW-04-05(6)

MW-14-59

MW-14-60
6/9/2020: 13.2
12/4/2020: 5.6

MW-14-58

MW-14-70

MW-12-13

MW-15-72

MW-14-61

MW-03-07

MW-12-09

MW-14-67

MW-14-56

MW-16-81

MW-14-62
6/9/2020: 50.2
12/4/2020: 75.6

MW-04-04R

MW-03-08

MW-20-130

MW-12-18

MW-13-36R
3/4/2020: 44.5
6/4/2020: 46.7
8/31/2020: 52.7
12/2/2020: 53.1

P2-MW-02

P6-SB-07
3/4/2020: 54.9
6/4/2020: 57.2
8/31/2020: 90.4
12/2/2020: 126

Legend

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

PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:

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

ANALYTICAL DATA FROM THE FIRST THROUGH THE FOURTH QUARTER 2020 ARE POSTED.

SAMPLES ANALYZED VIA EPA METHOD 537 MODIFIED.

ALL ANALYTICAL DATA IS IN ng/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.
GSI: EGLE PART 201 GROUNDWATER SURFACE WATER INTERFACE CRITERION.
EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
PFOS: PERFLUOROOCTANE SULFONIC ACID
ng/L: NANOGRAM PER LITER.

0 400 800
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF PFOS ANALYTICAL RESULTS - 2020

ARCADIS

FIGURE
6

CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. VILLHAUER TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 6 - PFOS.mxd PLOTTED: 4/6/2021 9:50:50 AM BY: MJoye

MW-19-113
MW-18-98
3/2/2020: 9.4
6/3/2020: 17.1
8/27/2020: 26.3
12/1/2020: 31.4
MW-18-97
MW-19-112
MW-02-04(3)
MW-18-99
3/2/2020: 3.9
6/2/2020: 6.9
8/27/2020: 8.6
12/2/2020: 9.8
MW-18-90
3/3/2020: 12.6
6/5/2020: 13.3
8/27/2020: 15.9
12/7/2020: 17.8
MW-18-89
3/3/2020: 10.1
6/8/2020: 14.1
8/27/2020: 15.0
12/8/2020: 17.1
UNK-15
3/3/2020: 26.6
6/5/2020: 33.1
8/27/2020: 37.0
12/8/2020: 33.9
MW-19-107
MW-18-92
MW-18-101
MW-91-2R
MW-23
MW-18-93
MW-18-88
3/2/2020: 3.1
6/4/2020: 4.1
8/27/2020: 8.8
12/7/2020: 6.1
MW-18-103
MW-18-102
MW-19-108
CH-14-RO
6/8/2020: 69.2
12/8/2020: 84.7
MW-18-105
MW-18-104
MW-19-111
MW-18-91
3/2/2020: 7.9
6/5/2020: 8.2
8/27/2020: 10.0
12/7/2020: 8.7
MW-18-94
MW-19-114
MW-18-96
MW-18-95
MW-18-106
MW-18-100
MW-04-06R
MW-12-11
MW-12-12
3/3/2020: 69.7
6/3/2020: 60.9
8/31/2020: 117
12/2/2020: 91.2
MW-04-05(6)
6/3/2020: 23.9
MW-14-59
6/9/2020: 6.7
12/4/2020: 8.8
MW-14-58
MW-14-60
6/9/2020: 19.7
12/4/2020: 17.4
MW-14-70
3/4/2020: 37.2
6/3/2020: 42.8
8/31/2020: 6.6
12/2/2020: 7.4
MW-15-72
MW-14-61
MW-03-07
MW-12-13
MW-12-09
6/8/2020: 12.6
12/4/2020: 15.4
MW-14-67
3/4/2020: 11.9
6/4/2020: 10.7
8/31/2020: 11.0
12/2/2020: 27.1
MW-14-56
MW-16-81
MW-14-62
6/9/2020: 36.5
12/4/2020: 47.5
MW-03-08
MW-04-04R
MW-20-130
MW-12-18
MW-13-36R
3/4/2020: 72.1
6/4/2020: 66.9
8/31/2020: 62.8
12/2/2020: 75.2
P2-MW-02
P6-SB-07
3/4/2020: 814
6/4/2020: 1,040
8/31/2020: 1,590
12/2/2020: 1,780

Legend

- PERCHED ZONE MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BEDROCK MONITORING WELL
- WELLS SAMPLED AND PFOA EXCEEDS DW CRITERIA (8 ng/L)
- WELLS SAMPLED AND PFOA DOES NOT EXCEED DW CRITERIA
- PFOA IN PERCHED GROUNDWATER (> 8 ng/L)

PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:

ALL ANALYTICAL DETECTIONS FROM THE FIRST THROUGH FOURTH QUARTER 2020 ARE POSTED.

SAMPLES ANALYZED VIA EPA METHOD 537 MODIFIED.

ALL ANALYTICAL DATA IS IN ng/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

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

PFOA: PERFLUOROOCTANOIC ACID

ng/L: NANOGRAM PER LITER.

0 400 800
SCALE IN FEET

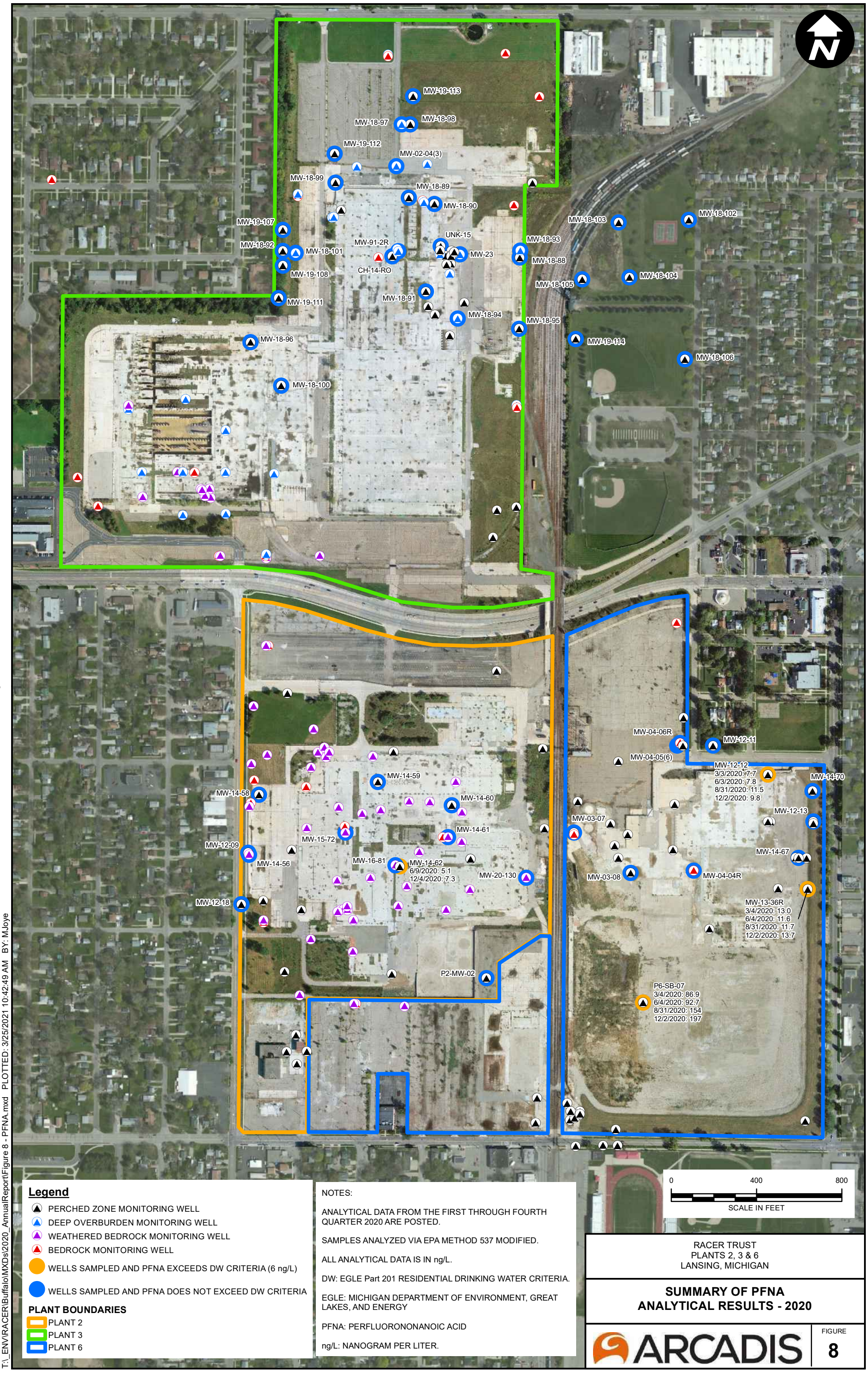
RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF PFOA ANALYTICAL RESULTS - 2020

ARCADIS

FIGURE 7

CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. VILLHAUER TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 7 - PFOA.mxd PLOTTED: 5/4/2021 2:18:36 PM BY: MJoye



Legend

- PERCHED ZONE MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BEDROCK MONITORING WELL
- WELLS SAMPLED AND PFNA EXCEEDS DW CRITERIA (6 ng/L)
- WELLS SAMPLED AND PFNA DOES NOT EXCEED DW CRITERIA

PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:

ANALYTICAL DATA FROM THE FIRST THROUGH FOURTH QUARTER 2020 ARE POSTED.

SAMPLES ANALYZED VIA EPA METHOD 537 MODIFIED.

ALL ANALYTICAL DATA IS IN ng/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA.

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

PFNA: PERFLURONONANOIC ACID

ng/L: NANOGRAM PER LITER.

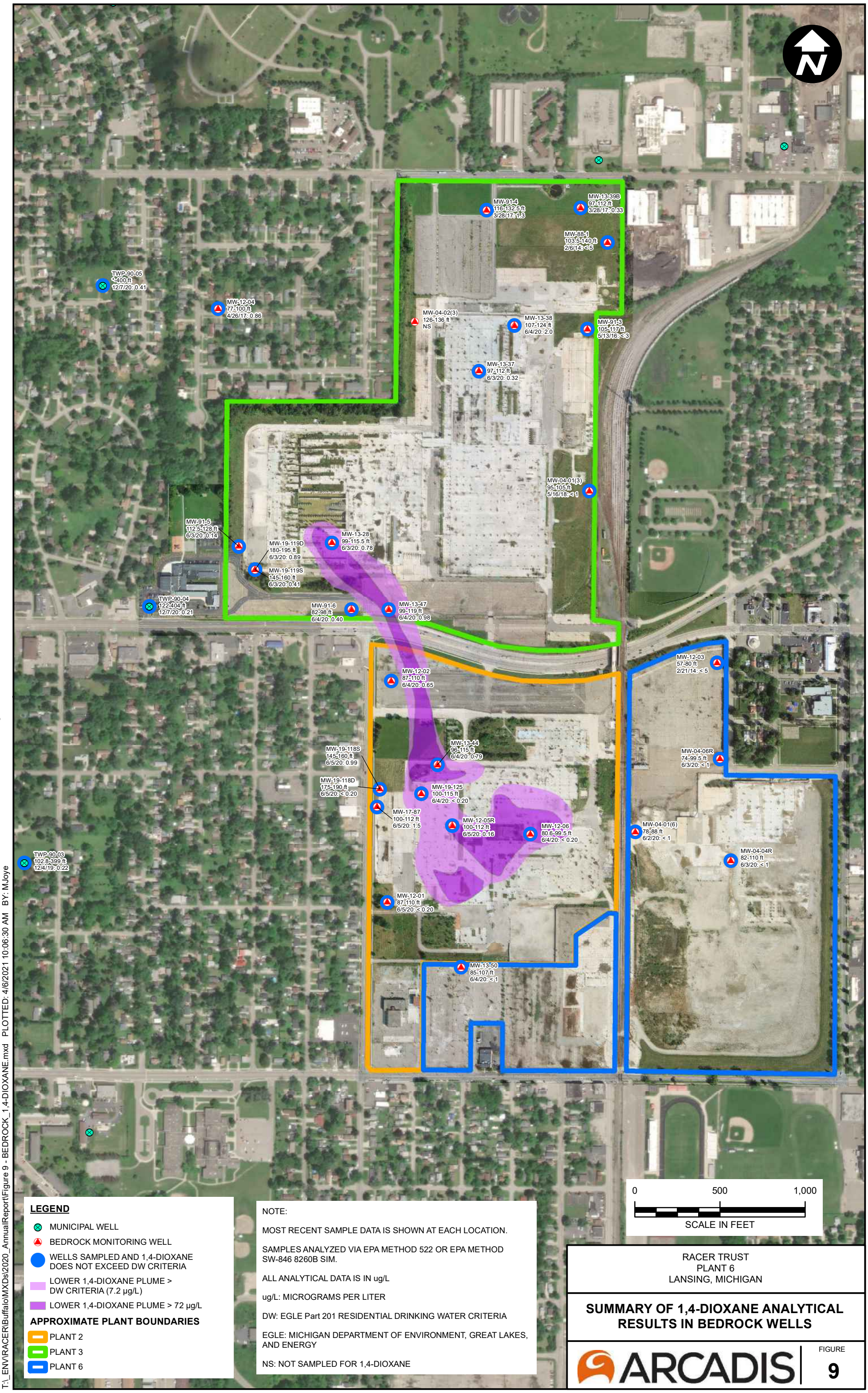
RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF PFNA ANALYTICAL RESULTS - 2020

ARCADIS

FIGURE
8

CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. VILLHAUER TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_Annual\Report\Figure 8 - PFNA.mxd PLOTTED: 3/25/2021 10:42:49 AM BY: MJoye



LEGEND

- MUNICIPAL WELL
- BEDROCK MONITORING WELL
- WELLS SAMPLED AND 1,4-DIOXANE DOES NOT EXCEED DW CRITERIA
- LOWER 1,4-DIOXANE PLUME > DW CRITERIA (7.2 µg/L)
- LOWER 1,4-DIOXANE PLUME > 72 µg/L

APPROXIMATE PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTE:

MOST RECENT SAMPLE DATA IS SHOWN AT EACH LOCATION.

SAMPLES ANALYZED VIA EPA METHOD 522 OR EPA METHOD SW-846 8260B SIM.

ALL ANALYTICAL DATA IS IN ug/L

ug/L: MICROGRAMS PER LITER

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA

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

NS: NOT SAMPLED FOR 1,4-DIOXANE

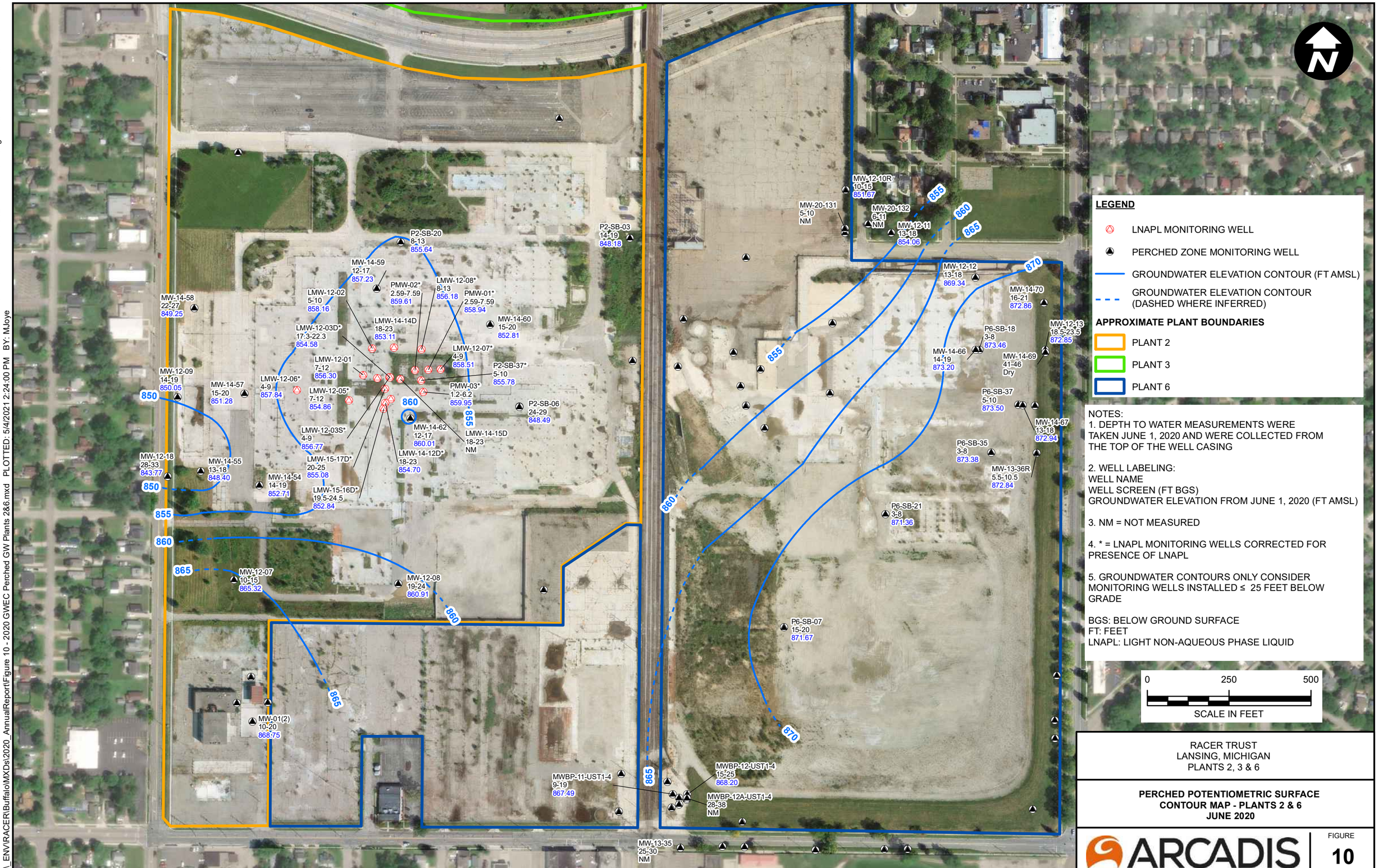
RACER TRUST
PLANT 6
LANSING, MICHIGAN

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

ARCADIS

FIGURE
9

CITY: Novi DIV: ENV DB: TRY PIC: J.Barrett PM: R.Christensen TM: A.Villhauer TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 9 - BEDROCK_1,4-DIOXANE.mxd PLOTTED: 4/6/2021 10:06:30 AM BY: MJoye



LEGEND

- LNAPL MONITORING WELL
- PERCHED ZONE MONITORING WELL
- GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)

APPROXIMATE PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:
1. DEPTH TO WATER MEASUREMENTS WERE TAKEN JUNE 1, 2020 AND WERE COLLECTED FROM THE TOP OF THE WELL CASING

2. WELL LABELING:
WELL NAME
WELL SCREEN (FT BGS)
GROUNDWATER ELEVATION FROM JUNE 1, 2020 (FT AMSL)

3. NM = NOT MEASURED

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

5. GROUNDWATER CONTOURS ONLY CONSIDER MONITORING WELLS INSTALLED ≤ 25 FEET BELOW GRADE

BGS: BELOW GROUND SURFACE
FT: FEET
LNAPL: LIGHT NON-AQUEOUS PHASE LIQUID

0 250 500
SCALE IN FEET

RACER TRUST
LANSING, MICHIGAN
PLANTS 2, 3 & 6

PERCHED POTENTIOMETRIC SURFACE CONTOUR MAP - PLANTS 2 & 6 JUNE 2020

ARCADIS

FIGURE
10

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. Barrett PM: R. Christensen TM: A. Vilhauer TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 10 - 2020 GWEC Perched GW Plants 2&6.mxd PLOTTED: 5/4/2021 2:24:00 PM BY: MJoye

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. Barrett PM: R. Christensen TM: A. Villhauer TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 11 - 2020 GWEC Perched GW Plants 3.mxd PLOTTED: 5/4/2021 3:21:45 PM BY: MJoye

MW-19-113
16-21
837.15

MW-18-98
7-12
856.42

MW-19-112
9-14
855.31

MW-18-99
9-14
858.36

MW-19-110
8-13
Dry

MW-18-89
7-12
860.51

MW-18-90
15-20
857.00

P3-SB-07
11-16
858.76

MW-19-107
23-28
856.18

UNK-13
11-16
NM

UNK-15
11-16
859.00

MW-04(3)
10.5-15.5
NM

MW-05(3)
10-15
NM

LMW-12-09*
3-8
859.91

MW-18-92
23-28
857.80

CH-14-RO
7-12
859.65

UNK-14
10.4-15.4
NM

UNK-11
6.5-11.5
859.26

MW-18-88
6-11
858.87

MW-19-108
23-28
859.58

UNK-10
11-16
859.29

MW-18-91
7-12
860.44

MW-19-111
20-25
855.42

LMW-12-11*
15-20
855.83

MW-12-19
5-10
NM

P3-SB-28
8-13
860.90

LMW-12-10*
14-19
855.33

MW-18-95
4.5-9.5
858.06

MW-14-65
5-10
859.87

MW-06(3)
6.5-11.5
NM

MW-18-96
7-12
851.40

MW-19-114
6-11
859.40

MW-18-100
8-13
854.46

MW-18-106
5-10
863.24

MW-13-31
5-10
854.94

MW-13-32
5-10
854.96

MW-18-103
5-10
857.38

MW-18-102
10-15
855.68

MW-18-104
5-10
857.40

MW-18-105
6-11
857.66

858
859
860
857
856
855

LEGEND

- LNAPL MONITORING WELL
- PERCHED ZONE MONITORING WELL
- GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- MUNICIPAL SANITARY
- SANITARY LINE

APPROXIMATE PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:
1. DEPTH TO WATER MEASUREMENTS WERE TAKEN JUNE 1, 2020 AND WERE COLLECTED FROM THE TOP OF THE WELL CASING

2. WELL LABELING:
WELL NAME
WELL SCREEN (FT BGS)
GROUNDWATER ELEVATION FROM JUNE 1, 2020 (FT AMSL)

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

4. GROUNDWATER CONTOURS ONLY CONSIDER MONITORING WELLS INSTALLED ≤ 28 FEET BELOW GRADE

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

0 240 480
SCALE IN FEET

RACER TRUST
LANSING, MICHIGAN
PLANTS 2, 3 & 6

PERCHED POTENTIOMETRIC SURFACE CONTOUR MAP - PLANT 3 JUNE 2020

ARCADIS

FIGURE
11

MW-04-04(3)
72-82
803.48

MW-18-97
85-90
802.75

MW-02-03(3)
79-89
803.72

MW-02-04(3)
76-86
803.31

MW-13-40
72-77
809.00

MW-04-03(3)
80-90
803.57

MW-13-41
77-82
809.19

MW-02-02(3)
74-84
804.50

MW-93-1
65-75
805.65

MW-18-101
80-85
804.16

MW-91-2R
75-80
809.30

MW-19
55-65
813.29

MW-23
52-62
NM

MW-18-93
77.5-82.5
813.83

MW-22
52.5-62.5
812.37

MW-18-94
72-77
811.49

MW-12-20
75-80
803.64

MW-13-26
72-77
804.49

MW-02-01(3)
59-69
812.73

MW-13-30
72-77
802.69

MW-13-24
69-74
804.25

MW-12-21
70-75
802.87

MW-13-23
69-74
800.21

MW-13-27
67-72
800.37

MW-13-25
67-72
800.14

MW-13-29
68-73
799.93

MW-13-48
65-70
799.54

803 805 807 809 811 813

804 802 800

LEGEND

DEEP OVERBURDEN MONITORING WELL

APPROXIMATE PLANT BOUNDARIES

PLANT 2

PLANT 3

PLANT 6

NOTES:
1. DEPTH TO WATER MEASUREMENTS WERE TAKEN JUNE 1-2, 2020 AND WERE COLLECTED FROM THE TOP OF THE WELL CASING

2. WELL LABELING:
WELL NAME
WELL SCREEN (FT BGS)
GROUNDWATER ELEVATION FROM JUNE 1-2, 2020 (FT AMSL)

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

0 260 520
SCALE IN FEET

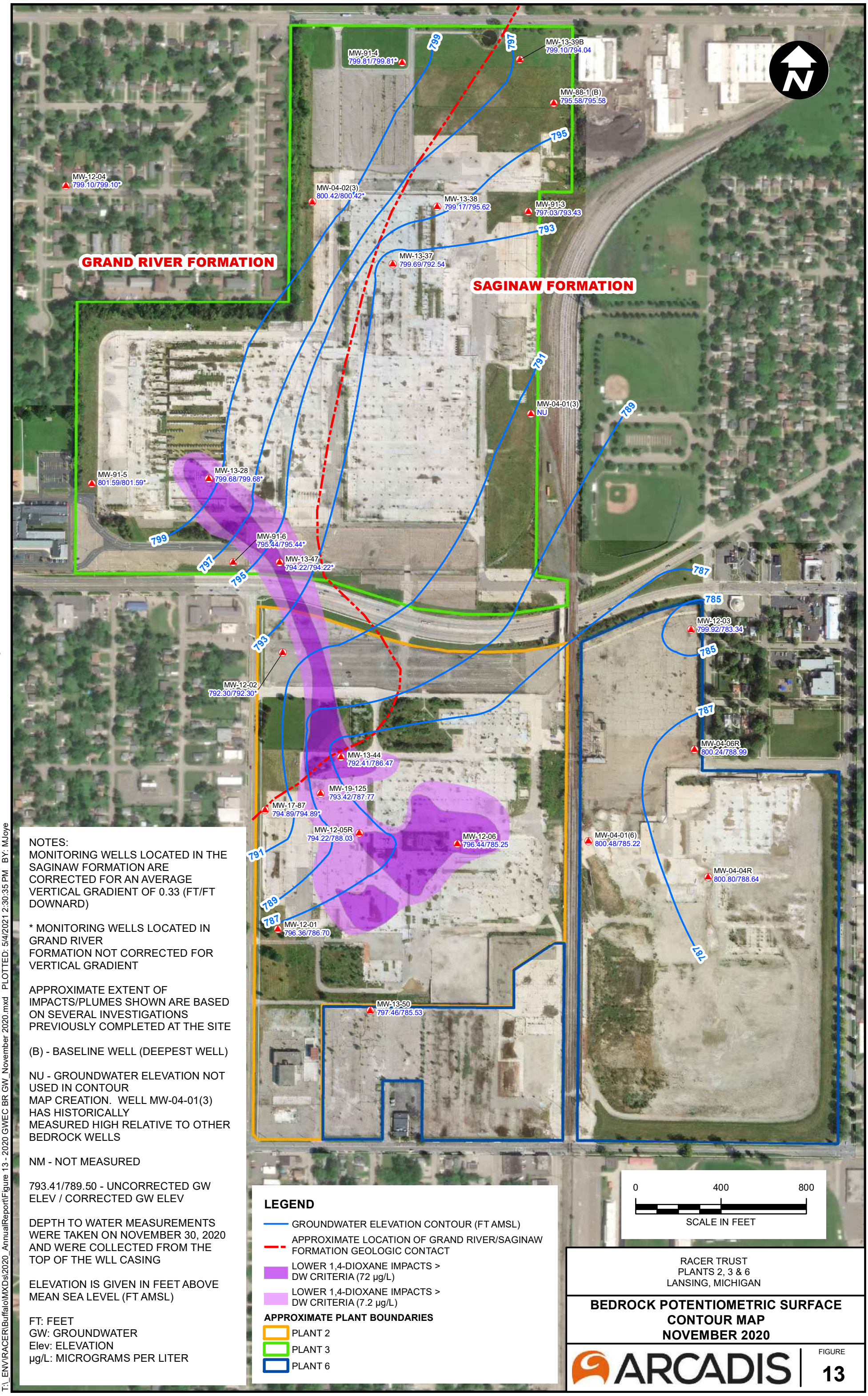
RACER TRUST
LANSING, MICHIGAN
PLANTS 2, 3 & 6

DEEP OVERBURDEN POTENTIOMETRIC SURFACE CONTOUR MAP - PLANT 3 JUNE 2020

ARCADIS

FIGURE
12

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. Barrett PM: R. Christensen TM: A. Villhauer TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 12 - 2020 GWEC Deep OB GW Plant 3.mxd PLOTTED: 5/4/2021 3:03:27 PM BY: MJoye



NOTES:
MONITORING WELLS LOCATED IN THE SAGINAW FORMATION ARE CORRECTED FOR AN AVERAGE VERTICAL GRADIENT OF 0.33 (FT/FT DOWNARD)

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

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

(B) - BASELINE WELL (DEEPEST WELL)

NU - GROUNDWATER ELEVATION NOT USED IN CONTOUR
MAP CREATION. WELL MW-04-01(3) HAS HISTORICALLY
MEASURED HIGH RELATIVE TO OTHER BEDROCK WELLS

NM - NOT MEASURED

793.41/789.50 - UNCORRECTED GW ELEV / CORRECTED GW ELEV

DEPTH TO WATER MEASUREMENTS WERE TAKEN ON NOVEMBER 30, 2020 AND WERE COLLECTED FROM THE TOP OF THE WLL CASING

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

FT: FEET
GW: GROUNDWATER
Elev: ELEVATION
µg/L: MICROGRAMS PER LITER

LEGEND

- GROUNDWATER ELEVATION CONTOUR (FT AMSL)
- APPROXIMATE LOCATION OF GRAND RIVER/SAGINAW FORMATION GEOLOGIC CONTACT
- LOWER 1,4-DIOXANE IMPACTS > DW CRITERIA (72 µg/L)
- LOWER 1,4-DIOXANE IMPACTS > DW CRITERIA (7.2 µg/L)

APPROXIMATE PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

BEDROCK POTENTIOMETRIC SURFACE CONTOUR MAP NOVEMBER 2020

ARCADIS

FIGURE
13

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. Barrett PM: R. Christensen TM: A. Villhauer TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 13 - 2020 GWEC BR GW_November 2020.mxd PLOTTED: 5/4/2021 2:30:35 PM BY: MJoye

AREA 13
MW-19-113
MW-18-98
MW-19-112
AREA 12
MW-18-99
AREA 18
MW-18-89
MW-18-90
MW-19-107
AREA 17
UNK-15
MW-05(3)
UNK-11
UNK-10
MW-18-92
CH-14-RO
MW-19-108
MW-18-88
MW-18-91
MW-19-111
AREA 20
MW-14-65
MW-18-95
AREA 14
MW-06(3)
MW-19-114
MW-18-106
MW-18-100
AREA 16
AREA 21
AREA 11
AREA 15
AREA 19
MW-13-31
MW-13-32
MW-18-103
MW-18-102
MW-18-104
MW-18-105
AREA 8
AREA 3
AREA 5
AREA 5-7
AREA 5-1
AREA 5-4
MW-20-131
MW-20-132
MW-12-11
P2-SB-20
MW-04-05(6)
MW-12-12
AREA 4
MW-14-59
MW-14-60
1,4-D - Decreasing Trend
VC - Increasing Trend
PFOS - No Trend
PFOA - No Trend
MW-14-70
MW-14-58
AREA 5-2
MW-03-04
MW-03-05
AREA 5-8
MW-12-13
MW-12-09
MW-14-57
P2-MW-04
MW-02-03(6)
MW-03-06
MW-14-67
MW-14-62
AREA 5-5
MW-12-18
AREA 5-6
MW-13-36R
Vanadium - No Trend
MW-14-55
AREA 5-3
PFOS - No Trend
MW-14-54
Benzene - No Trend
PFOA - Increasing Trend
Ethylbenzene - Increasing Trend
PFNA - No Trend
AREA 2
Isopropyl Benzene - Increasing Trend
Total Xylenes - Increasing Trend
AREA 10
P6-SB-07
AREA 1
MW-01(2)
AREA 9
MWBP-11-UST1-4
MWBP-12-UST1-4
Arsenic - No Trend
Benzene - Increasing Trend
Vanadium - No Trend
AREA 6
MWBP-10-UST5-6
Arsenic - Increasing Trend
P6-MW-01
AREA 7
MW-13-35
MW-12-16

LEGEND

- INCREASING TREND OBSERVED
- DECREASING, STABLE, OR NO SIGNIFICANT TREND OBSERVED
- DOES NOT MEET CRITERIA FOR TREND ANALYSIS*
- APPROXIMATE EXTENT LNAPL
- EXTENT OF VOCs IN PERCHED ZONE > DW CRITERIA
- PERCHED 1,4-DIOXANE IMPACTS > DW CRITERIA

APPROXIMATE PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:

* MANN-KENDALL TREND ANALYSIS CONDUCTED AT 90% CONFIDENCE LEVEL FOR WELL/COC PAIRS MEETING THE FOLLOWING CRITERIA:
- AT LEAST FOUR SAMPLING EVENTS HAVE BEEN COMPLETED
- AT LEAST 65% OF SAMPLING RESULTS WERE ABOVE DETECTION LIMITS
- AT LEAST ONE DETECTION IN THE DATASET EXCEEDED THE LOWEST CRITERIA
- ALL DATA COLLECTED THROUGH DECEMBER 2020 IS SHOWN.
- ANALYTICAL DATA COMPARED AGAINST EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA AND/OR EGLE Part 201 GROUNDWATER SURFACE WATER INTERFACE CRITERIA DURING TREND ANALYSIS REVIEW.

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

EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
VOCs: VOLATILE ORGANIC COMPOUNDS
1,4-D: 1,4-DIOXANE
VC: VINYL CHLORIDE
PFOS: PERFLUOROOCTANE SULFONIC ACID
PFOA: PERFLUOROOCTANOIC ACID
PFNA: PERFLUORONONANOIC ACID
PFAS: PERFLUOROOCTANOIC ACID
GW: GROUNDWATER
DW: DRINKING WATER
LNAPL: LIGHT NON-AQUEOUS PHASE LIQUID
COC: CONSTITUENT OF CONCERN

0 400 800
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF VOC, 1,4-DIOXANE, PFAS, AND METALS TRENDS IN PERCHED GROUNDWATER - 2020

ARCADIS

FIGURE
14

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. Barrett PM: R. Christensen TM: A. Villhauer TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 14 - 2020 MK Perched Trends.mxd PLOTTED: 4/6/2021 10:23:05 AM BY: MJoye

MW-18-97
MW-02-04(3)
MW-13-40
MW-13-41
MW-02-02(3)
MW-18-101
MW-19
MW-23
MW-18-93
MW-91-2R
MW-22
MW-18-94
MW-15-71
MW-13-22
MW-12-21
MW-13-24
MW-13-23
TW-14-06
TW-15-11
PW-14-03
MW-14-64
MW-13-29
MW-13-25
MW-13-48
MW-13-49
MW-13-46
MW-13-34
MW-14-63
MW-16-80
MW-20-126
TW-15-12
MW-13-43
PW-14-02
MW-13-45
MW-15-73
MW-20-127
MW-16-85
MW-16-83
MW-20-128
MW-16-84
MW-19-116
MW-17-86
MW-16-82
MW-19-115
MW-14-61
MW-14-56
MW-15-72
MW-19-124
MW-19-120
MW-19-122
MW-16-81
MW-20-129
MW-20-130
MW-19-121
AS-16-01
TW-14-02
MW-16-79
MW-16-74
AS-16-02
MW-16-76
MW-16-78
TW-14-01
PW-14-01
TW-16-01
MW-19-123
MW-16-77
MW-16-75
MW-13-51

LEGEND

- INCREASING TREND OBSERVED
- DECREASING, STABLE, OR NO SIGNIFICANT TREND OBSERVED
- DOES NOT MEET CRITERIA FOR TREND ANALYSIS*
- LOWER 1,4-DIOXANE IMPACTS > DW CRITERIA (7.2 µg/L)

APPROXIMATE PLANT BOUNDARIES

- PLANT 2
- PLANT 3
- PLANT 6

NOTES:

MANN-KENDALL TREND ANALYSIS CONDUCTED AT 90% CONFIDENCE LEVEL FOR WELL/COC PAIRS MEETING THE FOLLOWING CRITERIA:
- AT LEAST FOUR SAMPLING EVENTS HAVE BEEN COMPLETED
- AT LEAST 65% OF SAMPLING RESULTS WERE ABOVE DETECTION LIMITS
- AT LEAST ONE DETECTION IN THE DATASET EXCEEDED THE LOWEST CRITERIA

ALL DATA COLLECTED THROUGH DECEMBER 2020 IS SHOWN.

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

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

DW: DRINKING WATER
COC: CONSTITUENT OF CONCERN
1,4-D: 1,4-DIOXANE
EGLE: MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
µg/L: MICROGRAMS PER LITER

0 400 800
SCALE IN FEET

RACER TRUST
PLANTS 2, 3 & 6
LANSING, MICHIGAN

SUMMARY OF 1,4-DIOXANE TRENDS IN DEEP OVERBURDEN AND WEATHERED BEDROCK - 2020

ARCADIS

FIGURE
15

CITY: KNOXVILLE DIV: ENV DB: A.SMITH PIC: J. Barrett PM: R. Christensen TM: A. Villhauer TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2020_AnnualReport\Figure 15 - 2020 MK Deep OB Weathered BR Trends.mxd PLOTTED: 4/23/2021 8:10:31 AM BY: MJoye

Appendix A

Lansing Township Municipal Well Locations and Data

(on attached CD)

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403
Tel: (802)660-1990

Laboratory Job ID: 200-56406-1
Client Project/Site: Racer Lansing

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Tiffany Linder

Authorized for release by:
12/14/2020 3:32:15 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Method Summary 12
Sample Summary 13
Chain of Custody 14
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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Qualifiers

GC/MS Semi VOA

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

Glossary

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

Job ID: 200-56406-1

Laboratory: Eurofins TestAmerica, Burlington

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Racer Lansing

Report Number: 200-56406-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Burlington attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 12/8/2020 10:30 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.4º C.

1,4-DIOXANE

Samples FB-01_120720 (200-56406-1), TWP-90-04_120720 (200-56406-2), TWP-90-05_120720 (200-56406-3) and DUP-08-120720 (200-56406-4) were analyzed for 1,4-Dioxane in accordance with EPA Method 522. The samples were prepared on 12/08/2020 and analyzed on 12/10/2020.

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

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Client Sample ID: FB-01_120720 — Lab Sample ID: 200-56406-1

No Detections.

Client Sample ID: TWP-90-04_120720 — Lab Sample ID: 200-56406-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.21		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: TWP-90-05_120720 — Lab Sample ID: 200-56406-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.41		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: DUP-08-120720 — Lab Sample ID: 200-56406-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.22		0.20	0.073	ug/L	1		522	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FB-01_120720

Lab Sample ID: 200-56406-1

Date Collected: 12/07/20 08:45

Matrix: Water

Date Received: 12/08/20 10:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		12/08/20 19:35	12/10/20 10:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*95*		*46 - 130*	*12/08/20 19:35*	*12/10/20 10:15*	*1*

Client Sample ID: TWP-90-04_120720

Lab Sample ID: 200-56406-2

Date Collected: 12/07/20 08:50

Matrix: Water

Date Received: 12/08/20 10:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.21**		0.20	0.073	ug/L		12/08/20 19:35	12/10/20 10:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*91*		*46 - 130*	*12/08/20 19:35*	*12/10/20 10:29*	*1*

Client Sample ID: TWP-90-05_120720

Lab Sample ID: 200-56406-3

Date Collected: 12/07/20 09:05

Matrix: Water

Date Received: 12/08/20 10:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.41**		0.20	0.073	ug/L		12/08/20 19:35	12/10/20 10:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*96*		*46 - 130*	*12/08/20 19:35*	*12/10/20 10:42*	*1*

Client Sample ID: DUP-08-120720

Lab Sample ID: 200-56406-4

Date Collected: 12/07/20 09:05

Matrix: Water

Date Received: 12/08/20 10:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.22**		0.20	0.073	ug/L		12/08/20 19:35	12/10/20 10:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*97*		*46 - 130*	*12/08/20 19:35*	*12/10/20 10:55*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		DXE
Lab Sample ID	Client Sample ID	(46-130)
200-56406-1	FB-01_120720	95
200-56406-2	TWP-90-04_120720	91
200-56406-3	TWP-90-05_120720	96
200-56406-4	DUP-08-120720	97
LCS 200-161867/2-A	Lab Control Sample	96
LCSD 200-161867/3-A	Lab Control Sample Dup	100
MB 200-161867/1-A	Method Blank	100

Surrogate Legend

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

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

Lab Sample ID: MB 200-161867/1-A
Matrix: Water
Analysis Batch: 161927

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 161867

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		12/08/20 19:35	12/10/20 10:02	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*100*		*46 - 130*	*12/08/20 19:35*	*12/10/20 10:02*	*1*

Lab Sample ID: LCS 200-161867/2-A
Matrix: Water
Analysis Batch: 161927

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 161867

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			8.00	7.85		ug/L		98	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*96*		*46 - 130*

Lab Sample ID: LCSD 200-161867/3-A
Matrix: Water
Analysis Batch: 161927

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 161867

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane			8.00	8.21		ug/L		103	70 - 130	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*100*		*46 - 130*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

GC/MS Semi VOA

Prep Batch: 161867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
200-56406-1	FB-01_120720	Total/NA	Water	522	
200-56406-2	TWP-90-04_120720	Total/NA	Water	522	
200-56406-3	TWP-90-05_120720	Total/NA	Water	522	
200-56406-4	DUP-08-120720	Total/NA	Water	522	
MB 200-161867/1-A	Method Blank	Total/NA	Water	522	
LCS 200-161867/2-A	Lab Control Sample	Total/NA	Water	522	
LCSD 200-161867/3-A	Lab Control Sample Dup	Total/NA	Water	522	

Analysis Batch: 161927

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
200-56406-1	FB-01_120720	Total/NA	Water	522	161867
200-56406-2	TWP-90-04_120720	Total/NA	Water	522	161867
200-56406-3	TWP-90-05_120720	Total/NA	Water	522	161867
200-56406-4	DUP-08-120720	Total/NA	Water	522	161867
MB 200-161867/1-A	Method Blank	Total/NA	Water	522	161867
LCS 200-161867/2-A	Lab Control Sample	Total/NA	Water	522	161867
LCSD 200-161867/3-A	Lab Control Sample Dup	Total/NA	Water	522	161867

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Client Sample ID: FB-01_120720

Lab Sample ID: 200-56406-1
Matrix: Water
Date Collected: 12/07/20 08:45
Date Received: 12/08/20 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			161867	12/08/20 19:35	EK	TAL BUR
Total/NA	Analysis	522		1	161927	12/10/20 10:15	K1P	TAL BUR

Client Sample ID: TWP-90-04_120720

Lab Sample ID: 200-56406-2
Matrix: Water
Date Collected: 12/07/20 08:50
Date Received: 12/08/20 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			161867	12/08/20 19:35	EK	TAL BUR
Total/NA	Analysis	522		1	161927	12/10/20 10:29	K1P	TAL BUR

Client Sample ID: TWP-90-05_120720

Lab Sample ID: 200-56406-3
Matrix: Water
Date Collected: 12/07/20 09:05
Date Received: 12/08/20 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			161867	12/08/20 19:35	EK	TAL BUR
Total/NA	Analysis	522		1	161927	12/10/20 10:42	K1P	TAL BUR

Client Sample ID: DUP-08-120720

Lab Sample ID: 200-56406-4
Matrix: Water
Date Collected: 12/07/20 09:05
Date Received: 12/08/20 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			161867	12/08/20 19:35	EK	TAL BUR
Total/NA	Analysis	522		1	161927	12/10/20 10:55	K1P	TAL BUR

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Laboratory: Eurofins TestAmerica, Burlington

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2336	02-25-23
Connecticut	State	PH-0751	09-30-21
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	05-16-21
Florida	NELAP	E87467	06-30-21
Minnesota	NELAP	050-999-436	12-31-21
New Hampshire	NELAP	2006	12-18-20
New Jersey	NELAP	VT972	06-30-21
New York	NELAP	10391	04-01-21
Pennsylvania	NELAP	68-00489	04-30-21
Rhode Island	State	LAO00298	12-30-20
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-17-00272	10-30-23
Vermont	State	VT4000	12-31-20
Virginia	NELAP	460209	12-14-20
Wisconsin	State	399133350	08-31-21

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
200-56406-1	FB-01_120720	Water	12/07/20 08:45	12/08/20 10:30	
200-56406-2	TWP-90-04_120720	Water	12/07/20 08:50	12/08/20 10:30	
200-56406-3	TWP-90-05_120720	Water	12/07/20 09:05	12/08/20 10:30	
200-56406-4	DUP-08-120720	Water	12/07/20 09:05	12/08/20 10:30	

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler:	Lab PM: DelMonico, Michael	Carrier Tracking No(s):	COC No: 240-77309-30848.1
Client Contact: Alex Villhauer	Phone:	E-Mail: Michael.DelMonico@Eurofinset.com	State of Origin:	Page: Page 1 of 1
Company: ARCADIS U.S., Inc.	PWSID:			Job #:

Address: 300 South Washington Square Suite 315	Due Date Requested:
City: Lansing	TAT Requested (days):
State, Zip: MI, 48933	Compliance Project: Δ Yes Δ No
Phone: 810-225-1928(Tel)	PO #: Purchase Order not required
Email: alex.villhauer@arcadis.com	WO #: Project #: B0064607.2016.00001
Project Name: Racer Lansing method 522	Project #: 24017406
Site:	SSOW#:

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522 - 522-1,4-Dioxane	522 - Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	A		
FB-01_120720	12/7/20	8:45	GRAB	Water	N	N	X	X		
TWP-90-04_120720	12/7/20	8:50	GRAB	Water	N	N	X	X		
TWP-90-05_120720	12/7/20	9:05	GRAB	Water	N	N	X	X		
Dup-08_120720	12/7/20	—	GRAB	Water	N	N	X	X		
				Water						
				Water						

200-56406 COC

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 12/7/20 11:30	Company ARCADIS	Received by: Taylor Whitehouse	Date/Time: 12/8/2020 1030	Company EMAB
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.: 1436564	Cooler Temperature(s) °C and Other Remarks: 3.4

Ver: 11/01/2020

FedEx Express Package US Airbill

FedEx Tracking Number 8148 4562 2658

0200 Recipient's Copy

1 From

Date 12-7-20

Sender's Name KAITLYN VOET Phone 810 305 3642

Company ARCADIS

Address 28550 CABOT DR STE 500 Dept/Floor/Suite/Room

City NOVI State MI ZIP 48377

2 Your Internal Billing Reference 30042872 · 04700

3 To

Recipient's Name SAMPLE RECEIVING Phone [illegible]0.1440

Company TEST AMERICA

Address 30 COMMERCE DRIVE SUITE 11 Dept/Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City SOUTH BURLINGTON State VT ZIP 05403-6809

☐ Hold Weekday — FedEx location address REQUIRED. NOT available for FedEx First Overnight.

☐ Hold Saturday — FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

8148 4562 2658

4 Express Package Service * To most locations. Packages up to 150 lbs. For packages over 150 lbs., use the FedEx Express Freight US Airbill.

Next Business Day

☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless Saturday Delivery is selected.

☐ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless Saturday Delivery is selected.

☒ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

☐ FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.

☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless Saturday Delivery is selected.

☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging * Declared value limit $500.

☐ FedEx Envelope* ☐ FedEx Pak* ☐ FedEx Box ☐ FedEx Tube ☒ Other

6 Special Handling and Delivery Signature Options Fees may apply. See the FedEx Service Guide.

☐ Saturday Delivery — NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

☐ No Signature Required — Package may be left without obtaining a signature for delivery.

☐ Direct Signature — Someone at recipient's address may sign for delivery.

☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only.

Does this shipment contain dangerous goods? One box must be checked.

☒ No ☐ Yes As per attached Shipper's Declaration. ☐ Yes Shipper's Declaration not required. ☐ Dry Ice Dry Ice, 9, UN 1845 ____ x ____ kg

Restrictions apply for dangerous goods — see the current FedEx Service Guide. ☐ Cargo Aircraft Only

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. ☐

☒ Sender Acct. No. in Section 1 will be billed. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

Total Packages Total Weight lbs. Credit Card Auth.

644

*Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

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fedex.com 1.800.GoFedEx 1.800.463.3339

fedex.com 1.800.GoFedEx 1.800.463.3339

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 200-56406-1

Login Number: 56406
List Number: 1
Creator: Jaffe, Nat S

List Source: Eurofins TestAmerica, Burlington

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	1436564
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.4ºC
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix B

Laboratory Analytical Reports

(on attached CD)

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-127078-1
Client Project/Site: Racer Lansing

For:
ARCADIS U.S., Inc.
10559 Citation Drive
Suite 100
Brighton, Michigan 48116

Attn: Amber Dmytro

Authorized for release by:
3/13/2020 10:55:38 AM

Michael DelMonico, Project Manager I
(330)497-9396
michael.delmonico@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Job ID: 240-127078-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Racer Lansing

Report Number: 240-127078-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Canton attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The 522 1,4-Dioxane analysis was performed at the Eurofins TestAmerica, Burlington laboratory.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 3/4/2020 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.7° C.

1,4-DIOXANE

Samples MW-19-119S_030220 (240-127078-1), DUP-04 (240-127078-2), MW-19-119D_030220 (240-127078-3), MW-19-118S_030220 (240-127078-4) and MW-19-118D_030220 (240-127078-5) were analyzed for 1,4-Dioxane in accordance with EPA Method 522. The samples were prepared on 03/06/2020 and analyzed on 03/09/2020.

1,4-Dioxane failed the recovery criteria low for the MSD of sample MW-19-118D_030220MSD (240-127078-5) in batch 200-153031. Refer to the QC report for details.

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

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-127078-1	MW-19-119S_030220	Water	03/02/20 14:05	03/04/20 09:30	
240-127078-2	DUP-04	Water	03/02/20 00:00	03/04/20 09:30	
240-127078-3	MW-19-119D_030220	Water	03/02/20 15:40	03/04/20 09:30	
240-127078-4	MW-19-118S_030220	Water	03/03/20 10:05	03/04/20 09:30	
240-127078-5	MW-19-118D_030220	Water	03/03/20 11:30	03/04/20 09:30	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

Client Sample ID: MW-19-119S_030220 — Lab Sample ID: 240-127078-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.34		0.20	0.064	ug/L	1		522	Total/NA

Client Sample ID: DUP-04 — Lab Sample ID: 240-127078-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.38		0.20	0.064	ug/L	1		522	Total/NA

Client Sample ID: MW-19-119D_030220 — Lab Sample ID: 240-127078-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.57		0.20	0.064	ug/L	1		522	Total/NA

Client Sample ID: MW-19-118S_030220 — Lab Sample ID: 240-127078-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	3.9		0.20	0.064	ug/L	1		522	Total/NA

Client Sample ID: MW-19-118D_030220 — Lab Sample ID: 240-127078-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

Client Sample ID: MW-19-119S_030220
Date Collected: 03/02/20 14:05
Date Received: 03/04/20 09:30

Lab Sample ID: 240-127078-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.34		0.20	0.064	ug/L		03/06/20 13:00	03/09/20 15:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*71*		*46 - 130*	*03/06/20 13:00*	*03/09/20 15:00*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

Client Sample ID: DUP-04
Date Collected: 03/02/20 00:00
Date Received: 03/04/20 09:30

Lab Sample ID: 240-127078-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.38		0.20	0.064	ug/L		03/06/20 13:00	03/09/20 15:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*77*		*46 - 130*	*03/06/20 13:00*	*03/09/20 15:14*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

Client Sample ID: MW-19-119D_030220
Date Collected: 03/02/20 15:40
Date Received: 03/04/20 09:30

Lab Sample ID: 240-127078-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.57		0.20	0.064	ug/L		03/06/20 13:00	03/09/20 15:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*73*		*46 - 130*	*03/06/20 13:00*	*03/09/20 15:28*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

Client Sample ID: MW-19-118S_030220
Date Collected: 03/03/20 10:05
Date Received: 03/04/20 09:30

Lab Sample ID: 240-127078-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	3.9		0.20	0.064	ug/L		03/06/20 13:00	03/09/20 15:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*66*		*46 - 130*	*03/06/20 13:00*	*03/09/20 15:41*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

Client Sample ID: MW-19-118D_030220
Date Collected: 03/03/20 11:30
Date Received: 03/04/20 09:30

Lab Sample ID: 240-127078-5
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U F1	0.20	0.064	ug/L		03/06/20 13:00	03/09/20 15:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*84*		*46 - 130*	*03/06/20 13:00*	*03/09/20 15:55*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DXE (46-130)
240-127078-1	MW-19-119S_030220	71
240-127078-2	DUP-04	77
240-127078-3	MW-19-119D_030220	73
240-127078-4	MW-19-118S_030220	66
240-127078-5	MW-19-118D_030220	84
240-127078-5 MS	MW-19-118D_030220	74
240-127078-5 MSD	MW-19-118D_030220	60
LCS 200-153002/2-A	Lab Control Sample	71
MB 200-153002/1-A	Method Blank	71

Surrogate Legend

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

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

Lab Sample ID: MB 200-153002/1-A
Matrix: Water
Analysis Batch: 153031

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 153002

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.064	ug/L		03/06/20 13:00	03/09/20 14:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*71*		*46 - 130*	*03/06/20 13:00*	*03/09/20 14:47*	*1*

Lab Sample ID: LCS 200-153002/2-A
Matrix: Water
Analysis Batch: 153031

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 153002

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	8.00	5.80		ug/L		73	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*71*		*46 - 130*

Lab Sample ID: 240-127078-5 MS
Matrix: Water
Analysis Batch: 153031

Client Sample ID: MW-19-118D_030220
Prep Type: Total/NA
Prep Batch: 153002

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	0.20	U F1	2.00	1.51		ug/L		76	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*74*		*46 - 130*

Lab Sample ID: 240-127078-5 MSD
Matrix: Water
Analysis Batch: 153031

Client Sample ID: MW-19-118D_030220
Prep Type: Total/NA
Prep Batch: 153002

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	0.20	U F1	2.00	0.20	U F1	ug/L		0	70 - 130	NC	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*60*		*46 - 130*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

GC/MS Semi VOA

Prep Batch: 153002

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-127078-1	MW-19-119S_030220	Total/NA	Water	522	
240-127078-2	DUP-04	Total/NA	Water	522	
240-127078-3	MW-19-119D_030220	Total/NA	Water	522	
240-127078-4	MW-19-118S_030220	Total/NA	Water	522	
240-127078-5	MW-19-118D_030220	Total/NA	Water	522	
MB 200-153002/1-A	Method Blank	Total/NA	Water	522	
LCS 200-153002/2-A	Lab Control Sample	Total/NA	Water	522	
240-127078-5 MS	MW-19-118D_030220	Total/NA	Water	522	
240-127078-5 MSD	MW-19-118D_030220	Total/NA	Water	522	

Analysis Batch: 153031

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-127078-1	MW-19-119S_030220	Total/NA	Water	522	153002
240-127078-2	DUP-04	Total/NA	Water	522	153002
240-127078-3	MW-19-119D_030220	Total/NA	Water	522	153002
240-127078-4	MW-19-118S_030220	Total/NA	Water	522	153002
240-127078-5	MW-19-118D_030220	Total/NA	Water	522	153002
MB 200-153002/1-A	Method Blank	Total/NA	Water	522	153002
LCS 200-153002/2-A	Lab Control Sample	Total/NA	Water	522	153002
240-127078-5 MS	MW-19-118D_030220	Total/NA	Water	522	153002
240-127078-5 MSD	MW-19-118D_030220	Total/NA	Water	522	153002

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

Client Sample ID: MW-19-119S_030220
Lab Sample ID: 240-127078-1
Date Collected: 03/02/20 14:05
Matrix: Water
Date Received: 03/04/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			153002	03/06/20 13:00	EK	TAL BUR
Total/NA	Analysis	522		1	153031	03/09/20 15:00	K1P	TAL BUR

Client Sample ID: DUP-04
Lab Sample ID: 240-127078-2
Date Collected: 03/02/20 00:00
Matrix: Water
Date Received: 03/04/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			153002	03/06/20 13:00	EK	TAL BUR
Total/NA	Analysis	522		1	153031	03/09/20 15:14	K1P	TAL BUR

Client Sample ID: MW-19-119D_030220
Lab Sample ID: 240-127078-3
Date Collected: 03/02/20 15:40
Matrix: Water
Date Received: 03/04/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			153002	03/06/20 13:00	EK	TAL BUR
Total/NA	Analysis	522		1	153031	03/09/20 15:28	K1P	TAL BUR

Client Sample ID: MW-19-118S_030220
Lab Sample ID: 240-127078-4
Date Collected: 03/03/20 10:05
Matrix: Water
Date Received: 03/04/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			153002	03/06/20 13:00	EK	TAL BUR
Total/NA	Analysis	522		1	153031	03/09/20 15:41	K1P	TAL BUR

Client Sample ID: MW-19-118D_030220
Lab Sample ID: 240-127078-5
Date Collected: 03/03/20 11:30
Matrix: Water
Date Received: 03/04/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			153002	03/06/20 13:00	EK	TAL BUR
Total/NA	Analysis	522		1	153031	03/09/20 15:55	K1P	TAL BUR

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-127078-1

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-19 *
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-20 *
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-20
Kentucky (WW)	State	KY98016	12-31-20
Minnesota	NELAP	OH00048	12-31-20
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-16-00404	12-28-19 *
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-21
West Virginia DEP	State	210	12-31-20

Laboratory: Eurofins TestAmerica, Burlington

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2336	02-25-23
Connecticut	State	PH-0751	09-30-21
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	05-15-20
Florida	NELAP	E87467	06-30-20
Minnesota	NELAP	050-999-436	12-31-20
New Hampshire	NELAP	2006	12-18-20
New Jersey	NELAP	VT972	06-30-20
New York	NELAP	10391	03-31-20
Pennsylvania	NELAP	68-00489	04-30-20
Rhode Island	State	LAO00298	12-30-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00272	08-09-20
Vermont	State	VT4000	12-31-20
Virginia	NELAP	460209	12-14-20

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

4.0/4.7

Chain of Custody Record

420485 eurofins | Environment Testi TestAmerica

Address: _____

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other: TAL-821

Client Contact	Project Manager: Mike Spaci	Site Contact: Mike Spaci	Date:	COC No:
Company Name: Arcadis of Michigan, LLC	Tel/Email: Michael.Spaci@arcadis.com	Lab Contact: Michael DelMonico	Carrier:	___ of ___ COCs
Address: 28550 Cabot Drive, Suite 500	**Analysis Turnaround Time**			Sampler:
City/State/Zip: Novi, MI 48377	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
Phone: 313-407-8332 (Mike Spaci)	TAT if different from Below Standard			Walk-in Client:
Fax: 248-994-2241	☐ 2 weeks			Lab Sampling:
Project Name: RACER Lansing	☐ 1 week			
Site: RACER Lansing	☐ 2 days			Job / SDG No.:
PO# 30042872.84700	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	1,4-Dioxane (522)	Sample Specific Notes:
MW-19-1195_030220	3.2.20	1405	G	W	1	N	N	X	
Dup-04	3.2.20	PM	G	W	1	N	N	X	
MW-19-119D_030220	3.2.20	1540	G	W	1	N	N	X	
MW-19-1185_030320	3.3.20	1005	G	W	1	N	N	X	
MW-19-118D_030320	3.3.20	1130	G	W	3	N	Y	X	MS/MSD

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

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

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

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

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

Special Instructions/QC Requirements & Comments:

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

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Jake Pisarkiewicz	PM Environmental	3/3/20 1500	Austin Westhuis	Arcadis	3/3/20 1500
Austin Westhuis	Arcadis	3/3/20 1700	FedEx	FedEx	3/3/20 1700
			Received in Laboratory by:	Company:	Date/Time:
				EMC	3-4-20 930

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 127078

Client Arcadis of Michigan Site Name _____

Cooler unpacked by: MM

Cooler Received on 3-4-20 Opened on 3-4-20

FedEx: 1st Grd ~~Exp~~ UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

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

TestAmerica Cooler # 74 Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam ~~Plastic Bag~~ None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-10 (CF **+0.7** °C) Observed Cooler Temp. 4.0 °C Corrected Cooler Temp. 4.7 °C
   IR GUN #IR-11 (CF **+0.9**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 ~~Yes~~ No
   -Were the seals on the outside of the cooler(s) signed & dated? ~~Yes~~ No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes ~~No~~
   -Were tamper/custody seals intact and uncompromised? ~~Yes~~ No NA
3. Shippers' packing slip attached to the cooler(s)? ~~Yes~~ No
4. Did custody papers accompany the sample(s)? ~~Yes~~ No
5. Were the custody papers relinquished & signed in the appropriate place? Yes ~~No~~
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes ~~No~~
7. Did all bottles arrive in good condition (Unbroken)? ~~Yes~~ No
8. Could all bottle labels be reconciled with the COC? ~~Yes~~ No
9. Were correct bottle(s) used for the test(s) indicated? ~~Yes~~ No
10. Sufficient quantity received to perform indicated analyses? ~~Yes~~ No
11. Are these work share samples? Yes ~~No~~
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No ~~NA~~ pH Strip Lot# **HC995364**
13. Were VOAs on the COC? Yes ~~No~~
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No ~~NA~~
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes ~~No~~
16. Was a LL Hg or Me Hg trip blank present? _____ Yes ~~No~~

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

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: MS

18. SAMPLE CONDITION

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

19. SAMPLE PRESERVATION

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

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservative Added (mls)	Lot #
MW-19-119S_030220	240-127078-A-1	Amber Glass 250mL - hydrochloric acid	<2			
DUP-04	240-127078-A-2	Amber Glass 250mL - hydrochloric acid	<2			
MW-19-119D_030220	240-127078-A-3	Amber Glass 250mL - hydrochloric acid	<2			
MW-19-118S_030220	240-127078-A-4	Amber Glass 250mL - hydrochloric acid	<2			
MW-19-118D_030220	240-127078-A-5	Amber Glass 250mL - hydrochloric acid	<2			
MW-19-118D_030220	240-127078-B-5	Amber Glass 250mL - hydrochloric acid	<2			
MW-19-118D_030220	240-127078-C-5	Amber Glass 250mL - hydrochloric acid	<2			

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

240-127078 Chain of Custody

urofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: DelMonico, Michael	No: -118090.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: michael.delmonico@testamericainc.com	State of Origin: Michigan
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):	Page: Page 1 of 1
Address: 30 Community Drive, Suite 11,	Due Date Requested: 3/17/2020		Job #: 240-127078-1
City: South Burlington	TAT Requested (days):		
State, Zip: VT, 05403			
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:		
Email:	WO #:		
Project Name: Racer Lansing	Project #: 24017406		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522/522_CWA_Prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-19-119S_030220 (240-127078-1)	3/2/20	14:05 Eastern		Water			X	1	
DUP-04 (240-127078-2)	3/2/20	Eastern		Water			X	1	
MW-19-119D_030220 (240-127078-3)	3/2/20	15:40 Eastern		Water			X	1	
MW-19-118S_030220 (240-127078-4)	3/3/20	10:05 Eastern		Water			X	1	
MW-19-118D_030220 (240-127078-5)	3/3/20	11:30 Eastern		Water			X	1	
MW-19-118D_030220 (240-127078-5MS)	3/3/20	11:30 Eastern	MS	Water			X	1	
MW-19-118D_030220 (240-127078-5MSD)	3/3/20	11:30 Eastern	MSD	Water			X	1	

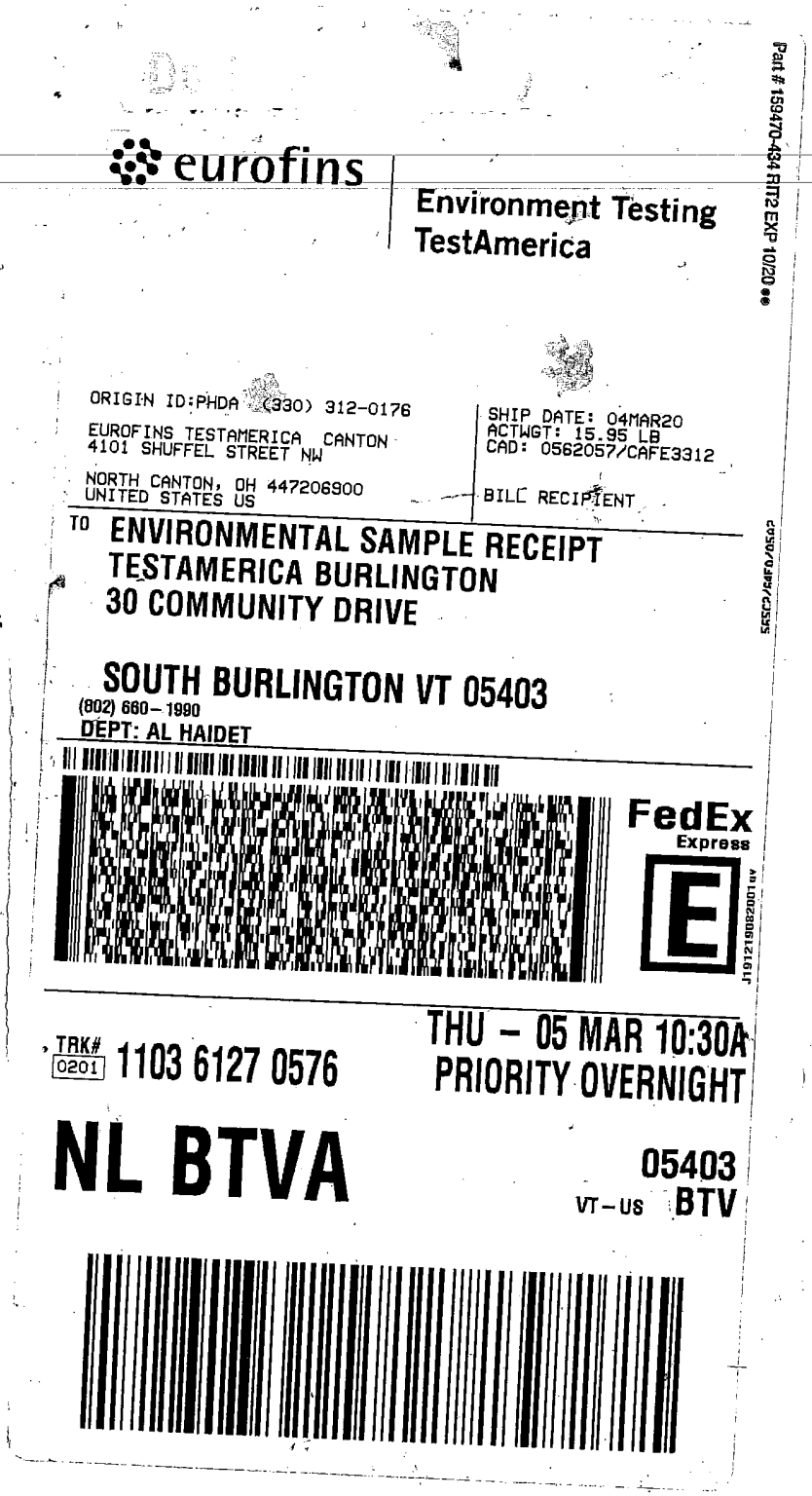
Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation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

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

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 3-4-20 1645	Company 240	Received by: Date/Time: 3/5/2020 10:20 Company TAB
Relinquished by:	Date/Time:	Company	Received by: Date/Time: Company
Relinquished by:	Date/Time:	Company	Received by: Date/Time: Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 0-5

Ver: 01/16/2019


eurofins
Environment Testing
TestAmerica
Part # 159470-434 RIT2 EXP 10/20
ORIGIN ID:PHDA (330) 312-0176
EUROFINS TESTAMERICA, CANTON
4101 SHUFFEL STREET NW
NORTH CANTON, OH 447206900
UNITED STATES US
SHIP DATE: 04MAR20
ACTWGT: 15.95 LB
CAD: 0562057/CAFE3312
BILL RECIPIENT
TO ENVIRONMENTAL SAMPLE RECEIPT
TESTAMERICA BURLINGTON
30 COMMUNITY DRIVE
SOUTH BURLINGTON VT 05403
(802) 660-1990
DEPT: AL HAIDET
FedEx
Express
TRK# 0201 1103 6127 0576
THU - 05 MAR 10:30A
PRIORITY OVERNIGHT
NL BTVA
05403
VT-US BTV

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 240-127078-1

Login Number: 127078
List Number: 2
Creator: Khudaier, Zahraa

List Source: Eurofins TestAmerica, Burlington
List Creation: 03/05/20 12:51 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.5ºC
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Quality Control Report

Report ID: QC-S12004-01
Generated on 02/24/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX: 248-994-2241

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S12004.01-S12004.05
Project: 30042872.01020 / RACER Lansing
Submitted Date/Time: 02/18/2020 15:55
Sampled by: Austin Westhuis
P.O. #: 30042872.01020

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-6)
Prep Batch Summary (Page 7)
Surrogates per Lab Sample (Pages 8-12)
Surrogates per QC Sample (Pages 13-14)
Batch QC Results (Pages 15-24)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S12004.01

Sample Tag: VAP-A5.7-MB257_02172020

Collected Date/Time: 02/17/2020 15:00

Matrix: Groundwater

COC Reference: 133434

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/19/20 16:12	200219A3	VF200219W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12004.02
Sample Tag: MW-13-36R_02172020
Collected Date/Time: 02/17/2020 16:10
Matrix: Groundwater
COC Reference: 133434

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	02/22/20 00:14	P200221	SF200220W01	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12004.03
Sample Tag: MW-13-35_02182020
Collected Date/Time: 02/18/2020 15:30
Matrix: Groundwater
COC Reference: 133434

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	02/22/20 00:44	P200221	SF200220W01	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12004.04
Sample Tag: Dup-01_02172020
Collected Date/Time: 02/17/2020 00:01
Matrix: Groundwater
COC Reference: 133434

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	02/22/20 01:13	P200221	SF200220W01	Yes	BLK/LCS/LCSD

Lab Sample ID: S12004.05

Sample Tag: Trip Blank

Collected Date/Time: 02/17/2020 00:01

Matrix: Water

COC Reference: 133434

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/19/20 15:33	200219A3	VF200219W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Semi-Volatiles, Prep Batch ID: SF200220W01

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S12004.02	Semi-Volatile Organics - MDEQ	SW8270D	02/22/20 00:14	P200221
S12004.03	Semi-Volatile Organics - MDEQ	SW8270D	02/22/20 00:44	P200221
S12004.04	Semi-Volatile Organics - MDEQ	SW8270D	02/22/20 01:13	P200221

Organics - Volatiles, Prep Batch ID: VF200219W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S12004.01	Volatile Organics - DEQ List	SW5030C/8260C	02/19/20 16:12	200219A3
S12004.05	Volatile Organics - DEQ List	SW5030C/8260C	02/19/20 15:33	200219A3

QC Report - Surrogates per Lab Sample

Lab Sample ID: S12004.01

Sample Tag: VAP-A5.7-MB257_02172020

Collected Date/Time: 02/17/2020 15:00

Matrix: Groundwater

COC Reference: 133434

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200219A3, Run Date: 02/19/2020 16:12, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**106.2**	80.0	124.0
1,2-Dichloroethane-D4		**99.4**	72.0	125.0
Toluene-D8		**100.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S12004.02

Sample Tag: MW-13-36R_02172020

Collected Date/Time: 02/17/2020 16:10

Matrix: Groundwater

COC Reference: 133434

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200221, Run Date: 02/22/2020 00:14, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**50.0**	10.0	110.0
Phenol-D5		**38.2**	10.0	110.0
Nitrobenzene-D5		**75.6**	10.0	114.0
2-Fluorobiphenyl		**82.7**	10.0	116.0
2,4,6-Tribromophenol		**81.0**	10.0	123.0
Terphenyl-D14		**96.8**	10.0	141.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S12004.03

Sample Tag: MW-13-35_02182020

Collected Date/Time: 02/18/2020 15:30

Matrix: Groundwater

COC Reference: 133434

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200221, Run Date: 02/22/2020 00:44, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**41.5**	10.0	110.0
Phenol-D5		**34.7**	10.0	110.0
Nitrobenzene-D5		**67.0**	10.0	114.0
2-Fluorobiphenyl		**72.8**	10.0	116.0
2,4,6-Tribromophenol		**63.3**	10.0	123.0
Terphenyl-D14		**90.1**	10.0	141.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S12004.04

Sample Tag: Dup-01_02172020

Collected Date/Time: 02/17/2020 00:01

Matrix: Groundwater

COC Reference: 133434

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200221, Run Date: 02/22/2020 01:13, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**50.2**	10.0	110.0
Phenol-D5		**38.9**	10.0	110.0
Nitrobenzene-D5		**74.7**	10.0	114.0
2-Fluorobiphenyl		**77.2**	10.0	116.0
2,4,6-Tribromophenol		**74.4**	10.0	123.0
Terphenyl-D14		**91.6**	10.0	141.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S12004.05

Sample Tag: Trip Blank

Collected Date/Time: 02/17/2020 00:01

Matrix: Water

COC Reference: 133434

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200219A3, Run Date: 02/19/2020 15:33, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**110.2**	80.0	124.0
1,2-Dichloroethane-D4		**89.4**	72.0	125.0
Toluene-D8		**97.0**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Semi-Volatiles, Prep Batch ID: SF200220W01

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: P200221.BLKW20A

Run in Batch: P200221, Run Date: 02/21/2020 22:13, Prep Date: 02/20/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**49.6**	10.0	110.0
Phenol-D5		**37.3**	10.0	110.0
Nitrobenzene-D5		**73.8**	10.0	114.0
2-Fluorobiphenyl		**69.4**	10.0	116.0
2,4,6-Tribromophenol		**66.8**	10.0	123.0
Terphenyl-D14		**86.9**	10.0	141.0

Laboratory Control Sample (LCS)

Lab Sample ID: P200221.LCSW20A

Run in Batch: P200221, Run Date: 02/21/2020 22:43, Prep Date: 02/20/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**48.1**	10.0	110.0
Phenol-D5		**37.1**	10.0	110.0
Nitrobenzene-D5		**72.0**	10.0	114.0
2-Fluorobiphenyl		**75.9**	10.0	116.0
2,4,6-Tribromophenol		**74.4**	10.0	123.0
Terphenyl-D14		**86.6**	10.0	141.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200221.LCSDW20A, Parent Sample ID: P200221.LCSW20A

Run in Batch: P200221, Run Date: 02/21/2020 23:14, Prep Date: 02/20/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**48.1**	10.0	110.0
Phenol-D5		**36.2**	10.0	110.0
Nitrobenzene-D5		**72.1**	10.0	114.0
2-Fluorobiphenyl		**78.1**	10.0	116.0
2,4,6-Tribromophenol		**72.6**	10.0	123.0
Terphenyl-D14		**85.1**	10.0	141.0

Organics - Volatiles, Prep Batch ID: VF200219W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200219A3.BLKW19A

Run in Batch: 200219A3, Run Date: 02/19/2020 15:00, Prep Date: 02/19/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**105.8**	80.0	124.0
1,2-Dichloroethane-D4		**91.6**	72.0	125.0
Toluene-D8		**96.8**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200219A3.LCSW19A

Run in Batch: 200219A3, Run Date: 02/19/2020 13:42, Prep Date: 02/19/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**120.8**	80.0	124.0
1,2-Dichloroethane-D4		**87.4**	72.0	125.0
Toluene-D8		**100.4**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200219A3.LCSDW19A, Parent Sample ID: 200219A3.LCSW19A

Run in Batch: 200219A3, Run Date: 02/19/2020 14:02, Prep Date: 02/19/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**120.6**	80.0	124.0
1,2-Dichloroethane-D4		**84.8**	72.0	125.0
Toluene-D8		**102.8**	89.0	112.0

Organics - Semi-Volatiles, Prep Batch ID: SF200220W01

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

Blank (BLK)

Lab Sample ID: P200221.BLKW20A

Run in Batch: P200221, Run Date: 02/21/2020 22:13, Prep Date: 02/20/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acenaphthene		ND	0.00050	mg/l
Acenaphthylene		ND	0.00050	mg/l
Anthracene		ND	0.00050	mg/l
Benzo(a)anthracene		ND	0.00050	mg/l
Benzo(b)fluoranthene		ND	0.00050	mg/l
Benzo(k)fluoranthene		ND	0.00050	mg/l
Benzo(ghi)perylene		ND	0.00050	mg/l
Benzo(a)pyrene		ND	0.00050	mg/l
bis(2-Chloroethoxy)methane		ND	0.00050	mg/l
bis(2-Chloroethyl)ether		ND	0.00050	mg/l
bis(2-Chloroisopropyl)ether		ND	0.00050	mg/l
bis(2-Ethylhexyl)phthalate		ND	0.00050	mg/l
4-Bromophenyl phenyl ether		ND	0.00050	mg/l
Butyl benzyl phthalate		ND	0.00050	mg/l
4-Chloroaniline		ND	0.00050	mg/l
2-Chloronaphthalene		ND	0.00050	mg/l
4-Chloro-3-methylphenol		ND	0.00050	mg/l
2-Chlorophenol		ND	0.00050	mg/l
4-Chlorophenyl phenyl ether		ND	0.00050	mg/l
Chrysene		ND	0.00050	mg/l
3-, 4-Methylphenol (p,m-Cresol)		ND	0.00100	mg/l
2-Methylphenol (o-Cresol)		ND	0.00050	mg/l
Dibenzo(ah)anthracene		ND	0.00050	mg/l
Dibenzofuran		ND	0.00050	mg/l
di-n-Butyl phthalate		ND	0.00050	mg/l
1,2-Dichlorobenzene		ND	0.00050	mg/l
1,3-Dichlorobenzene		ND	0.00050	mg/l
1,4-Dichlorobenzene		ND	0.00050	mg/l
3,3'-Dichlorobenzidine		ND	0.00050	mg/l
2,4-Dichlorophenol		ND	0.00050	mg/l
Diethyl phthalate		ND	0.00050	mg/l
2,4-Dimethylphenol		ND	0.00050	mg/l
Dimethyl phthalate		ND	0.00050	mg/l
4,6-Dinitro-2-methylphenol		ND	0.00050	mg/l
2,4-Dinitrophenol		ND	0.00050	mg/l
2,4-Dinitrotoluene		ND	0.00050	mg/l
2,6-Dinitrotoluene		ND	0.00050	mg/l
1,2-Diphenylhydrazine		ND	0.00050	mg/l
di-n-Octyl phthalate		ND	0.00050	mg/l
Fluoranthene		ND	0.00050	mg/l
Fluorene		ND	0.00050	mg/l
Hexachlorobenzene		ND	0.00050	mg/l
Hexachlorobutadiene		ND	0.00050	mg/l
Hexachlorocyclopentadiene		ND	0.00050	mg/l
Hexachloroethane		ND	0.00050	mg/l
Indeno(1,2,3-cd)pyrene		ND	0.00050	mg/l

Organics - Semi-Volatiles, Prep Batch ID: SF200220W01 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: P200221.BLKW20A

Run in Batch: P200221, Run Date: 02/21/2020 22:13, Prep Date: 02/20/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Isophorone		ND	0.00050	mg/l
2-Methylnaphthalene		ND	0.00050	mg/l
Naphthalene		ND	0.00050	mg/l
2-Nitroaniline		ND	0.00050	mg/l
3-Nitroaniline		ND	0.00050	mg/l
4-Nitroaniline		ND	0.00050	mg/l
Nitrobenzene		ND	0.00050	mg/l
2-Nitrophenol		ND	0.00050	mg/l
4-Nitrophenol		ND	0.00050	mg/l
N-Nitrosodiphenylamine		ND	0.00050	mg/l
N-Nitrosodi-n-propylamine		ND	0.00050	mg/l
Pentachlorophenol		ND	0.00050	mg/l
Phenanthrene		ND	0.00050	mg/l
Phenol		ND	0.00050	mg/l
Pyrene		ND	0.00050	mg/l
1,2,4-Trichlorobenzene		ND	0.00050	mg/l
2,4,5-Trichlorophenol		ND	0.00050	mg/l
2,4,6-Trichlorophenol		ND	0.00050	mg/l

Laboratory Control Sample (LCS)

Lab Sample ID: P200221.LCSW20A

Run in Batch: P200221, Run Date: 02/21/2020 22:43, Prep Date: 02/20/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		66.6	37.82	102.82
Acenaphthylene		68.2	34.75	114.76
Anthracene		78.4	38.29	107.17
Benzo(a)anthracene		80.9	39.45	103.23
Benzo(b)fluoranthene		79.0	39.3	105.62
Benzo(k)fluoranthene		81.3	37.32	99.27
Benzo(ghi)perylene		86.0	25.65	121.02
Benzo(a)pyrene		82.0	41	102.98
bis(2-Chloroethoxy)methane		67.0	38.96	94.94
bis(2-Chloroethyl)ether		61.0	32.79	92.32
bis(2-Chloroisopropyl)ether		55.9	28.96	95.55
bis(2-Ethylhexyl)phthalate		79.6	43.38	102.89
4-Bromophenyl phenyl ether		76.2	36.32	111.95
Butyl benzyl phthalate		76.0	41.29	98.17
4-Chloroaniline		52.2	11.53	72.6
2-Chloronaphthalene		58.9	36.7	102.59
4-Chloro-3-methylphenol		67.1	39.63	104.28
2-Chlorophenol		63.7	34.18	94.55
4-Chlorophenyl phenyl ether		70.6	38.63	115.88
Chrysene		80.2	42.42	104.5
3-, 4-Methylphenol (p,m-Cresol)		54.3	36.4	115.4
2-Methylphenol (o-Cresol)		60.2	37.3	120.0
Dibenzo(ah)anthracene		85.2	31.37	119.17

Organics - Semi-Volatiles, Prep Batch ID: SF200220W01 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: P200221.LCSW20A

Run in Batch: P200221, Run Date: 02/21/2020 22:43, Prep Date: 02/20/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Dibenzofuran		68.8	40.25	104.89
di-n-Butyl phthalate		80.8	42.66	109.16
1,2-Dichlorobenzene		39.4	35.29	149.51
1,3-Dichlorobenzene		36.2	32.15	155.22
1,4-Dichlorobenzene		36.9	33.22	151.25
3,3'-Dichlorobenzidine		56.3	26.1	103.71
2,4-Dichlorophenol		65.7	41.58	98.03
Diethyl phthalate		77.0	43.35	109.88
2,4-Dimethylphenol		69.7	39.69	104.6
Dimethyl phthalate		76.8	44.99	102.98
4,6-Dinitro-2-methylphenol		72.1	19.98	101.32
2,4-Dinitrophenol		61.7	10	109.59
2,4-Dinitrotoluene		71.5	37.33	115.88
2,6-Dinitrotoluene		70.8	41.24	106.63
1,2-Diphenylhydrazine		76.3	39.95	95.79
di-n-Octyl phthalate		79.4	38.19	107.3
Fluoranthene		80.6	39.79	106.64
Fluorene		73.0	36.94	108.4
Hexachlorobenzene		76.6	34.37	118.98
Hexachlorobutadiene		33.4	16.99	122.89
Hexachlorocyclopentadiene		36.3	21.56	132.1
Hexachloroethane		31.0	22.96	157.68
Indeno(1,2,3-cd)pyrene		86.1	29.55	116.59
Isophorone		69.4	33.67	101.86
2-Methylnaphthalene		52.8	29.6	140.3
Naphthalene		52.2	31.37	140.54
2-Nitroaniline		72.3	41.37	98.69
3-Nitroaniline		56.1	22.05	86.36
4-Nitroaniline		66.6	31.15	107.83
Nitrobenzene		63.4	38.21	124.16
2-Nitrophenol		61.6	38.56	92.8
4-Nitrophenol		51.1	13.39	116.72
N-Nitrosodiphenylamine		78.4	33.26	108.23
N-Nitrosodi-n-propylamine		64.2	32.25	95.51
Pentachlorophenol		70.1	17.09	112.61
Phenanthrene		77.2	37.67	105.05
Phenol		36.0	10	103.25
Pyrene		81.3	38.69	102.69
1,2,4-Trichlorobenzene		43.1	39.12	156.7
2,4,5-Trichlorophenol		70.6	38.05	112.24
2,4,6-Trichlorophenol		69.3	38.38	108.99

Organics - Semi-Volatiles, Prep Batch ID: SF200220W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200221.LCSDW20A, Parent Sample ID: P200221.LCSW20A

Run in Batch: P200221, Run Date: 02/21/2020 23:14, Prep Date: 02/20/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		67.3	37.82	102.82	1.0	30.0
Acenaphthylene		67.5	34.75	114.76	1.0	30.0
Anthracene		77.3	38.29	107.17	1.4	30.0
Benzo(a)anthracene		78.1	39.45	103.23	3.5	30.0
Benzo(b)fluoranthene		78.0	39.3	105.62	1.4	30.0
Benzo(k)fluoranthene		80.8	37.32	99.27	0.6	30.0
Benzo(ghi)perylene		85.7	25.65	121.02	0.4	30.0
Benzo(a)pyrene		81.0	41	102.98	1.2	30.0
bis(2-Chloroethoxy)methane		66.5	38.96	94.94	0.7	30.0
bis(2-Chloroethyl)ether		59.9	32.79	92.32	1.9	30.0
bis(2-Chloroisopropyl)ether		55.2	28.96	95.55	1.3	30.0
bis(2-Ethylhexyl)phthalate		77.1	43.38	102.89	3.1	30.0
4-Bromophenyl phenyl ether		76.6	36.32	111.95	0.5	30.0
Butyl benzyl phthalate		74.5	41.29	98.17	2.0	30.0
4-Chloroaniline		51.8	11.53	72.6	0.8	30.0
2-Chloronaphthalene		59.8	36.7	102.59	1.5	30.0
4-Chloro-3-methylphenol		66.6	39.63	104.28	0.8	30.0
2-Chlorophenol		63.5	34.18	94.55	0.3	30.0
4-Chlorophenyl phenyl ether		71.4	38.63	115.88	1.1	30.0
Chrysene		79.1	42.42	104.5	1.4	30.0
3-, 4-Methylphenol (p,m-Cresol)		54.0	36.4	115.4	0.6	30.0
2-Methylphenol (o-Cresol)		59.8	37.3	120.0	0.6	30.0
Dibenzo(ah)anthracene		83.8	31.37	119.17	1.6	30.0
Dibenzofuran		69.3	40.25	104.89	0.8	30.0
di-n-Butyl phthalate		81.3	42.66	109.16	0.6	30.0
1,2-Dichlorobenzene		39.3	35.29	149.51	0.3	30.0
1,3-Dichlorobenzene		36.0	32.15	155.22	0.4	30.0
1,4-Dichlorobenzene		36.4	33.22	151.25	1.2	30.0
3,3'-Dichlorobenzidine		56.8	26.1	103.71	0.9	30.0
2,4-Dichlorophenol		65.5	41.58	98.03	0.4	30.0
Diethyl phthalate		77.5	43.35	109.88	0.6	30.0
2,4-Dimethylphenol		70.3	39.69	104.6	0.8	30.0
Dimethyl phthalate		76.3	44.99	102.98	0.7	30.0
4,6-Dinitro-2-methylphenol		72.9	19.98	101.32	1.2	30.0
2,4-Dinitrophenol		62.7	10	109.59	1.5	30.0
2,4-Dinitrotoluene		71.9	37.33	115.88	0.6	30.0
2,6-Dinitrotoluene		70.6	41.24	106.63	0.3	30.0
1,2-Diphenylhydrazine		75.8	39.95	95.79	0.6	30.0
di-n-Octyl phthalate		77.3	38.19	107.3	2.7	30.0
Fluoranthene		78.3	39.79	106.64	2.9	30.0
Fluorene		72.6	36.94	108.4	0.5	30.0
Hexachlorobenzene		72.7	34.37	118.98	5.3	30.0
Hexachlorobutadiene		34.1	16.99	122.89	2.0	30.0
Hexachlorocyclopentadiene		36.5	21.56	132.1	0.5	30.0
Hexachloroethane		31.0	22.96	157.68	0.1	30.0
Indeno(1,2,3-cd)pyrene		85.8	29.55	116.59	0.4	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF200220W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: P200221.LCSDW20A, Parent Sample ID: P200221.LCSW20A

Run in Batch: P200221, Run Date: 02/21/2020 23:14, Prep Date: 02/20/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isophorone		68.6	33.67	101.86	1.1	30.0
2-Methylnaphthalene		52.4	29.6	140.3	0.6	30.0
Naphthalene		51.8	31.37	140.54	0.8	30.0
2-Nitroaniline		73.7	41.37	98.69	1.9	30.0
3-Nitroaniline		55.7	22.05	86.36	0.7	30.0
4-Nitroaniline		67.4	31.15	107.83	1.3	30.0
Nitrobenzene		63.5	38.21	124.16	0.1	30.0
2-Nitrophenol		62.9	38.56	92.8	2.1	30.0
4-Nitrophenol		52.0	13.39	116.72	1.7	30.0
N-Nitrosodiphenylamine		79.1	33.26	108.23	0.9	30.0
N-Nitrosodi-n-propylamine		63.3	32.25	95.51	1.5	30.0
Pentachlorophenol		69.6	17.09	112.61	0.7	30.0
Phenanthrene		75.1	37.67	105.05	2.8	30.0
Phenol		35.8	10	103.25	0.7	30.0
Pyrene		81.1	38.69	102.69	0.3	30.0
1,2,4-Trichlorobenzene		42.4	39.12	156.7	1.5	30.0
2,4,5-Trichlorophenol		72.6	38.05	112.24	2.8	30.0
2,4,6-Trichlorophenol		72.0	38.38	108.99	3.8	30.0

Organics - Volatiles, Prep Batch ID: VF200219W1

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

Blank (BLK)

Lab Sample ID: 200219A3.BLKW19A

Run in Batch: 200219A3, Run Date: 02/19/2020 15:00, Prep Date: 02/19/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200219W1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200219A3.BLKW19A

Run in Batch: 200219A3, Run Date: 02/19/2020 15:00, Prep Date: 02/19/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200219A3.LCSW19A

Run in Batch: 200219A3, Run Date: 02/19/2020 13:42, Prep Date: 02/19/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		105.3	67.4	121.2
Acetone		92.2	29.9	161.5
Methyl iodide	*	119.3	68.8	116.4
Carbon disulfide		104.8	63.8	137.4
tert-Methyl butyl ether (MTBE)		101.0	73.2	122.4
Acrylonitrile		104.1	69.9	128.9
2-Butanone (MEK)		92.8	44.0	134.4
Dichlorodifluoromethane		59.0	10.0	222.8
Chloromethane		77.4	23.8	166.5
Vinyl chloride		88.1	43.5	149.1
Bromomethane		88.7	56.8	151.3
Chloroethane		92.9	53.4	149.4
Trichlorofluoromethane		98.8	59.7	151.8
1,1-Dichloroethene		104.4	69.6	139.4
Methylene chloride		100.4	73.3	121.1
trans-1,2-Dichloroethene		99.4	73.6	129.3
1,1-Dichloroethane		97.5	71.5	126.2
cis-1,2-Dichloroethene		101.2	76.6	122.1
Tetrahydrofuran		99.9	59.0	117.9
Chloroform		100.0	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200219W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200219A3.LCSW19A

Run in Batch: 200219A3, Run Date: 02/19/2020 13:42, Prep Date: 02/19/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		105.0	78.2	120.8
1,1,1-Trichloroethane		100.8	79.4	130.9
4-Methyl-2-pentanone (MIBK)		108.8	71.6	125.2
2-Hexanone		106.7	55.4	136.9
Carbon tetrachloride		125.7	72.6	133.0
Benzene		108.3	79.9	124.9
1,2-Dichloroethane		102.0	76.0	126.3
Trichloroethene		110.6	79.7	124.2
1,2-Dichloropropane		110.9	78.6	126.4
Bromodichloromethane		111.2	80.4	128.2
Dibromomethane	*	126.1	76.9	122.1
cis-1,3-Dichloropropene		114.9	79.8	129.9
Toluene		107.6	79.8	124.5
trans-1,3-Dichloropropene		113.4	74.0	131.3
1,1,2-Trichloroethane		112.2	78.7	123.1
Tetrachloroethene		118.2	74.5	124.5
trans-1,4-Dichloro-2-butene		133.5	68.6	135.4
Dibromochloromethane	*	129.8	74.6	127.2
1,2-Dibromoethane		113.3	70.3	133.7
Chlorobenzene		116.7	79.2	122.7
1,1,1,2-Tetrachloroethane		124.9	80.3	128.2
Ethylbenzene		112.8	79.5	129.1
p,m-Xylene		112.9	79.4	132.2
o-Xylene		109.9	80.2	131.0
Styrene		117.8	69.5	126.7
Isopropylbenzene		114.2	74.4	121.5
Bromoform	*	149.2	69.4	128.0
1,1,2,2-Tetrachloroethane		115.5	79.8	126.3
1,2,3-Trichloropropane		116.2	78.3	138.8
n-Propylbenzene		114.2	82.0	130.7
Bromobenzene		120.9	78.7	124.6
1,3,5-Trimethylbenzene		119.2	81.3	128.9
tert-Butylbenzene		110.5	80.7	128.9
1,2,4-Trimethylbenzene		116.7	81.4	130.8
sec-Butylbenzene		99.6	77.4	129.8
p-Isopropyltoluene		101.1	79.8	137.5
1,3-Dichlorobenzene		103.2	77.0	131.3
1,4-Dichlorobenzene		105.3	20.7	137.7
1,2-Dichlorobenzene		104.6	10.0	166.2
1,2,3-Trimethylbenzene		97.8	76.3	124.2
n-Butylbenzene		95.6	80.0	133.3
Hexachloroethane		137.7	23.8	138.1
1,2-Dibromo-3-chloropropane		114.4	21.2	189.4
1,2,4-Trichlorobenzene		112.1	27.4	143.4
1,2,3-Trichlorobenzene		110.5	75.4	131.4
Naphthalene		99.5	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200219W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200219A3.LCSW19A

Run in Batch: 200219A3, Run Date: 02/19/2020 13:42, Prep Date: 02/19/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		90.5	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200219A3.LCSDW19A, Parent Sample ID: 200219A3.LCSW19A

Run in Batch: 200219A3, Run Date: 02/19/2020 14:02, Prep Date: 02/19/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		110.9	67.4	121.2	5.2	30.0
Acetone		99.4	29.9	161.5	7.6	30.0
Methyl iodide	*	128.7	68.8	116.4	7.6	30.0
Carbon disulfide		111.4	63.8	137.4	6.1	30.0
tert-Methyl butyl ether (MTBE)		109.1	73.2	122.4	7.8	30.0
Acrylonitrile		110.8	69.9	128.9	6.2	30.0
2-Butanone (MEK)		102.2	44.0	134.4	9.6	30.0
Dichlorodifluoromethane		62.2	10.0	222.8	5.3	30.0
Chloromethane		78.5	23.8	166.5	1.4	30.0
Vinyl chloride		92.2	43.5	149.1	4.5	30.0
Bromomethane		91.6	56.8	151.3	3.2	30.0
Chloroethane		96.5	53.4	149.4	3.8	30.0
Trichlorofluoromethane		102.4	59.7	151.8	3.6	30.0
1,1-Dichloroethene		111.0	69.6	139.4	6.2	30.0
Methylene chloride		108.8	73.3	121.1	8.1	30.0
trans-1,2-Dichloroethene		106.4	73.6	129.3	6.7	30.0
1,1-Dichloroethane		104.4	71.5	126.2	6.9	30.0
cis-1,2-Dichloroethene		107.6	76.6	122.1	6.1	30.0
Tetrahydrofuran		108.4	59.0	117.9	8.1	30.0
Chloroform		108.7	78.4	124.0	8.3	30.0
Bromochloromethane		113.4	78.2	120.8	7.7	30.0
1,1,1-Trichloroethane		107.3	79.4	130.9	6.2	30.0
4-Methyl-2-pentanone (MIBK)		121.8	71.6	125.2	11.2	30.0
2-Hexanone		118.4	55.4	136.9	10.4	30.0
Carbon tetrachloride	*	133.9	72.6	133.0	6.3	30.0
Benzene		118.1	79.9	124.9	8.7	30.0
1,2-Dichloroethane		111.8	76.0	126.3	9.1	30.0
Trichloroethene		119.3	79.7	124.2	7.5	30.0
1,2-Dichloropropane		119.9	78.6	126.4	7.8	30.0
Bromodichloromethane		121.4	80.4	128.2	8.7	30.0
Dibromomethane	*	136.7	76.9	122.1	8.1	30.0
cis-1,3-Dichloropropene		125.1	79.8	129.9	8.5	30.0
Toluene		117.2	79.8	124.5	8.5	30.0
trans-1,3-Dichloropropene		124.1	74.0	131.3	9.1	30.0
1,1,2-Trichloroethane		122.5	78.7	123.1	8.8	30.0
Tetrachloroethene	*	130.5	74.5	124.5	9.9	30.0
trans-1,4-Dichloro-2-butene	*	138.4	68.6	135.4	3.6	30.0
Dibromochloromethane	*	140.2	74.6	127.2	7.7	30.0
1,2-Dibromoethane		122.1	70.3	133.7	7.5	30.0
Chlorobenzene	*	123.8	79.2	122.7	5.9	30.0

Organics - Volatiles, Prep Batch ID: VF200219W1 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200219A3.LCSDW19A, Parent Sample ID: 200219A3.LCSW19A

Run in Batch: 200219A3, Run Date: 02/19/2020 14:02, Prep Date: 02/19/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane	*	134.8	80.3	128.2	7.6	30.0
Ethylbenzene		120.6	79.5	129.1	6.7	30.0
p,m-Xylene		119.6	79.4	132.2	5.8	30.0
o-Xylene		116.2	80.2	131.0	5.6	30.0
Styrene		125.6	69.5	126.7	6.4	30.0
Isopropylbenzene	*	121.6	74.4	121.5	6.3	30.0
Bromoform	*	157.4	69.4	128.0	5.3	30.0
1,1,2,2-Tetrachloroethane		122.5	79.8	126.3	5.9	30.0
1,2,3-Trichloropropane		121.3	78.3	138.8	4.3	30.0
n-Propylbenzene		121.0	82.0	130.7	5.9	30.0
Bromobenzene	*	129.5	78.7	124.6	6.9	30.0
1,3,5-Trimethylbenzene		126.8	81.3	128.9	6.2	30.0
tert-Butylbenzene		116.7	80.7	128.9	5.5	30.0
1,2,4-Trimethylbenzene		124.8	81.4	130.8	6.7	30.0
sec-Butylbenzene		107.7	77.4	129.8	7.8	30.0
p-Isopropyltoluene		109.3	79.8	137.5	7.8	30.0
1,3-Dichlorobenzene		113.6	77.0	131.3	9.6	30.0
1,4-Dichlorobenzene		114.1	20.7	137.7	8.0	30.0
1,2-Dichlorobenzene		113.3	10.0	166.2	8.0	30.0
1,2,3-Trimethylbenzene		106.9	76.3	124.2	8.9	30.0
n-Butylbenzene		104.3	80.0	133.3	8.7	30.0
Hexachloroethane	*	153.6	23.8	138.1	11.0	30.0
1,2-Dibromo-3-chloropropane		121.6	21.2	189.4	6.2	30.0
1,2,4-Trichlorobenzene		121.9	27.4	143.4	8.4	30.0
1,2,3-Trichlorobenzene		119.5	75.4	131.4	7.8	30.0
Naphthalene		108.4	32.9	135.8	8.5	30.0
2-Methylnaphthalene		98.0	25.5	165.5	7.9	30.0

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

133434

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 810-225-1928 | FAX NO.: 248-994-2241 | P.O. NO.: 30042872.01020
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 30042872.01020 / PACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____
DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MF

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs - 8260	SVOCs - 8270
12004.01	2/17/20	1500	VAP-A5.7-MB257_02172020	GW	3		3						X	
.02	2/17/20	1610	MW-13-36R_02172020	GW	2	2								X
.03	2/18/20	1530	MW-13-35_02182020	GW	2	2								X
.04	2/17/20	—	Dup-01_02172020	GW	2	2								X
.05														

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
[signature] / arcadis (☒ Sampler)	2/18/20	1555
RECEIVED BY: SIGNATURE/ORGANIZATION: M Pilcate	2/18/2020	1555
RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS

NOTES: TEMP. ON ARRIVAL 5.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S12350-01
Generated on 03/18/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S12350.01-S12350.04
Project: 30042872 / RACER Lansing
Submitted Date/Time: 03/03/2020 16:05
Sampled by: Anyssa Mandich
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-5)
Prep Batch Summary (Page 6)
Surrogates per QC Sample (Pages 7-8)
Batch QC Results (Pages 9-13)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S12350.01
Sample Tag: MW-14-61_030320
Collected Date/Time: 03/03/2020 10:05
Matrix: Groundwater
COC Reference: 129096

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	03/05/20 08:56	NTRA200305-W1-A	NTRA200305-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	03/04/20 16:51	TKN200304QC	TKN200304QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	03/05/20 13:22	PHS200305QC	PHS200305QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 23:26	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12350.02

Sample Tag: TW-15-12_030320

Collected Date/Time: 03/03/2020 11:20

Matrix: Groundwater

COC Reference: 129096

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	03/05/20 09:09	NTRA200305-W1-A	NTRA200305-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	03/04/20 17:03	TKN200304QC	TKN200304QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	03/05/20 13:32	PHS200305QC	PHS200305QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/16/20 17:07	200316A9	VS200316W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12350.03
Sample Tag: MW-19-121_030320
Collected Date/Time: 03/03/2020 13:30
Matrix: Groundwater
COC Reference: 129096

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	03/05/20 09:22	NTRA200305-W1-A	NTRA200305-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	03/04/20 17:17	TKN200304QC	TKN200304QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	03/05/20 13:39	PHS200305QC	PHS200305QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 20:06	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12350.04
Sample Tag: TW-14-06_030320
Collected Date/Time: 03/03/2020 14:50
Matrix: Groundwater
COC Reference: 129096

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	03/05/20 09:35	NTRA200305-W1-A	NTRA200305-W1-A	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	03/04/20 17:31	TKN200304QC	TKN200304QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	03/05/20 13:59	PHS200305QC	PHS200305QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 20:29	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: NTRA200305-W1-A

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S12350.01	Nitrate-N	E300.0	03/05/20 08:56	NTRA200305-W1-A
S12350.02	Nitrate-N	E300.0	03/05/20 09:09	NTRA200305-W1-A
S12350.03	Nitrate-N	E300.0	03/05/20 09:22	NTRA200305-W1-A
S12350.04	Nitrate-N	E300.0	03/05/20 09:35	NTRA200305-W1-A

Inorganics, Prep Batch ID: PHS200305QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S12350.01	Total Phosphorus	SM4500-PE	03/05/20 13:22	PHS200305QC
S12350.02	Total Phosphorus	SM4500-PE	03/05/20 13:32	PHS200305QC
S12350.03	Total Phosphorus	SM4500-PE	03/05/20 13:39	PHS200305QC
S12350.04	Total Phosphorus	SM4500-PE	03/05/20 13:59	PHS200305QC

Inorganics, Prep Batch ID: TKN200304QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S12350.01	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	03/04/20 16:51	TKN200304QC
S12350.02	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	03/04/20 17:03	TKN200304QC
S12350.03	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	03/04/20 17:17	TKN200304QC
S12350.04	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	03/04/20 17:31	TKN200304QC

Organics - Volatiles, Prep Batch ID: VS200315W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S12350.01	1,4-Dioxane	SW8260B - SIM	03/15/20 23:26	200315A9
S12350.03	1,4-Dioxane	SW8260B - SIM	03/15/20 20:06	200315A9
S12350.04	1,4-Dioxane	SW8260B - SIM	03/15/20 20:29	200315A9

Organics - Volatiles, Prep Batch ID: VS200316W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S12350.02	1,4-Dioxane	SW8260B - SIM	03/16/20 17:07	200316A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200315W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200315A9.BLKW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:58, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 15:55, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200315A9.LCSDW15A, Parent Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:16, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200316W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200316A9.BLKW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 15:38, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:35, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200316A9.LCSDW16A, Parent Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:56, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Inorganics, Prep Batch ID: NTRA200305-W1-A

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA200305-W1-A.LRB1

Run in Batch: NTRA200305-W1-A, Run Date: 03/05/2020 08:19, Prep Date: 03/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA200305-W1-A.LCS1

Run in Batch: NTRA200305-W1-A, Run Date: 03/05/2020 08:44, Prep Date: 03/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		97	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA200305-W1-A.MS1, Parent Sample ID: S12353.01

Run in Batch: NTRA200305-W1-A, Run Date: 03/05/2020 11:17, Prep Date: 03/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		99	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA200305-W1-A.MSD1, Parent Sample ID: NTRA200305-W1-A.MS1

Run in Batch: NTRA200305-W1-A, Run Date: 03/05/2020 11:30, Prep Date: 03/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		99	80	120	0	15

Duplicate (DUP)

Lab Sample ID: NTRA200305-W1-A.DP1, Parent Sample ID: S12353.01

Run in Batch: NTRA200305-W1-A, Run Date: 03/05/2020 11:05, Prep Date: 03/05/2020, Matrix: Liquid, Dilution: 10

Analyte	Flags	RPD	RPD CL
Nitrate-N		<1	15

Inorganics, Prep Batch ID: PHS200305QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS200305QC.LRB1

Run in Batch: PHS200305QC, Run Date: 03/05/2020 12:29, Prep Date: 03/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS200305QC.LRB2

Run in Batch: PHS200305QC, Run Date: 03/05/2020 12:37, Prep Date: 03/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS200305QC.LCS1

Run in Batch: PHS200305QC, Run Date: 03/05/2020 12:52, Prep Date: 03/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		103	90	110

Matrix Spike (MS)

Lab Sample ID: PHS200305QC.MS1, Parent Sample ID: S12339.01

Run in Batch: PHS200305QC, Run Date: 03/05/2020 19:06, Prep Date: 03/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		89	80	120

Duplicate (DUP)

Lab Sample ID: PHS200305QC.DP1, Parent Sample ID: S12360.01

Run in Batch: PHS200305QC, Run Date: 03/05/2020 19:03, Prep Date: 03/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		2.3	20

Inorganics, Prep Batch ID: TKN200304QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN200304QC.LRB1

Run in Batch: TKN200304QC, Run Date: 03/04/2020 12:36, Prep Date: 03/04/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.02	mg/L

Blank (BLK)

Lab Sample ID: TKN200304QC.LRB2

Run in Batch: TKN200304QC, Run Date: 03/04/2020 14:46, Prep Date: 03/04/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN200304QC.LCS1

Run in Batch: TKN200304QC, Run Date: 03/04/2020 15:07, Prep Date: 03/04/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		97	90	110

Matrix Spike (MS)

Lab Sample ID: TKN200304QC.MS1, Parent Sample ID: S12288.02

Run in Batch: TKN200304QC, Run Date: 03/04/2020 16:12, Prep Date: 03/04/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		94	80	120

Duplicate (DUP)

Lab Sample ID: TKN200304QC.DP1, Parent Sample ID: S12288.01

Run in Batch: TKN200304QC, Run Date: 03/04/2020 15:50, Prep Date: 03/04/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		9.4	20

Organics - Volatiles, Prep Batch ID: VS200315W1

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

Blank (BLK)

Lab Sample ID: 200315A9.BLKW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:58, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.43	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 15:55, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		104.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200315A9.LCSDW15A, Parent Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:16, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		109.8	70.0	130.0	5.0	30.0

Organics - Volatiles, Prep Batch ID: VS200316W1

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

Blank (BLK)

Lab Sample ID: 200316A9.BLKW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 15:38, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.59	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:35, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		103.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200316A9.LCSDW16A, Parent Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:56, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		102.6	70.0	130.0	0.5	30.0

Merit Laboratories, Inc.
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www.meritlabs.com

C.O.C. PAGE # 1 OF 1

129096

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 26550 Cabot Dr Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-385-2494 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: michael.spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042672 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Amyssa Murdoch / Amyssa Murdoch

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☑ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	8260B-SIMS	SM4500-N(org)/NH3(EPA)	SM4500-PE (Total P)	E300.0 (Nitrate)							
12350.01	3/3/20	1005	MW-14-61_030320	GW	5	1	3		1				3	1	1	1							
.02	3/3/20	1120	TW-15-12_030320	GW	5	1	3		1				3	1	1	1							
.03	3/3/20	1330	MW-19-121_030320	GW	5	1	3		1				3	1	1	1							
.04	3/3/20	1450	TW-14-06_030320	GW	5	1	3		1				3	1	1	1							

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE	TIME
Amyssa Murdoch / Arcadis		3/3/20	1605
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		3/3/20	1605
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: TEMP. ON ARRIVAL: 5.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S12408-01
Generated on 03/18/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S12408.01-S12408.17
Project: 30042872 / RACER Lansing Plant 2
Submitted Date/Time: 03/04/2020 16:15
Sampled by: Mandich / Pisarkiewicz
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-18)
Prep Batch Summary (Page 19)
Surrogates per QC Sample (Pages 20-21)
Batch QC Results (Pages 22-23)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S12408.01

Sample Tag: MW-15-72_030220

Collected Date/Time: 03/02/2020 14:00

Matrix: Groundwater

COC Reference: 129094

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/16/20 00:11	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12408.02
Sample Tag: MW-16-74_030220
Collected Date/Time: 03/02/2020 15:25
Matrix: Groundwater
COC Reference: 129094

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 18:38	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12408.03
Sample Tag: MW-16-81_030220
Collected Date/Time: 03/02/2020 16:35
Matrix: Groundwater
COC Reference: 129094

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/16/20 16:00	200316A9	VS200316W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.04

Sample Tag: Dup-01

Collected Date/Time: 03/02/2020 00:01

Matrix: Groundwater

COC Reference: 129094

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/16/20 16:22	200316A9	VS200316W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.05

Sample Tag: Trip Blank

Collected Date/Time: 03/02/2020 00:01

Matrix: Water

COC Reference: 129094

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 17:32	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.06

Sample Tag: MW-16-84_030420

Collected Date/Time: 03/04/2020 09:10

Matrix: Groundwater

COC Reference: 129094

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 20:51	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.07

Sample Tag: MW-17-86_030420

Collected Date/Time: 03/04/2020 10:10

Matrix: Groundwater

COC Reference: 129094

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 23:04	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.08

Sample Tag: MW-19-115_030420

Collected Date/Time: 03/04/2020 11:25

Matrix: Groundwater

COC Reference: 129094

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 19:00	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.09

Sample Tag: MW-19-116_030420

Collected Date/Time: 03/04/2020 12:20

Matrix: Groundwater

COC Reference: 129094

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 21:35	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.10

Sample Tag: EB-03_030420

Collected Date/Time: 03/04/2020 13:05

Matrix: Water

COC Reference: 129094

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 17:54	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12408.11
Sample Tag: MW-19-125_030420
Collected Date/Time: 03/04/2020 09:40
Matrix: Groundwater
COC Reference: 129098

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/16/20 16:44	200316A9	VS200316W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.12

Sample Tag: MW-19-123_030420

Collected Date/Time: 03/04/2020 10:50

Matrix: Groundwater

COC Reference: 129098

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 21:13	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.13

Sample Tag: EB-02_030420

Collected Date/Time: 03/04/2020 11:00

Matrix: Water

COC Reference: 129098

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 18:16	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.14

Sample Tag: MW-19-122_030420

Collected Date/Time: 03/04/2020 12:15

Matrix: Groundwater

COC Reference: 129098

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 22:19	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.15

Sample Tag: Dup-02

Collected Date/Time: 03/04/2020 12:00

Matrix: Groundwater

COC Reference: 129098

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 19:22	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.16

Sample Tag: MW-19-120_030420

Collected Date/Time: 03/04/2020 13:50

Matrix: Groundwater

COC Reference: 129098

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 23:48	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S12408.17

Sample Tag: TW-14-02_030420

Collected Date/Time: 03/04/2020 14:45

Matrix: Groundwater

COC Reference: 129098

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/16/20 00:54	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS200315W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S12408.01	1,4-Dioxane	SW8260B - SIM	03/16/20 00:11	200315A9
S12408.02	1,4-Dioxane	SW8260B - SIM	03/15/20 18:38	200315A9
S12408.05	1,4-Dioxane	SW8260B - SIM	03/15/20 17:32	200315A9
S12408.06	1,4-Dioxane	SW8260B - SIM	03/15/20 20:51	200315A9
S12408.07	1,4-Dioxane	SW8260B - SIM	03/15/20 23:04	200315A9
S12408.08	1,4-Dioxane	SW8260B - SIM	03/15/20 19:00	200315A9
S12408.09	1,4-Dioxane	SW8260B - SIM	03/15/20 21:35	200315A9
S12408.10	1,4-Dioxane	SW8260B - SIM	03/15/20 17:54	200315A9
S12408.12	1,4-Dioxane	SW8260B - SIM	03/15/20 21:13	200315A9
S12408.13	1,4-Dioxane	SW8260B - SIM	03/15/20 18:16	200315A9
S12408.14	1,4-Dioxane	SW8260B - SIM	03/15/20 22:19	200315A9
S12408.15	1,4-Dioxane	SW8260B - SIM	03/15/20 19:22	200315A9
S12408.16	1,4-Dioxane	SW8260B - SIM	03/15/20 23:48	200315A9
S12408.17	1,4-Dioxane	SW8260B - SIM	03/16/20 00:54	200315A9

Organics - Volatiles, Prep Batch ID: VS200316W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S12408.03	1,4-Dioxane	SW8260B - SIM	03/16/20 16:00	200316A9
S12408.04	1,4-Dioxane	SW8260B - SIM	03/16/20 16:22	200316A9
S12408.11	1,4-Dioxane	SW8260B - SIM	03/16/20 16:44	200316A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200315W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200315A9.BLKW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:58, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 15:55, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200315A9.LCSDW15A, Parent Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:16, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200316W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200316A9.BLKW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 15:38, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:35, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200316A9.LCSDW16A, Parent Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:56, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS200315W1

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

Blank (BLK)

Lab Sample ID: 200315A9.BLKW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:58, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.43	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 15:55, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		104.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200315A9.LCSDW15A, Parent Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:16, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		109.8	70.0	130.0	5.0	30.0

Organics - Volatiles, Prep Batch ID: VS200316W1

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

Blank (BLK)

Lab Sample ID: 200316A9.BLKW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 15:38, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.59	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:35, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		103.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200316A9.LCSDW16A, Parent Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:56, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		102.6	70.0	130.0	0.5	30.0

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

129094

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO: 248-385-2494 FAX NO: P.O. NO:
E-MAIL ADDRESS: michael.spacil@arcadis.com QUOTE NO:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 RACER Lansing Plant 2
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Anyssa Murdock Anyssa Murdock

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B SIMS
12408.01	3/2/20	1400	MW-15-72_030220	GW	3		3						3
.02	3/2/20	1515	MW-16-74_030220	GW	3		3						3
.03	3/2/20	1635	MW-16-81_030220	GW	3		3						3
.04	3/2/20	—	DUP-01	GW	3		3						3
.05	—	—	TRIP BLANK	GW	1		1						1
.06	3/4/20	0910	MW-16-84_030420	GW	3		3						3
.07	3/4/20	1010	MW-17-86_030420	GW	3		3						3
.08	3/4/20	1125	MW-19-115_030420	GW	3		3						3
.09	3/4/20	1220	MW-19-116_030420	GW	3		3						3
.10	3/4/20	1305	EB-03_030420	GW	3		3						3

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Anyssa Murdock/Arcadis (X Sampler) DATE: 3/4/2020 TIME: 1410
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 3-4-20 TIME: 1410
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: 3-4-20 TIME: 1615
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 3/4/20 TIME: 1615

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
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C.O.C. PAGE # 2 OF 2

129098

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot dr. suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO: 248 994 2240 FAX NO: P.O. NO:
E-MAIL ADDRESS: michael.spacil@arcadis.com QUOTE NO:

INVOICE TO

CONTACT NAME: ~~SAME~~
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / Racer Lansing Plant 2
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Piserchia

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	8260B SIMS 1,4-Dioxane
12408.11	3-4-20	0940	MW-19-125_030420	GW	3		3						X
.12	3-4-20	1050	MW-19-123_030420	GW	3		3						X
.13	3-4-20	1100	EB-02_030420	W	3		3						X
.14	3-4-20	1215	MW-19-122-030420	GW	3		3						X
.15	3-4-20	PM	Dup-02	GW	3		3						X
.16	3-4-20	1350	MW-19-120_030420	GW	3		3						X
.17	3-4-20	~~1345~~	TW-14-02_030420	GW	3		3						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION ☒ Sampler DATE 3-4-20 TIME 1615
RECEIVED BY: SIGNATURE/ORGANIZATION DATE 3/4/20 TIME 1615
RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S12409-01
Generated on 03/18/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S12409.01-S12409.05
Project: 30042872 / RACER Lansing Plant 3
Submitted Date/Time: 03/04/2020 16:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-6)
Prep Batch Summary (Page 7)
Surrogates per QC Sample (Pages 8-9)
Batch QC Results (Pages 10-11)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S12409.01
Sample Tag: PW-14-03_030320
Collected Date/Time: 03/03/2020 13:55
Matrix: Groundwater
COC Reference: 129097

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/15/20 22:42	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12409.02
Sample Tag: MW-13-22_030320
Collected Date/Time: 03/03/2020 15:00
Matrix: Groundwater
COC Reference: 129097

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/16/20 19:01	200316A9	VS200316W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12409.03
Sample Tag: MW-13-22_030320 MS
Collected Date/Time: 03/03/2020 15:00
Matrix: Groundwater
COC Reference: 129097

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/16/20 19:22	200316A9	VS200316W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12409.04
Sample Tag: MW-13-22_030320 MSD
Collected Date/Time: 03/03/2020 15:00
Matrix: Groundwater
COC Reference: 129097

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/16/20 19:43	200316A9	VS200316W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S12409.05
Sample Tag: TW-15-11_030320
Collected Date/Time: 03/03/2020 16:00
Matrix: Groundwater
COC Reference: 129097

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	03/16/20 02:23	200315A9	VS200315W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS200315W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S12409.01	1,4-Dioxane	SW8260B - SIM	03/15/20 22:42	200315A9
S12409.05	1,4-Dioxane	SW8260B - SIM	03/16/20 02:23	200315A9

Organics - Volatiles, Prep Batch ID: VS200316W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S12409.02	1,4-Dioxane	SW8260B - SIM	03/16/20 19:01	200316A9
S12409.03	1,4-Dioxane	SW8260B - SIM	03/16/20 19:22	200316A9
S12409.04	1,4-Dioxane	SW8260B - SIM	03/16/20 19:43	200316A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200315W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200315A9.BLKW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:58, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 15:55, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200315A9.LCSDW15A, Parent Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:16, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200316W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200316A9.BLKW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 15:38, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:35, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200316A9.LCSDW16A, Parent Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:56, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS200315W1

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

Blank (BLK)

Lab Sample ID: 200315A9.BLKW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:58, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.43	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 15:55, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		104.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200315A9.LCSDW15A, Parent Sample ID: 200315A9.LCSW15A

Run in Batch: 200315A9, Run Date: 03/15/2020 16:16, Prep Date: 03/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		109.8	70.0	130.0	5.0	30.0

Organics - Volatiles, Prep Batch ID: VS200316W1

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

Blank (BLK)

Lab Sample ID: 200316A9.BLKW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 15:38, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.59	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:35, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		103.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200316A9.LCSDW16A, Parent Sample ID: 200316A9.LCSW16A

Run in Batch: 200316A9, Run Date: 03/16/2020 14:56, Prep Date: 03/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		102.6	70.0	130.0	0.5	30.0

Plant 3

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
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C.O.C. PAGE # 1 OF 1

129097

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 994 2240 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: michael.spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / Racer Lansing Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	8260B SIMS 1,4 Dioxane	Special Instructions
12409.01	3-3-20	1355	PW-14-03_030320	GW	3		3						X	
.02/.03/.04	3-3-20	1500	MW-13-22_030320	GW	9		9						X	MS/MSD
.05	3-3-20	1600	TW-15-11_030320	GW	3		3						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	☒ Sampler	3-4-20	1615
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		3/4/20	1615
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S12004.01(01)
Generated on 02/24/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX: 248-994-2241
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Patrick Curry

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S12004.01-S12004.05
Project: 30042872.01020 / RACER Lansing
Collected Date(s): 02/17/2020 - 02/18/2020
Submitted Date/Time: 02/18/2020 15:55
Sampled by: Austin Westhuis
P.O. #: 30042872.01020

Table of Contents

Cover Page (Page 1)
General Report Notes (Page 2)
Report Narrative (Page 2)
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Glossary of Abbreviations (Page 3)
Method Summary (Page 4)
Sample Summary (Page 5)

Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Analytical Laboratory Report

Method Summary

Method	Version
N/A	Not Applicable
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8270D	SW 846 Method 8270D Revision 4 February 2007

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Sample Summary (5 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S12004.01	VAP-A5.7-MB257_02172020	Groundwater	02/17/20 15:00
S12004.02	MW-13-36R_02172020	Groundwater	02/17/20 16:10
S12004.03	MW-13-35_02182020	Groundwater	02/18/20 15:30
S12004.04	Dup-01_02172020	Groundwater	02/17/20 00:01
S12004.05	Trip Blank	Water	02/17/20 00:01

Analytical Laboratory Report

Lab Sample ID: S12004.01
Sample Tag: VAP-A5.7-MB257_02172020
Collected Date/Time: 02/17/2020 15:00
Matrix: Groundwater
COC Reference: 133434

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/20/20 12:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/19/20 16:12, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Diethyl ether	Not detected	10		ug/L	1	60-29-7		
Acetone	Not detected	50		ug/L	1	67-64-1		
Methyl iodide	Not detected	1		ug/L	1	74-88-4		
Carbon disulfide	Not detected	5		ug/L	1	75-15-0		
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4		
Acrylonitrile	Not detected	2		ug/L	1	107-13-1		
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3		200,000
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8		
Chloromethane	Not detected	5		ug/L	1	74-87-3		
Vinyl chloride	3	1		ug/L	1	75-01-4		200
Bromomethane	Not detected	5		ug/L	1	74-83-9		
Chloroethane	Not detected	5		ug/L	1	75-00-3		
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4		
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4		700
Methylene chloride	Not detected	5		ug/L	1	75-09-2		
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5		
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3		
cis-1,2-Dichloroethene	6	1		ug/L	1	156-59-2		
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9		
Chloroform	Not detected	1		ug/L	1	67-66-3		6,000
Bromochloromethane	Not detected	1		ug/L	1	74-97-5		
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6		
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1		
2-Hexanone	Not detected	50		ug/L	1	591-78-6		
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5		500
Benzene	Not detected	1		ug/L	1	71-43-2		500
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2		500
Trichloroethene	1	1		ug/L	1	79-01-6		500
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5		
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4		
Dibromomethane	Not detected	5		ug/L	1	74-95-3		
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5		
Toluene	Not detected	1		ug/L	1	108-88-3		
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6		
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5		
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4		700
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6		

Lab Sample ID: S12004.01 (continued)
Sample Tag: VAP-A5.7-MB257_02172020

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/19/20 16:12, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1		
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4		
Chlorobenzene	Not detected	1		ug/L	1	108-90-7		100,000
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6		
Ethylbenzene	Not detected	1		ug/L	1	100-41-4		
p,m-Xylene*	Not detected	2		ug/L	1			
o-Xylene	Not detected	1		ug/L	1	95-47-6		
Styrene	Not detected	1		ug/L	1	100-42-5		
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8		
Bromoform	Not detected	1		ug/L	1	75-25-2		
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5		
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4		
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1		
Bromobenzene	Not detected	1		ug/L	1	108-86-1		
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8		
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6		
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6		
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8		
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6		
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1		
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7		7,500
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1		
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8		
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8		
Hexachloroethane	Not detected	5		ug/L	1	67-72-1		3,000
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8		
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1		
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6		
Naphthalene	Not detected	5		ug/L	1	91-20-3		
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6		

Analytical Laboratory Report

Lab Sample ID: S12004.02
Sample Tag: MW-13-36R_02172020
Collected Date/Time: 02/17/2020 16:10
Matrix: Groundwater
COC Reference: 133434

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Amber	None	Yes	5.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
BNA Extraction	Completed	SW3510C	02/20/20 15:00	BPS	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/22/20 00:14, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Acenaphthene	Not detected	5		ug/L	2	83-32-9		
Acenaphthylene	Not detected	5		ug/L	2	208-96-8		
Anthracene	Not detected	5		ug/L	2	120-12-7		
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3		
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2		
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9		
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2		
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8		
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1		
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4		
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1		
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7		
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3		
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7		
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8		
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7		
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7		
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8		
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3		
Chrysene	Not detected	1		ug/L	2	218-01-9		
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL		200,000
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7		200,000
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3		
Dibenzofuran	Not detected	4		ug/L	2	132-64-9		
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2		
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1		
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1		
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7		7,500
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1		
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2		
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2		
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9		
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3		
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1		
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5		
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2		130
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2		

Lab Sample ID: S12004.02 (continued)
Sample Tag: MW-13-36R_02172020

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/22/20 00:14, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7		
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0		
Fluoranthene	Not detected	1		ug/L	2	206-44-0		
Fluorene	Not detected	5		ug/L	2	86-73-7		
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1		130
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3		500
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4		
Hexachloroethane	Not detected	5		ug/L	2	67-72-1		3,000
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5		
Isophorone	Not detected	5		ug/L	2	78-59-1		
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6		
Naphthalene	Not detected	5		ug/L	2	91-20-3		
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4		
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2		
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6		
Nitrobenzene	Not detected	5		ug/L	2	98-95-3		2,000
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5		
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7		
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6		
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7		
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5		100,000
Phenanthrene	Not detected	2		ug/L	2	85-01-8		
Phenol	Not detected	5		ug/L	2	108-95-2		
Pyrene	Not detected	5		ug/L	2	129-00-0		
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1		
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4		400,000
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2		2,000

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Lab Sample ID: S12004.03
Sample Tag: MW-13-35_02182020
Collected Date/Time: 02/18/2020 15:30
Matrix: Groundwater
COC Reference: 133434

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Amber	None	Yes	5.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
BNA Extraction	Completed	SW3510C	02/20/20 15:00	BPS	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/22/20 00:44, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Acenaphthene	Not detected	5		ug/L	2	83-32-9		
Acenaphthylene	Not detected	5		ug/L	2	208-96-8		
Anthracene	Not detected	5		ug/L	2	120-12-7		
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3		
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2		
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9		
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2		
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8		
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1		
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4		
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1		
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7		
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3		
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7		
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8		
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7		
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7		
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8		
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3		
Chrysene	Not detected	1		ug/L	2	218-01-9		
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL		200,000
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7		200,000
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3		
Dibenzofuran	Not detected	4		ug/L	2	132-64-9		
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2		
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1		
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1		
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7		7,500
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1		
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2		
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2		
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9		
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3		
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1		
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5		
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2		130
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2		

Lab Sample ID: S12004.03 (continued)
Sample Tag: MW-13-35_02182020

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/22/20 00:44, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7		
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0		
Fluoranthene	Not detected	1		ug/L	2	206-44-0		
Fluorene	Not detected	5		ug/L	2	86-73-7		
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1		130
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3		500
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4		
Hexachloroethane	Not detected	5		ug/L	2	67-72-1		3,000
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5		
Isophorone	Not detected	5		ug/L	2	78-59-1		
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6		
Naphthalene	Not detected	5		ug/L	2	91-20-3		
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4		
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2		
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6		
Nitrobenzene	Not detected	5		ug/L	2	98-95-3		2,000
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5		
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7		
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6		
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7		
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5		100,000
Phenanthrene	Not detected	2		ug/L	2	85-01-8		
Phenol	Not detected	5		ug/L	2	108-95-2		
Pyrene	Not detected	5		ug/L	2	129-00-0		
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1		
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4		400,000
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2		2,000

Analytical Laboratory Report

Lab Sample ID: S12004.04
Sample Tag: Dup-01_02172020
Collected Date/Time: 02/17/2020 00:01
Matrix: Groundwater
COC Reference: 133434

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Amber	None	Yes	5.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
BNA Extraction	Completed	SW3510C	02/20/20 15:00	BPS	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/22/20 01:13, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Acenaphthene	Not detected	5		ug/L	2	83-32-9		
Acenaphthylene	Not detected	5		ug/L	2	208-96-8		
Anthracene	Not detected	5		ug/L	2	120-12-7		
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3		
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2		
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9		
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2		
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8		
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1		
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4		
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1		
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7		
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3		
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7		
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8		
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7		
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7		
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8		
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3		
Chrysene	Not detected	1		ug/L	2	218-01-9		
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL		200,000
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7		200,000
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3		
Dibenzofuran	Not detected	4		ug/L	2	132-64-9		
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2		
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1		
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1		
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7		7,500
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1		
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2		
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2		
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9		
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3		
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1		
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5		
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2		130
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2		

Lab Sample ID: S12004.04 (continued)
Sample Tag: Dup-01_02172020

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 02/22/20 01:13, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7		
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0		
Fluoranthene	Not detected	1		ug/L	2	206-44-0		
Fluorene	Not detected	5		ug/L	2	86-73-7		
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1		130
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3		500
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4		
Hexachloroethane	Not detected	5		ug/L	2	67-72-1		3,000
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5		
Isophorone	Not detected	5		ug/L	2	78-59-1		
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6		
Naphthalene	Not detected	5		ug/L	2	91-20-3		
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4		
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2		
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6		
Nitrobenzene	Not detected	5		ug/L	2	98-95-3		2,000
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5		
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7		
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6		
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7		
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5		100,000
Phenanthrene	Not detected	2		ug/L	2	85-01-8		
Phenol	Not detected	5		ug/L	2	108-95-2		
Pyrene	Not detected	5		ug/L	2	129-00-0		
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1		
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4		400,000
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2		2,000

Analytical Laboratory Report

Lab Sample ID: S12004.05
Sample Tag: Trip Blank
Collected Date/Time: 02/17/2020 00:01
Matrix: Water
COC Reference: 133434

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	5.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/20/20 12:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/19/20 15:33, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Diethyl ether	Not detected	10		ug/L	1	60-29-7		
Acetone	Not detected	50		ug/L	1	67-64-1		
Methyl iodide	Not detected	1		ug/L	1	74-88-4		
Carbon disulfide	Not detected	5		ug/L	1	75-15-0		
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4		
Acrylonitrile	Not detected	2		ug/L	1	107-13-1		
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3		200,000
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8		
Chloromethane	Not detected	5		ug/L	1	74-87-3		
Vinyl chloride	Not detected	1		ug/L	1	75-01-4		200
Bromomethane	Not detected	5		ug/L	1	74-83-9		
Chloroethane	Not detected	5		ug/L	1	75-00-3		
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4		
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4		700
Methylene chloride	Not detected	5		ug/L	1	75-09-2		
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5		
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3		
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2		
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9		
Chloroform	Not detected	1		ug/L	1	67-66-3		6,000
Bromochloromethane	Not detected	1		ug/L	1	74-97-5		
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6		
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1		
2-Hexanone	Not detected	50		ug/L	1	591-78-6		
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5		500
Benzene	Not detected	1		ug/L	1	71-43-2		500
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2		500
Trichloroethene	Not detected	1		ug/L	1	79-01-6		500
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5		
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4		
Dibromomethane	Not detected	5		ug/L	1	74-95-3		
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5		
Toluene	Not detected	1		ug/L	1	108-88-3		
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6		
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5		
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4		700
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6		

Lab Sample ID: S12004.05 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/19/20 15:33, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1		
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4		
Chlorobenzene	Not detected	1		ug/L	1	108-90-7		100,000
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6		
Ethylbenzene	Not detected	1		ug/L	1	100-41-4		
p,m-Xylene*	Not detected	2		ug/L	1			
o-Xylene	Not detected	1		ug/L	1	95-47-6		
Styrene	Not detected	1		ug/L	1	100-42-5		
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8		
Bromoform	Not detected	1		ug/L	1	75-25-2		
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5		
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4		
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1		
Bromobenzene	Not detected	1		ug/L	1	108-86-1		
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8		
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6		
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6		
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8		
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6		
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1		
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7		7,500
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1		
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8		
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8		
Hexachloroethane	Not detected	5		ug/L	1	67-72-1		3,000
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8		
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1		
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6		
Naphthalene	Not detected	5		ug/L	1	91-20-3		
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6		

Merit Laboratories Login Checklist

Lab Set ID:S12004
Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.01020 / RACER Lansing
Submitted:02/18/2020 15:55 Login User: MMC

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX: 248-994-2241
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[ ] Yes	[X] No	[ ] N/A	COC adequately filled out	Trip Blank not listed
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

133434

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 810-225-1928 | FAX NO.: 248-994-2241 | P.O. NO.: 30042872.01020
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 30042872.01020 / PACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____
DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MF

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs - 8260	SVOCs - 8270
12004.01	2/17/20	1500	VAP-A5.7-MB257_02172020	GW	3		3						X	
.02	2/17/20	1610	MW-13-36R_02172020	GW	2	2								X
.03	2/18/20	1530	MW-13-35_02182020	GW	2	2								X
.04	2/17/20	—	Dup-01_02172020	GW	2	2								X
.05														

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
[signature] / arcadis (☒ Sampler)	2/18/20	1555
RECEIVED BY: SIGNATURE/ORGANIZATION: M Pilcate	2/18/2020	1555
RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS

NOTES: TEMP. ON ARRIVAL 5.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S12350.01(01)
Generated on 03/17/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S12350.01-S12350.04
Project: 30042872 / RACER Lansing
Collected Date(s): 03/03/2020
Submitted Date/Time: 03/03/2020 16:05
Sampled by: Anyssa Mandich
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1
N/A	Not Applicable
SM4500-N(org)/NH	Standard Method 4500 N(org)B / NH3D 2011
SM4500-PE	Standard Method 4500 P E 2011
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Analytical Laboratory Report

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S12350.01	MW-14-61_030320	Groundwater	03/03/20 10:05
S12350.02	TW-15-12_030320	Groundwater	03/03/20 11:20
S12350.03	MW-19-121_030320	Groundwater	03/03/20 13:30
S12350.04	TW-14-06_030320	Groundwater	03/03/20 14:50

Analytical Laboratory Report

Lab Sample ID: S12350.01
Sample Tag: MW-14-61_030320
Collected Date/Time: 03/03/2020 10:05
Matrix: Groundwater
COC Reference: 129096

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	None	Yes	5.3	IR
1	250ml Plastic	H2SO4	Yes	5.3	IR
3	40ml Glass	HCL	Yes	5.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Inorganics

Method: E300.0, Run Date: 03/05/20 08:56, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 03/04/20 16:51, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.6	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 03/05/20 13:22, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.07	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 23:26, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	148	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S12350.02
Sample Tag: TW-15-12_030320
Collected Date/Time: 03/03/2020 11:20
Matrix: Groundwater
COC Reference: 129096

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	None	Yes	5.3	IR
1	250ml Plastic	H2SO4	Yes	5.3	IR
3	40ml Glass	HCL	Yes	5.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Inorganics

Method: E300.0, Run Date: 03/05/20 09:09, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 03/04/20 17:03, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.4	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 03/05/20 13:32, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.03	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/16/20 17:07, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	220	5		ug/L	5	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S12350.03
Sample Tag: MW-19-121_030320
Collected Date/Time: 03/03/2020 13:30
Matrix: Groundwater
COC Reference: 129096

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	None	Yes	5.3	IR
1	250ml Plastic	H2SO4	Yes	5.3	IR
3	40ml Glass	HCL	Yes	5.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Inorganics

Method: E300.0, Run Date: 03/05/20 09:22, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 03/04/20 17:17, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.7	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 03/05/20 13:39, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.10	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 20:06, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	119	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S12350.04
Sample Tag: TW-14-06_030320
Collected Date/Time: 03/03/2020 14:50
Matrix: Groundwater
COC Reference: 129096

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	None	Yes	5.3	IR
1	250ml Plastic	H2SO4	Yes	5.3	IR
3	40ml Glass	HCL	Yes	5.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Inorganics

Method: E300.0, Run Date: 03/05/20 09:35, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.06	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 03/04/20 17:31, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	22.4	0.4		mg/L	1		

Method: SM4500-PE, Run Date: 03/05/20 13:59, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	29	3	2	mg/L	250	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 20:29, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	23	1		ug/L	1	123-91-1	

Merit Laboratories Login Checklist

Lab Set ID: S12350
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / RACER Lansing
Submitted: 03/03/2020 16:05 Login User: SRS

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.3
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S12350 Initials: SRS

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30042872 / RACER Lansing

Submitted: 03/03/2020 16:05 Login User:

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Lab ID	125 ml Plastic HNO_3	250 ml Plastic HNO_3	1 L Plastic HNO_3	250 ml Plastic H_2SO_4	125 ml Amber H_2SO_4	32 oz Glass HCl	125 ml Plastic NaOH	125 ml Amber $PbCO_3$ NaOH	pH					Notes
									<2	>12	other	ml add	new pH	
S12350.01				X					X					
S12350.02				X					X					
S12350.03				X					X					
S12350.04				X							5	0.5	<2	Lot# 222815

Prepared by Merit Laboratories

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

129096

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 26550 Cabot Dr Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-385-2494 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: michael.spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042672 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Amyssa Murdoch / Amyssa Murdoch

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☑ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	8260B-SIMS	SM4500-N(org)/NH3(EPA)	SM4500-PE (Total P)	E300.0 (Nitrate)							
12350.01	3/3/20	1005	MW-14-61_030320	GW	5	1	3		1				3	1	1	1							
.02	3/3/20	1120	TW-15-12_030320	GW	5	1	3		1				3	1	1	1							
.03	3/3/20	1330	MW-19-121_030320	GW	5	1	3		1				3	1	1	1							
.04	3/3/20	1450	TW-14-06_030320	GW	5	1	3		1				3	1	1	1							

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE	TIME
Amyssa Murdoch / Arcadis		3/3/20	1605
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		3/3/20	1605
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: TEMP. ON ARRIVAL: 5.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S12408.01(01)
Generated on 03/17/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S12408.01-S12408.17
Project: 30042872 / RACER Lansing Plant 2
Collected Date(s): 03/02/2020 - 03/04/2020
Submitted Date/Time: 03/04/2020 16:15
Sampled by: Mandich / Pisarkiewicz
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (17 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S12408.01	MW-15-72_030220	Groundwater	03/02/20 14:00
S12408.02	MW-16-74_030220	Groundwater	03/02/20 15:25
S12408.03	MW-16-81_030220	Groundwater	03/02/20 16:35
S12408.04	Dup-01	Groundwater	03/02/20 00:01
S12408.05	Trip Blank	Water	03/02/20 00:01
S12408.06	MW-16-84_030420	Groundwater	03/04/20 09:10
S12408.07	MW-17-86_030420	Groundwater	03/04/20 10:10
S12408.08	MW-19-115_030420	Groundwater	03/04/20 11:25
S12408.09	MW-19-116_030420	Groundwater	03/04/20 12:20
S12408.10	EB-03_030420	Water	03/04/20 13:05
S12408.11	MW-19-125_030420	Groundwater	03/04/20 09:40
S12408.12	MW-19-123_030420	Groundwater	03/04/20 10:50
S12408.13	EB-02_030420	Water	03/04/20 11:00
S12408.14	MW-19-122_030420	Groundwater	03/04/20 12:15
S12408.15	Dup-02	Groundwater	03/04/20 12:00
S12408.16	MW-19-120_030420	Groundwater	03/04/20 13:50
S12408.17	TW-14-02_030420	Groundwater	03/04/20 14:45

Analytical Laboratory Report

Lab Sample ID: S12408.01
Sample Tag: MW-15-72_030220
Collected Date/Time: 03/02/2020 14:00
Matrix: Groundwater
COC Reference: 129094

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/16/20 00:11, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	150	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S12408.02
Sample Tag: MW-16-74_030220
Collected Date/Time: 03/02/2020 15:25
Matrix: Groundwater
COC Reference: 129094

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 18:38, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S12408.03
Sample Tag: MW-16-81_030220
Collected Date/Time: 03/02/2020 16:35
Matrix: Groundwater
COC Reference: 129094

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/16/20 16:00, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2,600	100		ug/L	100	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S12408.04
Sample Tag: Dup-01
Collected Date/Time: 03/02/2020 00:01
Matrix: Groundwater
COC Reference: 129094

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	>2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/16/20 16:22, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2,700	100		ug/L	100	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S12408.05
Sample Tag: Trip Blank
Collected Date/Time: 03/02/2020 00:01
Matrix: Water
COC Reference: 129094

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 17:32, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S12408.06
Sample Tag: MW-16-84_030420
Collected Date/Time: 03/04/2020 09:10
Matrix: Groundwater
COC Reference: 129094

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 20:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	66	1		ug/L	1	123-91-1	

Lab Sample ID: S12408.07
Sample Tag: MW-17-86_030420
Collected Date/Time: 03/04/2020 10:10
Matrix: Groundwater
COC Reference: 129094

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 23:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	99	1		ug/L	1	123-91-1	

Lab Sample ID: S12408.08
Sample Tag: MW-19-115_030420
Collected Date/Time: 03/04/2020 11:25
Matrix: Groundwater
COC Reference: 129094

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 19:00, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	9	1		ug/L	1	123-91-1	

Lab Sample ID: S12408.09
Sample Tag: MW-19-116_030420
Collected Date/Time: 03/04/2020 12:20
Matrix: Groundwater
COC Reference: 129094

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 21:35, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	60	1		ug/L	1	123-91-1	

Lab Sample ID: S12408.10
Sample Tag: EB-03_030420
Collected Date/Time: 03/04/2020 13:05
Matrix: Water
COC Reference: 129094

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 17:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S12408.11
Sample Tag: MW-19-125_030420
Collected Date/Time: 03/04/2020 09:40
Matrix: Groundwater
COC Reference: 129098

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/16/20 16:44, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S12408.12
Sample Tag: MW-19-123_030420
Collected Date/Time: 03/04/2020 10:50
Matrix: Groundwater
COC Reference: 129098

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 21:13, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	76	1		ug/L	1	123-91-1	

Lab Sample ID: S12408.13
Sample Tag: EB-02_030420
Collected Date/Time: 03/04/2020 11:00
Matrix: Water
COC Reference: 129098

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 18:16, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S12408.14
Sample Tag: MW-19-122_030420
Collected Date/Time: 03/04/2020 12:15
Matrix: Groundwater
COC Reference: 129098

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 22:19, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	41	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S12408.15
Sample Tag: Dup-02
Collected Date/Time: 03/04/2020 12:00
Matrix: Groundwater
COC Reference: 129098

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 19:22, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	41	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S12408.16
Sample Tag: MW-19-120_030420
Collected Date/Time: 03/04/2020 13:50
Matrix: Groundwater
COC Reference: 129098

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 23:48, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	198	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S12408.17
Sample Tag: TW-14-02_030420
Collected Date/Time: 03/04/2020 14:45
Matrix: Groundwater
COC Reference: 129098

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/16/20 00:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	470	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Merit Laboratories Login Checklist

Lab Set ID: S12408
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / RACER Lansing Plant 2
Submitted: 03/04/2020 16:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[X] Yes	[ ] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	All three VOAs for samples .03 and .10 contained headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 2

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

129094

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO: 248-385-2494 FAX NO: P.O. NO:
E-MAIL ADDRESS: michael.spacil@arcadis.com QUOTE NO:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 RACER Lansing Plant 2
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Anyssa Murdock Anyssa Murdock

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B SIMS
12408.01	3/2/20	1400	MW-15-72_030220	GW	3		3						3
.02	3/2/20	1515	MW-16-74_030220	GW	3		3						3
.03	3/2/20	1635	MW-16-81_030220	GW	3		3						3
.04	3/2/20	—	DUP-01	GW	3		3						3
.05	—	—	TRIP BLANK	GW	1		1						1
.06	3/4/20	0910	MW-16-84_030420	GW	3		3						3
.07	3/4/20	1010	MW-17-86_030420	GW	3		3						3
.08	3/4/20	1125	MW-19-115_030420	GW	3		3						3
.09	3/4/20	1220	MW-19-116_030420	GW	3		3						3
.10	3/4/20	1305	EB-03_030420	GW	3		3						3

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Anyssa Murdock/Arcadis (X Sampler) DATE: 3/4/2020 TIME: 1410
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 3-4-20 TIME: 1410
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: 3-4-20 TIME: 1615
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 3/4/20 TIME: 1615

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 2 OF 2

129098

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot dr. suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO: 248 994 2240 FAX NO: P.O. NO:
E-MAIL ADDRESS: michael.spacil@arcadis.com QUOTE NO:

INVOICE TO

CONTACT NAME: ~~SAME~~
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / Racer Lansing Plant 2
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Piserchia

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	8260B SIMS 1,4-Dioxane
12408.11	3-4-20	0940	MW-19-125_030420	GW	3		3						X
.12	3-4-20	1050	MW-19-123_030420	GW	3		3						X
.13	3-4-20	1100	EB-02_030420	W	3		3						X
.14	3-4-20	1215	MW-19-122-030420	GW	3		3						X
.15	3-4-20	PM	Dup-02	GW	3		3						X
.16	3-4-20	1350	MW-19-120_030420	GW	3		3						X
.17	3-4-20	~~1345~~	TW-14-02_030420	GW	3		3						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION ☒ Sampler DATE 3-4-20 TIME 1615
RECEIVED BY: SIGNATURE/ORGANIZATION DATE 3/4/20 TIME 1615
RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S12409.01(01)
Generated on 03/17/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S12409.01-S12409.05
Project: 30042872 / RACER Lansing Plant 3
Collected Date(s): 03/03/2020
Submitted Date/Time: 03/04/2020 16:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

Table of Contents

Cover Page (Page 1)
General Report Notes (Page 2)
Report Narrative (Page 2)
Laboratory Certifications (Page 3)
Qualifier Descriptions (Page 3)
Glossary of Abbreviations (Page 3)
Method Summary (Page 4)
Sample Summary (Page 5)

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (5 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S12409.01	PW-14-03_030320	Groundwater	03/03/20 13:55
S12409.02	MW-13-22_030320	Groundwater	03/03/20 15:00
S12409.03	MW-13-22_030320 MS	Groundwater	03/03/20 15:00
S12409.04	MW-13-22_030320 MSD	Groundwater	03/03/20 15:00
S12409.05	TW-15-11_030320	Groundwater	03/03/20 16:00

Analytical Laboratory Report

Lab Sample ID: S12409.01
Sample Tag: PW-14-03_030320
Collected Date/Time: 03/03/2020 13:55
Matrix: Groundwater
COC Reference: 129097

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/15/20 22:42, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	75	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S12409.02
Sample Tag: MW-13-22_030320
Collected Date/Time: 03/03/2020 15:00
Matrix: Groundwater
COC Reference: 129097

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/16/20 19:01, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	203	5		ug/L	5	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S12409.03
Sample Tag: MW-13-22_030320 MS
Collected Date/Time: 03/03/2020 15:00
Matrix: Groundwater
COC Reference: 129097

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/16/20 19:22, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	394	5		ug/L	5	123-91-1	Y1

Y-Elevated reporting limit due to high target concentration 1-Spiked at 250ug/L

Analytical Laboratory Report

Lab Sample ID: S12409.04
Sample Tag: MW-13-22_030320 MSD
Collected Date/Time: 03/03/2020 15:00
Matrix: Groundwater
COC Reference: 129097

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/16/20 19:43, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	416	5		ug/L	5	123-91-1	Y1

Y-Elevated reporting limit due to high target concentration 1-Spiked at 250ug/L

Analytical Laboratory Report

Lab Sample ID: S12409.05
Sample Tag: TW-15-11_030320
Collected Date/Time: 03/03/2020 16:00
Matrix: Groundwater
COC Reference: 129097

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	03/16/20 14:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 03/16/20 02:23, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	130	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Merit Laboratories Login Checklist

Lab Set ID:S12409
Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / RACER Lansing Plant 3
Submitted:03/04/2020 16:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 3

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

129097

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 994 2240 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: michael.spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / Racer Lansing Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	8260B SIMS 1,4 Dioxane	Special Instructions
12409.01	3-3-20	1355	PW-14-03_030320	GW	3		3						X	
.02/.03/.04	3-3-20	1500	MW-13-22_030320	GW	9		9						X	MS/MSD
.05	3-3-20	1600	TW-15-11_030320	GW	3		3						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	☒ Sampler	3-4-20	1615
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		3/4/20	1615
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA73111

Sampling Dates: 03/02/20 - 03/03/20

Report to:

Arcadis

daniel.stockard@arcadis.com

ATTN: Daniel Stockard

Total number of pages in report: **36**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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Please share your ideas about how we can serve you better at:
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Sample Summary

Arcadis

Job No: FA73111

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
This report contains results reported as ND = Not detected. The following applies: Organics ND = Not detected above the MDL							
FA73111-1	03/02/20	13:55	AW	03/04/20	AQ	Ground Water	MW-18-99_030220
FA73111-2	03/02/20	14:45	AW	03/04/20	AQ	Ground Water	MW-18-98_030220
FA73111-3	03/02/20	16:05	AW	03/04/20	AQ	Ground Water	MW-18-91_030220
FA73111-4	03/02/20	16:50	AW	03/04/20	AQ	Ground Water	MW-18-88_030220
FA73111-5	03/02/20	17:55	AW	03/04/20	AQ	Ground Water	MW-18-95_030220
FA73111-6	03/02/20	00:00	AW	03/04/20	AQ	Ground Water	DUP-03_030220
FA73111-7	03/03/20	10:15	AW	03/04/20	AQ	Ground Water	MW-18-105_030320
FA73111-8	03/03/20	10:55	AW	03/04/20	AQ	Ground Water	MW-18-103_030320
FA73111-8D	03/03/20	10:55	AW	03/04/20	AQ	Water Dup/MSD	MW-18-103_030320
FA73111-8S	03/03/20	10:55	AW	03/04/20	AQ	Water Matrix Spike	MW-18-103_030320
FA73111-9	03/03/20	12:30	AW	03/04/20	AQ	Ground Water	MW-18-89_030320
FA73111-10	03/03/20	13:30	AW	03/04/20	AQ	Ground Water	MW-18-90_030320

Sample Summary
(continued)

Arcadis

Job No: FA73111

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA73111-11	03/03/20	14:20	AW	03/04/20	AQ	Ground Water	UNK-15_030320
FA73111-12	03/03/20	14:35	AW	03/04/20	AQ	Equipment Blank	EB-01_030320

Summary of Hits

Job Number: FA73111
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 03/02/20 thru 03/03/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA73111-1	**MW-18-99_030220**					
Perfluorobutanoic acid		0.0119	0.0074	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0031 J	0.0037	0.0014	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0022 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0020 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0039	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0011 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0467	0.0037	0.0014	ug/l	EPA 537M BY ID
FA73111-2	**MW-18-98_030220**					
Perfluorobutanoic acid		0.0062 J	0.0074	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0037	0.0037	0.0014	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0033 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0024 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0094	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0020 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.00099 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0013 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0752	0.0037	0.0014	ug/l	EPA 537M BY ID
FA73111-3	**MW-18-91_030220**					
Perfluorobutanoic acid		0.0089	0.0074	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0038	0.0037	0.0014	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0033 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0040	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0079	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0011 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0019 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0018 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0471	0.0037	0.0014	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0047	0.0037	0.00093	ug/l	EPA 537M BY ID
FA73111-4	**MW-18-88_030220**					
Perfluorobutanoic acid		0.0048 J	0.0074	0.0019	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0031 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0020 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0015 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0461	0.0037	0.0014	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA73111
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 03/02/20 thru 03/03/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA73111-5	**MW-18-95_030220**					
Perfluorobutanoic acid		0.0058 J	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0029 J	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0022 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0017 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0041	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0048	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0381	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0020 J	0.0034	0.00086	ug/l	EPA 537M BY ID
FA73111-6	**DUP-03_030220**					
Perfluorobutanoic acid		0.0052 J	0.0074	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0026 J	0.0037	0.0014	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0013 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0013 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0035 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0041	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0385	0.0037	0.0014	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0020 J	0.0037	0.00093	ug/l	EPA 537M BY ID
FA73111-7	**MW-18-105_030320**					
Perfluorobutanoic acid		0.0029 J	0.0074	0.0019	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0016 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0035 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0017 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0124	0.0037	0.0014	ug/l	EPA 537M BY ID
FA73111-8	**MW-18-103_030320**					
Perfluorobutanesulfonic acid		0.0041	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0027 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0168	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0020 J	0.0037	0.0014	ug/l	EPA 537M BY ID
FA73111-9	**MW-18-89_030320**					
Perfluorobutanoic acid		0.0097	0.0074	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0082	0.0037	0.0014	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0052	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0048	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0101	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.00099 J	0.0037	0.00093	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA73111
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 03/02/20 thru 03/03/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorodecanoic acid		0.0011 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0035 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0025 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.120	0.0037	0.0014	ug/l	EPA 537M BY ID
FA73111-10	**MW-18-90_030320**					
Perfluorobutanoic acid		0.0078	0.0074	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0045	0.0037	0.0014	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0035 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0035 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0126	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0011 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0013 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0071	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0029 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0204	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0362	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.920	0.019	0.0069	ug/l	EPA 537M BY ID
FA73111-11	**UNK-15_030320**					
Perfluorobutanoic acid		0.0158	0.0074	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0146	0.0037	0.0014	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0096	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0077	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0266	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0033 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0012 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0019 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0015 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0106	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0136	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.810	0.019	0.0069	ug/l	EPA 537M BY ID
FA73111-12	**EB-01_030320**					
Perfluorohexanoic acid		0.00098 J	0.0037	0.00093	ug/l	EPA 537M BY ID

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-18-99_030220		
Lab Sample ID:	FA73111-1	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45317.D	1	03/10/20 01:04	NAF	03/07/20 13:00	OP79290	S2Q681
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0119	0.0074	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0031	0.0037	0.0014	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0022	0.0037	0.00093	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0020	0.0037	0.00093	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0039	0.0037	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0037	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0037	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0037	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0037	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0037	0.00093	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0037	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0467	0.0037	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-99_030220		
Lab Sample ID:	FA73111-1	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	93%		35-135%
	13C5-PFPeA	89%		50-150%
	13C5-PFHxA	88%		50-150%
	13C4-PFHpA	84%		50-150%
	13C8-PFOA	91%		50-150%
	13C9-PFNA	92%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	89%		40-140%
	13C2-PFDoDA	85%		40-140%
	13C2-PFTeDA	84%		30-130%
	13C3-PFBS	92%		50-150%
	13C3-PFHxS	86%		50-150%
	13C8-PFOS	78%		50-150%
	13C8-FOSA	70%		30-130%
	d3-MeFOSAA	106%		50-150%
	13C2-4:2FTS	90%		50-150%
	13C2-6:2FTS	98%		50-150%
	13C2-8:2FTS	91%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-98_030220		
Lab Sample ID:	FA73111-2	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45318.D	1	03/10/20 01:19	NAF	03/07/20 13:00	OP79290	S2Q681
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0062	0.0074	0.0019	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0037	0.0037	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	0.0033	0.0037	0.00093	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0024	0.0037	0.00093	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0094	0.0037	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0037	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0037	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0020	0.0037	0.00093	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0037	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.00099	0.0037	0.00093	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.0013	0.0037	0.00093	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0752	0.0037	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-98_030220		
Lab Sample ID:	FA73111-2	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	90%		35-135%
	13C5-PFPeA	89%		50-150%
	13C5-PFHxA	90%		50-150%
	13C4-PFHpA	86%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	91%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	89%		40-140%
	13C2-PFDoDA	82%		40-140%
	13C2-PFTeDA	77%		30-130%
	13C3-PFBS	91%		50-150%
	13C3-PFHxS	86%		50-150%
	13C8-PFOS	80%		50-150%
	13C8-FOSA	72%		30-130%
	d3-MeFOSAA	99%		50-150%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	97%		50-150%
	13C2-8:2FTS	87%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-91_030220		
Lab Sample ID:	FA73111-3	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45319.D	1	03/10/20 01:35	NAF	03/07/20 13:00	OP79290	S2Q681
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0089	0.0074	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0038	0.0037	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	0.0033	0.0037	0.00093	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0040	0.0037	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0079	0.0037	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	0.0011	0.0037	0.00093	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0037	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0019	0.0037	0.00093	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0037	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0018	0.0037	0.00093	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0037	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0471	0.0037	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0047	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-91_030220		
Lab Sample ID:	FA73111-3	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	79%		35-135%
	13C5-PFPeA	77%		50-150%
	13C5-PFHxA	74%		50-150%
	13C4-PFHpA	73%		50-150%
	13C8-PFOA	81%		50-150%
	13C9-PFNA	83%		50-150%
	13C6-PFDA	78%		50-150%
	13C7-PFUnDA	80%		40-140%
	13C2-PFDoDA	76%		40-140%
	13C2-PFTeDA	89%		30-130%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	76%		50-150%
	13C8-FOSA	34%		30-130%
	d3-MeFOSAA	105%		50-150%
	13C2-4:2FTS	81%		50-150%
	13C2-6:2FTS	93%		50-150%
	13C2-8:2FTS	97%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-88_030220		
Lab Sample ID:	FA73111-4	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45320.D	1	03/10/20 01:50	NAF	03/07/20 13:00	OP79290	S2Q681
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0048	0.0074	0.0019	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0037	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0037	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0037	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0031	0.0037	0.00093	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0037	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0037	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0020	0.0037	0.00093	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0037	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0015	0.0037	0.00093	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0037	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0461	0.0037	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

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RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-88_030220		
Lab Sample ID:	FA73111-4	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	88%		35-135%
	13C5-PFPeA	86%		50-150%
	13C5-PFHxA	85%		50-150%
	13C4-PFHpA	81%		50-150%
	13C8-PFOA	88%		50-150%
	13C9-PFNA	89%		50-150%
	13C6-PFDA	88%		50-150%
	13C7-PFUnDA	90%		40-140%
	13C2-PFDoDA	84%		40-140%
	13C2-PFTeDA	80%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	79%		50-150%
	13C8-FOSA	75%		30-130%
	d3-MeFOSAA	99%		50-150%
	13C2-4:2FTS	88%		50-150%
	13C2-6:2FTS	95%		50-150%
	13C2-8:2FTS	87%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-95_030220		
Lab Sample ID:	FA73111-5	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q18389.D	1	03/13/20 21:27	NG	03/11/20 12:30	OP79346	S3Q283
Run #2 [a]	2Q45321.D	1	03/10/20 02:05	NAF	03/07/20 13:00	OP79290	S2Q681

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2	270 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0058	0.0069	0.0017	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0029	0.0034	0.0013	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0022	0.0034	0.00086	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0017	0.0034	0.00086	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0041	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid [b]	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0048	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0381	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0020	0.0034	0.00086	ug/l	J
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA [b]	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
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E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-95_030220		
Lab Sample ID:	FA73111-5	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%	36%	35-135%
	13C5-PFPeA	62%	34% [c]	50-150%
	13C5-PFHxA	58%	33% [c]	50-150%
	13C4-PFHpA	54%	31% [c]	50-150%
	13C8-PFOA	52%	33% [c]	50-150%
	13C9-PFNA	48% [c]	33% [c]	50-150%
	13C6-PFDA	55%	32% [c]	50-150%
	13C7-PFUnDA	57%	34% [c]	40-140%
	13C2-PFDoDA	60%	32% [c]	40-140%
	13C2-PFTeDA	63%	32%	30-130%
	13C3-PFBS	62%	35% [c]	50-150%
	13C3-PFHxS	51%	33% [c]	50-150%
	13C8-PFOS	52%	30% [c]	50-150%
	13C8-FOSA	26% [c]	24% [c]	30-130%
	d3-MeFOSAA	84%	44% [c]	50-150%
	13C2-4:2FTS	63%	35% [c]	50-150%
	13C2-6:2FTS	60%	36% [c]	50-150%
	13C2-8:2FTS	73%	35% [c]	50-150%

(a) Confirmation run.
(b) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
(c) Outside control limits due to matrix interference.

ND = Not detected MDL = Method Detection Limit
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E = Indicates value exceeds calibration range
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Report of Analysis

Client Sample ID:	DUP-03_030220		
Lab Sample ID:	FA73111-6	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45322.D	1	03/10/20 02:21	NAF	03/07/20 13:00	OP79290	S2Q681
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0052	0.0074	0.0019	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0026	0.0037	0.0014	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0013	0.0037	0.00093	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0013	0.0037	0.00093	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0035	0.0037	0.00093	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0037	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0037	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0041	0.0037	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0037	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0037	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0037	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0385	0.0037	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0020	0.0037	0.00093	ug/l	J
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-03_030220		
Lab Sample ID:	FA73111-6	**Date Sampled:**	03/02/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	87%		35-135%
	13C5-PFPeA	83%		50-150%
	13C5-PFHxA	80%		50-150%
	13C4-PFHpA	77%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	85%		50-150%
	13C6-PFDA	80%		50-150%
	13C7-PFUnDA	84%		40-140%
	13C2-PFDoDA	82%		40-140%
	13C2-PFTeDA	83%		30-130%
	13C3-PFBS	86%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	75%		50-150%
	13C8-FOSA	37%		30-130%
	d3-MeFOSAA	113%		50-150%
	13C2-4:2FTS	86%		50-150%
	13C2-6:2FTS	95%		50-150%
	13C2-8:2FTS	95%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-105_030320		
Lab Sample ID:	FA73111-7	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45323.D	1	03/10/20 02:36	NAF	03/07/20 13:00	OP79290	S2Q681
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0029	0.0074	0.0019	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0037	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0037	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0037	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0016	0.0037	0.00093	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0037	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0037	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0035	0.0037	0.00093	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0037	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0017	0.0037	0.00093	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0037	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0124	0.0037	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-105_030320		
Lab Sample ID:	FA73111-7	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	82%		35-135%
	13C5-PFPeA	84%		50-150%
	13C5-PFHxA	87%		50-150%
	13C4-PFHpA	85%		50-150%
	13C8-PFOA	94%		50-150%
	13C9-PFNA	91%		50-150%
	13C6-PFDA	84%		50-150%
	13C7-PFUnDA	86%		40-140%
	13C2-PFDoDA	81%		40-140%
	13C2-PFTeDA	79%		30-130%
	13C3-PFBS	87%		50-150%
	13C3-PFHxS	86%		50-150%
	13C8-PFOS	79%		50-150%
	13C8-FOSA	84%		30-130%
	d3-MeFOSAA	90%		50-150%
	13C2-4:2FTS	88%		50-150%
	13C2-6:2FTS	94%		50-150%
	13C2-8:2FTS	80%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-103_030320		
Lab Sample ID:	FA73111-8	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45326.D	1	03/10/20 03:22	NAF	03/07/20 13:00	OP79290	S2Q681
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0074	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0037	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0037	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0037	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0037	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0037	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0037	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0041	0.0037	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0027	0.0037	0.00093	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0168	0.0037	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0037	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0020	0.0037	0.0014	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-103_030320		
Lab Sample ID:	FA73111-8	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	87%		35-135%
	13C5-PFPeA	89%		50-150%
	13C5-PFHxA	90%		50-150%
	13C4-PFHpA	89%		50-150%
	13C8-PFOA	97%		50-150%
	13C9-PFNA	94%		50-150%
	13C6-PFDA	87%		50-150%
	13C7-PFUnDA	86%		40-140%
	13C2-PFDoDA	81%		40-140%
	13C2-PFTeDA	79%		30-130%
	13C3-PFBS	90%		50-150%
	13C3-PFHxS	91%		50-150%
	13C8-PFOS	84%		50-150%
	13C8-FOSA	89%		30-130%
	d3-MeFOSAA	89%		50-150%
	13C2-4:2FTS	88%		50-150%
	13C2-6:2FTS	94%		50-150%
	13C2-8:2FTS	80%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-89_030320		
Lab Sample ID:	FA73111-9	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45329.D	1	03/10/20 04:08	NAF	03/07/20 13:00	OP79290	S2Q681
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0097	0.0074	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0082	0.0037	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	0.0052	0.0037	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0048	0.0037	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0101	0.0037	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	0.00099	0.0037	0.00093	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0011	0.0037	0.00093	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0037	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0037	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0035	0.0037	0.00093	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.0025	0.0037	0.00093	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.120	0.0037	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-89_030320		
Lab Sample ID:	FA73111-9	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	83%		35-135%
	13C5-PFPeA	80%		50-150%
	13C5-PFHxA	78%		50-150%
	13C4-PFHpA	76%		50-150%
	13C8-PFOA	82%		50-150%
	13C9-PFNA	79%		50-150%
	13C6-PFDA	72%		50-150%
	13C7-PFUnDA	80%		40-140%
	13C2-PFDoDA	80%		40-140%
	13C2-PFTeDA	83%		30-130%
	13C3-PFBS	82%		50-150%
	13C3-PFHxS	80%		50-150%
	13C8-PFOS	68%		50-150%
	13C8-FOSA	41%		30-130%
	d3-MeFOSAA	103%		50-150%
	13C2-4:2FTS	85%		50-150%
	13C2-6:2FTS	92%		50-150%
	13C2-8:2FTS	83%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-90_030320		
Lab Sample ID:	FA73111-10	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45330.D	1	03/10/20 04:24	NAF	03/07/20 13:00	OP79290	S2Q681
Run #2	2Q45372.D	5	03/10/20 15:28	NAF	03/07/20 13:00	OP79290	S2Q682

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2	270 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0078	0.0074	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0045	0.0037	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	0.0035	0.0037	0.00093	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0035	0.0037	0.00093	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0126	0.0037	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	0.0011	0.0037	0.00093	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0013	0.0037	0.00093	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0071	0.0037	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0029	0.0037	0.00093	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0204	0.0037	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0362	0.0037	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.920 [a]	0.019	0.0069	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-90_030320		
Lab Sample ID:	FA73111-10	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	80%	91%	35-135%
	13C5-PFPeA	77%	87%	50-150%
	13C5-PFHxA	75%	85%	50-150%
	13C4-PFHpA	74%	80%	50-150%
	13C8-PFOA	79%	85%	50-150%
	13C9-PFNA	78%	84%	50-150%
	13C6-PFDA	72%	78%	50-150%
	13C7-PFUnDA	72%	77%	40-140%
	13C2-PFDoDA	78%	80%	40-140%
	13C2-PFTeDA	70%	67%	30-130%
	13C3-PFBS	82%	90%	50-150%
	13C3-PFHxS	79%	85%	50-150%
	13C8-PFOS	72%	78%	50-150%
	13C8-FOSA	38%	76%	30-130%
	d3-MeFOSAA	92%	79%	50-150%
	13C2-4:2FTS	79%	78%	50-150%
	13C2-6:2FTS	90%	85%	50-150%
	13C2-8:2FTS	83%	74%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNK-15_030320		
Lab Sample ID:	FA73111-11	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45331.D	1	03/10/20 04:39	NAF	03/07/20 13:00	OP79290	S2Q681
Run #2	2Q45373.D	5	03/10/20 15:44	NAF	03/07/20 13:00	OP79290	S2Q682

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2	270 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0158	0.0074	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0146	0.0037	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	0.0096	0.0037	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0077	0.0037	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0266	0.0037	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	0.0033	0.0037	0.00093	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0012	0.0037	0.00093	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0019	0.0037	0.00093	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0015	0.0037	0.00093	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0106	0.0037	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0136	0.0037	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.810 [a]	0.019	0.0069	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNK-15_030320		
Lab Sample ID:	FA73111-11	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	84%	97%	35-135%
	13C5-PFPeA	80%	94%	50-150%
	13C5-PFHxA	79%	91%	50-150%
	13C4-PFHpA	70%	86%	50-150%
	13C8-PFOA	79%	92%	50-150%
	13C9-PFNA	79%	93%	50-150%
	13C6-PFDA	77%	88%	50-150%
	13C7-PFUnDA	85%	88%	40-140%
	13C2-PFDoDA	83%	84%	40-140%
	13C2-PFTeDA	81%	81%	30-130%
	13C3-PFBS	83%	97%	50-150%
	13C3-PFHxS	81%	90%	50-150%
	13C8-PFOS	70%	84%	50-150%
	13C8-FOSA	44%	93%	30-130%
	d3-MeFOSAA	104%	92%	50-150%
	13C2-4:2FTS	83%	85%	50-150%
	13C2-6:2FTS	84%	87%	50-150%
	13C2-8:2FTS	85%	82%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-01_030320		
Lab Sample ID:	FA73111-12	**Date Sampled:**	03/03/20
Matrix:	AQ - Equipment Blank	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45332.D	1	03/10/20 04:54	NAF	03/07/20 13:00	OP79290	S2Q681
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0074	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0037	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	0.00098	0.0037	0.00093	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0037	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0037	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0037	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0037	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0037	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0037	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0037	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0037	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0037	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-01_030320		
Lab Sample ID:	FA73111-12	**Date Sampled:**	03/03/20
Matrix:	AQ - Equipment Blank	**Date Received:**	03/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	107%		35-135%
	13C5-PFPeA	103%		50-150%
	13C5-PFHxA	103%		50-150%
	13C4-PFHpA	100%		50-150%
	13C8-PFOA	105%		50-150%
	13C9-PFNA	99%		50-150%
	13C6-PFDA	90%		50-150%
	13C7-PFUnDA	93%		40-140%
	13C2-PFDoDA	91%		40-140%
	13C2-PFTeDA	85%		30-130%
	13C3-PFBS	103%		50-150%
	13C3-PFHxS	101%		50-150%
	13C8-PFOS	87%		50-150%
	13C8-FOSA	94%		30-130%
	d3-MeFOSAA	94%		50-150%
	13C2-4:2FTS	97%		50-150%
	13C2-6:2FTS	100%		50-150%
	13C2-8:2FTS	83%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA73111
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

SGS North America Inc - Orlando
Chain of Custody

SGS Plant 3

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB #: FA73111 PAGE 1 OF 1

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis of Michigan, LLC
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Michael.Spacil@arcadis.com Email:
Phone #: 313-407-8332
Sampler(s) Name(s) (Printed)
Sampler 1: Austin Westhuis Sampler 2:

Project Information

Project Name: RACER Lansing Plant 3
Street: 2801 W. Saginaw St.
City: Lansing State: MI
Project #: 30042872.03700
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via Method 537 mod. with isotope dilution per QSM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZnAc	DI WATER	MEOH	LAB USE ONLY
1	MW-18-99_030220	3/3/20	1350	AW	GW	2		2							X	
2	MW-18-98_030220	3/2/20	1445	AW	GW	2		2							X	
3	MW-18-91_030220	3/2/20	1605	AW	GW	2		2							X	
4	MW-18-88_030220	3/2/20	1650	AW	GW	2		2							X	
5	MW-18-95_030220	3/2/20	1755	AW	GW	2		2							X	
6	Dup-03_030220	3/2/20	----	AW	GW	2		2							X	
7	MW-18-105_030320	3/3/20	1015	AW	GW	2		2							X	
8	MW-18-103_030320 MS/MSD	3/3/20	1055	AW	GW	6		6							X	
9	MW-18-89_030320	3/3/20	1230	AW	GW	2		2							X	
10	MW-18-90_030320	3/3/20	1330	AW	GW	2		2							X	
11	UNK-15_030320	3/3/20	1420	AW	GW	2		2							X	
12	EB-01_030320	3/3/20	1435	AW	GW	2		2							X	

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other Standard

Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [x] EDD'S

Comments / Remarks

- Report MDEQ 24 Compounds

INITIAL ASESSMENT SP

LABEL VERIFICATION TM

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
Austin Westhuis / Arcadis	3/2/20 1700	2 FedEx	3 FEDEX	3/4/20 900	Tonya
Relinquished by/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
5		6	7		8

Lab Use Only: Cooler Temperature (s) Celsius (corrected): 2.0

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (1) Rev 031318

SGS Sample Receipt Summary

Job Number: FA73111 **Client:** ARCADIS OF MICHIGAN, LLC **Project:** RACER LANSING PLANT 3

Date / Time Received: 3/4/2020 9:00:00 AM **Delivery Method:** FED EX **Airbill #'s:**

Therm ID: IR 1; **Therm CF:** -0.8; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (2.8);

Cooler Temps (Corrected) °C: Cooler 1: (2.0);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☑	☐
2. Trip Blank listed on COC	☐		☑	☐

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: TRINITYM Date: 3/4/2020 9:00:00 AM Reviewer: _____ Date: _____

FA73111: Chain of Custody
Page 2 of 2

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA73156

Sampling Dates: 03/03/20 - 03/04/20

Report to:

Arcadis

daniel.stockard@arcadis.com

ATTN: Daniel Stockard

Total number of pages in report: 29

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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EHS.US.CustomerCare@sgs.com

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Sample Summary

Arcadis

Job No: FA73156

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
FA73156-1	03/03/20	16:25	AW	03/05/20	AQ	Ground Water	MW-12-12_030320
FA73156-2	03/04/20	08:50	AW	03/05/20	AQ	Ground Water	MW-14-70_030420
FA73156-3	03/04/20	10:00	AW	03/05/20	AQ	Ground Water	MW-12-13_030420
FA73156-4	03/04/20	11:05	AW	03/05/20	AQ	Ground Water	MW-14-67_030420
FA73156-5	03/04/20	12:05	AW	03/05/20	AQ	Ground Water	MW-13-36R_030420
FA73156-6	03/04/20	13:50	AW	03/05/20	AQ	Ground Water	P6-SB-07_030420
FA73156-7	03/04/20	00:00	AW	03/05/20	AQ	Ground Water	DUP-05_030420
FA73156-8	03/04/20	14:55	AW	03/05/20	AQ	Ground Water	MW-18-104_030420
FA73156-9	03/04/20	16:55	AW	03/05/20	AQ	Ground Water	MW-91-2R_030420

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Summary of Hits

Job Number: FA73156
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 03/03/20 thru 03/04/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA73156-1	**MW-12-12_030320**					
Perfluorobutanoic acid		0.0418	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0790	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0951	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0458	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0697	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0077	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0085	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0014 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0011 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0406	0.0034	0.0013	ug/l	EPA 537M BY ID
FA73156-2	**MW-14-70_030420**					
Perfluorobutanoic acid		0.0506	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.155	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0981	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0632	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0372	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0048	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0031 J	0.0034	0.00086	ug/l	EPA 537M BY ID
FA73156-3	**MW-12-13_030420**					
Perfluorobutanoic acid		0.0322	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0439	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0556	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0144	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0011 J	0.0034	0.00086	ug/l	EPA 537M BY ID
FA73156-4	**MW-14-67_030420**					
Perfluorobutanoic acid		0.0491	0.0067	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0742	0.0033	0.0012	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0766	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0282	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0119	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0011 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0025 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0016 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0064	0.0033	0.0012	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA73156
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 03/03/20 thru 03/04/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA73156-5	**MW-13-36R_030420**					
Perfluorobutanoic acid		0.0259	0.0067	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0336	0.0033	0.0012	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0299	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0363	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0721	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0130	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0228	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluoroundecanoic acid		0.00084 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0445	0.0033	0.0012	ug/l	EPA 537M BY ID
MeFOSAA		0.0039 J	0.0067	0.0033	ug/l	EPA 537M BY ID
EtFOSAA		0.0066 J	0.0067	0.0033	ug/l	EPA 537M BY ID
FA73156-6	**P6-SB-07_030420**					
Perfluorobutanoic acid		0.220	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.966	0.034	0.013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.760	0.034	0.0086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.700	0.034	0.0086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.814	0.034	0.0086	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0869	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0271	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0021 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0011 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0030 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0549	0.0034	0.0013	ug/l	EPA 537M BY ID
FA73156-7	**DUP-05_030420**					
Perfluorobutanoic acid		0.208	0.0067	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.914	0.033	0.012	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.737	0.033	0.0083	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.666	0.033	0.0083	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.792	0.033	0.0083	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0859	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0265	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0021 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0027 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0565	0.0033	0.0012	ug/l	EPA 537M BY ID
FA73156-8	**MW-18-104_030420**					
Perfluorooctanoic acid		0.0014 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0016 J	0.0034	0.00086	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA73156
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 03/03/20 thru 03/04/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorohexanesulfonic acid		0.0016 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0065	0.0034	0.0013	ug/l	EPA 537M BY ID

FA73156-9 **MW-91-2R_030420**

No hits reported in this sample.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-12-12_030320		
Lab Sample ID:	FA73156-1	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45464.D	1	03/11/20 22:02	NAF	03/10/20 12:00	OP79327	S2Q683
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0418	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0790	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0951	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0458	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0697	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	0.0077	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	0.0085	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0034	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0034	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0406	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-12_030320		
Lab Sample ID:	FA73156-1	**Date Sampled:**	03/03/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%		35-135%
	13C5-PFPeA	68%		50-150%
	13C5-PFHxA	65%		50-150%
	13C4-PFHpA	63%		50-150%
	13C8-PFOA	71%		50-150%
	13C9-PFNA	74%		50-150%
	13C6-PFDA	72%		50-150%
	13C7-PFUnDA	85%		40-140%
	13C2-PFDoDA	90%		40-140%
	13C2-PFTeDA	86%		30-130%
	13C3-PFBS	75%		50-150%
	13C3-PFHxS	73%		50-150%
	13C8-PFOS	73%		50-150%
	13C8-FOSA	31%		30-130%
	d3-MeFOSAA	101%		50-150%
	13C2-4:2FTS	69%		50-150%
	13C2-6:2FTS	80%		50-150%
	13C2-8:2FTS	82%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-70_030420		
Lab Sample ID:	FA73156-2	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45465.D	1	03/11/20 22:17	NAF	03/10/20 12:00	OP79327	S2Q683
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0506	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.155	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0981	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0632	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0372	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0048	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0031	0.0034	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-70_030420		
Lab Sample ID:	FA73156-2	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	64%		35-135%
	13C5-PFPeA	65%		50-150%
	13C5-PFHxA	65%		50-150%
	13C4-PFHpA	66%		50-150%
	13C8-PFOA	77%		50-150%
	13C9-PFNA	80%		50-150%
	13C6-PFDA	87%		50-150%
	13C7-PFUnDA	92%		40-140%
	13C2-PFDoDA	89%		40-140%
	13C2-PFTeDA	85%		30-130%
	13C3-PFBS	73%		50-150%
	13C3-PFHxS	76%		50-150%
	13C8-PFOS	74%		50-150%
	13C8-FOSA	64%		30-130%
	d3-MeFOSAA	99%		50-150%
	13C2-4:2FTS	69%		50-150%
	13C2-6:2FTS	83%		50-150%
	13C2-8:2FTS	83%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-13_030420		
Lab Sample ID:	FA73156-3	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45467.D	1	03/11/20 22:48	NAF	03/10/20 12:00	OP79327	S2Q683
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0322	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0439	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0556	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0144	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0011	0.0034	0.00086	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-13_030420		
Lab Sample ID:	FA73156-3	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	81%		35-135%
	13C5-PFPeA	79%		50-150%
	13C5-PFHxA	78%		50-150%
	13C4-PFHpA	76%		50-150%
	13C8-PFOA	86%		50-150%
	13C9-PFNA	93%		50-150%
	13C6-PFDA	90%		50-150%
	13C7-PFUnDA	92%		40-140%
	13C2-PFDoDA	89%		40-140%
	13C2-PFTeDA	84%		30-130%
	13C3-PFBS	84%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	86%		50-150%
	13C8-FOSA	73%		30-130%
	d3-MeFOSAA	95%		50-150%
	13C2-4:2FTS	79%		50-150%
	13C2-6:2FTS	87%		50-150%
	13C2-8:2FTS	83%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-67_030420		
Lab Sample ID:	FA73156-4	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45468.D	1	03/11/20 23:03	NAF	03/10/20 12:00	OP79327	S2Q683
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0491	0.0067	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0742	0.0033	0.0012	ug/l	
307-24-4	Perfluorohexanoic acid	0.0766	0.0033	0.00083	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0282	0.0033	0.00083	ug/l	
335-67-1	Perfluorooctanoic acid	0.0119	0.0033	0.00083	ug/l	
375-95-1	Perfluorononanoic acid	0.0011	0.0033	0.00083	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0025	0.0033	0.00083	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0033	0.00083	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0033	0.0012	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0033	0.00083	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0016	0.0033	0.00083	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0033	0.00083	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0033	0.00083	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0033	0.00083	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0064	0.0033	0.0012	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0033	0.00083	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0067	0.0033	ug/l	
2991-50-6	EtFOSAA	ND	0.0067	0.0033	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-67_030420		
Lab Sample ID:	FA73156-4	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	53%		35-135%
	13C5-PFPeA	54%		50-150%
	13C5-PFHxA	53%		50-150%
	13C4-PFHpA	58%		50-150%
	13C8-PFOA	72%		50-150%
	13C9-PFNA	78%		50-150%
	13C6-PFDA	85%		50-150%
	13C7-PFUnDA	90%		40-140%
	13C2-PFDoDA	83%		40-140%
	13C2-PFTeDA	67%		30-130%
	13C3-PFBS	66%		50-150%
	13C3-PFHxS	73%		50-150%
	13C8-PFOS	71%		50-150%
	13C8-FOSA	41%		30-130%
	d3-MeFOSAA	97%		50-150%
	13C2-4:2FTS	57%		50-150%
	13C2-6:2FTS	79%		50-150%
	13C2-8:2FTS	83%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-13-36R_030420		
Lab Sample ID:	FA73156-5	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45469.D	1	03/11/20 23:19	NAF	03/10/20 12:00	OP79327	S2Q683
Run #2 [a]	2Q45516.D	5	03/12/20 11:21	NAF	03/10/20 12:00	OP79327	S2Q683

	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2	300 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0259	0.0067	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0336	0.0033	0.0012	ug/l	
307-24-4	Perfluorohexanoic acid	0.0299	0.0033	0.00083	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0363	0.0033	0.00083	ug/l	
335-67-1	Perfluorooctanoic acid	0.0721	0.0033	0.00083	ug/l	
375-95-1	Perfluorononanoic acid	0.0130	0.0033	0.00083	ug/l	
335-76-2	Perfluorodecanoic acid	0.0228	0.0033	0.00083	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.00084	0.0033	0.00083	ug/l	J
307-55-1	Perfluorododecanoic acid	ND	0.0033	0.0012	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0033	0.00083	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0033	0.00083	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0033	0.00083	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0033	0.00083	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0033	0.00083	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0445	0.0033	0.0012	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0033	0.00083	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.017	0.0042	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	0.0039	0.0067	0.0033	ug/l	J
2991-50-6	EtFOSAA	0.0066	0.0067	0.0033	ug/l	J
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-13-36R_030420
Lab Sample ID: FA73156-5
Matrix: AQ - Ground Water
Method: EPA 537M BY ID EPA 537 MOD
Project: Racer Lansing PFAS Delineation; Lansing, MI

Date Sampled: 03/04/20
Date Received: 03/05/20
Percent Solids: n/a

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	71%	90%	35-135%
	13C5-PFPeA	69%	84%	50-150%
	13C5-PFHxA	65%	82%	50-150%
	13C4-PFHpA	65%	76%	50-150%
	13C8-PFOA	73%	81%	50-150%
	13C9-PFNA	73%	78%	50-150%
	13C6-PFDA	71%	75%	50-150%
	13C7-PFUnDA	72%	76%	40-140%
	13C2-PFDoDA	72%	68%	40-140%
	13C2-PFTeDA	82%	44%	30-130%
	13C3-PFBS	79%	91%	50-150%
	13C3-PFHxS	79%	84%	50-150%
	13C8-PFOS	75%	77%	50-150%
	13C8-FOSA	24% [c]	49%	30-130%
	d3-MeFOSAA	69%	77%	50-150%
	13C2-4:2FTS	69%	82%	50-150%
	13C2-6:2FTS	83%	86%	50-150%
	13C2-8:2FTS	84%	81%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-SB-07_030420		
Lab Sample ID:	FA73156-6	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45470.D	1	03/11/20 23:34	NAF	03/10/20 12:00	OP79327	S2Q683
Run #2	2Q45517.D	10	03/12/20 11:36	NAF	03/10/20 12:00	OP79327	S2Q683

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2	290 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.220	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.966 [a]	0.034	0.013	ug/l	
307-24-4	Perfluorohexanoic acid	0.760 [a]	0.034	0.0086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.700 [a]	0.034	0.0086	ug/l	
335-67-1	Perfluorooctanoic acid	0.814 [a]	0.034	0.0086	ug/l	
375-95-1	Perfluorononanoic acid	0.0869	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	0.0271	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0021	0.0034	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0011	0.0034	0.00086	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0030	0.0034	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0549	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-SB-07_030420		
Lab Sample ID:	FA73156-6	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	71%	93%	35-135%
	13C5-PFPeA	68%	87%	50-150%
	13C5-PFHxA	66%	87%	50-150%
	13C4-PFHpA	66%	81%	50-150%
	13C8-PFOA	71%	88%	50-150%
	13C9-PFNA	76%	89%	50-150%
	13C6-PFDA	77%	85%	50-150%
	13C7-PFUnDA	87%	88%	40-140%
	13C2-PFDoDA	84%	82%	40-140%
	13C2-PFTeDA	77%	76%	30-130%
	13C3-PFBS	79%	95%	50-150%
	13C3-PFHxS	77%	92%	50-150%
	13C8-PFOS	74%	88%	50-150%
	13C8-FOSA	36%	75%	30-130%
	d3-MeFOSAA	98%	95%	50-150%
	13C2-4:2FTS	72%	83%	50-150%
	13C2-6:2FTS	73%	85%	50-150%
	13C2-8:2FTS	80%	82%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-05_030420		
Lab Sample ID:	FA73156-7	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45473.D	1	03/12/20 00:20	NAF	03/10/20 12:00	OP79327	S2Q683
Run #2	2Q45518.D	10	03/12/20 11:51	NAF	03/10/20 12:00	OP79327	S2Q683

	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2	300 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.208	0.0067	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.914 [a]	0.033	0.012	ug/l	
307-24-4	Perfluorohexanoic acid	0.737 [a]	0.033	0.0083	ug/l	
375-85-9	Perfluoroheptanoic acid	0.666 [a]	0.033	0.0083	ug/l	
335-67-1	Perfluorooctanoic acid	0.792 [a]	0.033	0.0083	ug/l	
375-95-1	Perfluorononanoic acid	0.0859	0.0033	0.00083	ug/l	
335-76-2	Perfluorodecanoic acid	0.0265	0.0033	0.00083	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0033	0.00083	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0033	0.0012	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0033	0.00083	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0021	0.0033	0.00083	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0033	0.00083	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0027	0.0033	0.00083	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0033	0.00083	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0565	0.0033	0.0012	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0033	0.00083	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0067	0.0033	ug/l	
2991-50-6	EtFOSAA	ND	0.0067	0.0033	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-05_030420		
Lab Sample ID:	FA73156-7	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	73%	95%	35-135%
	13C5-PFPeA	70%	89%	50-150%
	13C5-PFHxA	68%	87%	50-150%
	13C4-PFHpA	67%	84%	50-150%
	13C8-PFOA	72%	89%	50-150%
	13C9-PFNA	77%	90%	50-150%
	13C6-PFDA	77%	86%	50-150%
	13C7-PFUnDA	89%	88%	40-140%
	13C2-PFDoDA	86%	84%	40-140%
	13C2-PFTeDA	77%	78%	30-130%
	13C3-PFBS	81%	95%	50-150%
	13C3-PFHxS	79%	92%	50-150%
	13C8-PFOS	75%	89%	50-150%
	13C8-FOSA	37%	77%	30-130%
	d3-MeFOSAA	99%	93%	50-150%
	13C2-4:2FTS	74%	85%	50-150%
	13C2-6:2FTS	76%	87%	50-150%
	13C2-8:2FTS	81%	81%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-104_030420		
Lab Sample ID:	FA73156-8	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45474.D	1	03/12/20 00:35	NAF	03/10/20 12:00	OP79327	S2Q683
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0014	0.0034	0.00086	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0016	0.0034	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0016	0.0034	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0065	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-104_030420		
Lab Sample ID:	FA73156-8	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	81%		50-150%
	13C5-PFHxA	84%		50-150%
	13C4-PFHpA	80%		50-150%
	13C8-PFOA	92%		50-150%
	13C9-PFNA	90%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	86%		40-140%
	13C2-PFDoDA	80%		40-140%
	13C2-PFTeDA	75%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	88%		50-150%
	13C8-PFOS	86%		50-150%
	13C8-FOSA	70%		30-130%
	d3-MeFOSAA	88%		50-150%
	13C2-4:2FTS	81%		50-150%
	13C2-6:2FTS	85%		50-150%
	13C2-8:2FTS	79%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-91-2R_030420		
Lab Sample ID:	FA73156-9	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q45475.D	1	03/12/20 00:51	NAF	03/10/20 12:00	OP79327	S2Q683
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0067	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0033	0.0012	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0033	0.00083	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0033	0.00083	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0033	0.00083	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0033	0.00083	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0033	0.00083	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0033	0.00083	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0033	0.0012	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0033	0.00083	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0033	0.00083	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0033	0.00083	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0033	0.00083	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0033	0.00083	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0033	0.0012	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0033	0.00083	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0067	0.0033	ug/l	
2991-50-6	EtFOSAA	ND	0.0067	0.0033	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-91-2R_030420		
Lab Sample ID:	FA73156-9	**Date Sampled:**	03/04/20
Matrix:	AQ - Ground Water	**Date Received:**	03/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	87%		35-135%
	13C5-PFPeA	85%		50-150%
	13C5-PFHxA	87%		50-150%
	13C4-PFHpA	82%		50-150%
	13C8-PFOA	95%		50-150%
	13C9-PFNA	92%		50-150%
	13C6-PFDA	87%		50-150%
	13C7-PFUnDA	91%		40-140%
	13C2-PFDoDA	87%		40-140%
	13C2-PFTeDA	81%		30-130%
	13C3-PFBS	91%		50-150%
	13C3-PFHxS	89%		50-150%
	13C8-PFOS	89%		50-150%
	13C8-FOSA	84%		30-130%
	d3-MeFOSAA	92%		50-150%
	13C2-4:2FTS	82%		50-150%
	13C2-6:2FTS	89%		50-150%
	13C2-8:2FTS	79%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA73156
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

FA73156

SGS - ORLANDO JOB # :

PAGE 1 OF 1

Plant 6

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis of Michigan, LLC
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Michael.Spacil@arcadis.com Email:
Phone #: 313-407-8332
Sampler(s) Name(s) (Printed) Sampler 1: Austin Westhuis Sampler 2:

Project Information

Project Name: RACER Lansing Plant 6
Street: 2801 W. Saginaw St.
City: Lansing State: MI
Project #: 30042872.03T00
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via Method 537 mod. with isotope dilution per QSM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NAOH+ZNA	DI WATER	MEOH	LAB USE ONLY
1	MW-12-12_030320	3/3/20	1625	AW	GW	2		2								
2	MW-14-70_030420	3/4/20	0850	AW	GW	2		2								
3	MW-12-13_030420	3/4/20	1000	AW	GW	2		2								
4	MW-14-67_030420	3/4/20	1105	AW	GW	2		2								
5	MW-13-36R_030420	3/4/20	1205	AW	GW	2		2								
6	PW-SB-07_030420	3/4/20	1350	AW	GW	2		2								
7	Dup-05_030420	3/4/20	—	AW	GW	2		2								
8 *	MW-18-104_030420	3/4/20	1455	AW	GW	2		2								
~~*~~	~~MW-19-113_030420~~	~~3/4/20~~		~~AW~~	~~GW~~	~~2~~		~~2~~								
9 *	MW-91-2R_030420	3/4/20	1655	AW	GW	2		2								

AW 3/4/20

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other Standard

Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [X] EDD'S

LABEL VERIFICATION
INITIAL ASSESSMENT

Comments / Remarks

- Report MDEQ 24 compounds
- No sample for MW-19-113, well dry.

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1 Arcadis	3/4/20 1815	2 FedEx	3 FX		4 [illegible] 3/5/20 930
5		6	7		8

INITIAL ASESSMENT TM

Lab Use Only : Cooler Temperature (s) Celsius (corrected):

LABEL VERIFICATION SR

1.7

* MW-18-104 ~~and MW-19-113~~ *

2 MW-91-2R are Plant 3 wells

SGS Sample Receipt Summary

Job Number: FA73156 **Client:** ARCADIS OF MICHIGAN LLC **Project:** RACER LANSING PLANT 6

Date / Time Received: 3/5/2020 9:30:00 AM **Delivery Method:** FX **Airbill #'s:**

Therm ID: IR 1; **Therm CF:** -0.8; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (2.5);

Cooler Temps (Corrected) °C: Cooler 1: (1.7);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: PETERH Date: 3/5/2020 9:30:00 AM Reviewer: _____ Date: _____

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-131443-1
Client Project/Site: Racer Lansing
Revision: 1

For:
ARCADIS U.S., Inc.
10559 Citation Drive
Suite 100
Brighton, Michigan 48116

Attn: Amber Dmytro

Authorized for release by:
7/6/2020 2:09:54 PM

Michael DelMonico, Project Manager I
(330)497-9396
michael.delmonico@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Job ID: 240-131443-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Racer Lansing

Report Number: 240-131443-1

Revision

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Report revised on 7/6/2020 to correct sample IDs.

Eurofins TestAmerica, Burlington attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 6/5/2020 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.8º C.

1,4-DIOXANE

Samples MW-19-119D_060320 (240-131443-1), MW-19-119S_060320 (240-131443-2), MW-91-5_060320 (240-131443-3), MW-13-28_060320 (240-131443-4), MW-13-37_060320 (240-131443-5), EB-06_060320 (240-131443-6), DUP-09_060320 (240-131443-7), MW-13-38_060420 (240-131443-8), MW-91-6_060420 (240-131443-9) and MW-13-47_060420 (240-131443-10) were analyzed for 1,4-Dioxane in accordance with EPA Method 522. The samples were prepared on 06/10/2020 and analyzed on 06/12/2020.

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

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-131443-1	MW-19-119D_060320	Water	06/03/20 12:25	06/05/20 09:40	
240-131443-2	MW-19-119S_060320	Water	06/03/20 13:40	06/05/20 09:40	
240-131443-3	MW-91-5_060320	Water	06/03/20 14:45	06/05/20 09:40	
240-131443-4	MW-13-28_060320	Water	06/03/20 15:50	06/05/20 09:40	
240-131443-5	MW-13-37_060320	Water	06/03/20 17:15	06/05/20 09:40	
240-131443-6	EB-06_060320	Water	06/03/20 17:40	06/05/20 09:40	
240-131443-7	DUP-09_060320	Water	06/03/20 00:00	06/05/20 09:40	
240-131443-8	MW-13-38_060420	Water	06/04/20 09:00	06/05/20 09:40	
240-131443-9	MW-91-6_060420	Water	06/04/20 10:25	06/05/20 09:40	
240-131443-10	MW-13-47_060420	Water	06/04/20 11:25	06/05/20 09:40	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: MW-19-119D_060320 — Lab Sample ID: 240-131443-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.89		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: MW-19-119S_060320 — Lab Sample ID: 240-131443-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.41		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: MW-91-5_060320 — Lab Sample ID: 240-131443-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.14	J	0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: MW-13-28_060320 — Lab Sample ID: 240-131443-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.78		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: MW-13-37_060320 — Lab Sample ID: 240-131443-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.32		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: EB-06_060320 — Lab Sample ID: 240-131443-6

No Detections.

Client Sample ID: DUP-09_060320 — Lab Sample ID: 240-131443-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.44		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: MW-13-38_060420 — Lab Sample ID: 240-131443-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.0		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: MW-91-6_060420 — Lab Sample ID: 240-131443-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.40		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: MW-13-47_060420 — Lab Sample ID: 240-131443-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.98		0.20	0.073	ug/L	1		522	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: MW-19-119D_060320
Date Collected: 06/03/20 12:25
Date Received: 06/05/20 09:40

Lab Sample ID: 240-131443-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.89		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 15:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*103*		*46 - 130*	*06/10/20 18:00*	*06/12/20 15:13*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: MW-19-119S_060320
Date Collected: 06/03/20 13:40
Date Received: 06/05/20 09:40

Lab Sample ID: 240-131443-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.41		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 15:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*95*		*46 - 130*	*06/10/20 18:00*	*06/12/20 15:26*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: MW-91-5_060320
Date Collected: 06/03/20 14:45
Date Received: 06/05/20 09:40

Lab Sample ID: 240-131443-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.14	J	0.20	0.073	ug/L		06/10/20 18:00	06/12/20 15:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*88*		*46 - 130*	*06/10/20 18:00*	*06/12/20 15:39*	*1*

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: MW-13-28_060320
Date Collected: 06/03/20 15:50
Date Received: 06/05/20 09:40

Lab Sample ID: 240-131443-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.78		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 15:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*88*		*46 - 130*	*06/10/20 18:00*	*06/12/20 15:53*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: MW-13-37_060320
Date Collected: 06/03/20 17:15
Date Received: 06/05/20 09:40

Lab Sample ID: 240-131443-5
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.32		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 16:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*99*		*46 - 130*	*06/10/20 18:00*	*06/12/20 16:06*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: EB-06_060320
Date Collected: 06/03/20 17:40
Date Received: 06/05/20 09:40

Lab Sample ID: 240-131443-6
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		06/10/20 18:00	06/12/20 16:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*97*		*46 - 130*	*06/10/20 18:00*	*06/12/20 16:20*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: DUP-09_060320
Date Collected: 06/03/20 00:00
Date Received: 06/05/20 09:40

Lab Sample ID: 240-131443-7
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.44		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 16:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*103*		*46 - 130*	*06/10/20 18:00*	*06/12/20 16:33*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: MW-13-38_060420
Date Collected: 06/04/20 09:00
Date Received: 06/05/20 09:40

Lab Sample ID: 240-131443-8
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 16:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*91*		*46 - 130*	*06/10/20 18:00*	*06/12/20 16:47*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: MW-91-6_060420
Date Collected: 06/04/20 10:25
Date Received: 06/05/20 09:40

Lab Sample ID: 240-131443-9
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 17:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*94*		*46 - 130*	*06/10/20 18:00*	*06/12/20 17:00*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: MW-13-47_060420
Date Collected: 06/04/20 11:25
Date Received: 06/05/20 09:40

Lab Sample ID: 240-131443-10
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.98		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*95*		*46 - 130*	*06/10/20 18:00*	*06/12/20 17:14*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)								
Lab Sample ID	Client Sample ID	DXE (46-130)								
240-131443-1	MW-19-119D_060320	103								
240-131443-2	MW-19-119S_060320	95								
240-131443-3	MW-91-5_060320	88								
240-131443-4	MW-13-28_060320	88								
240-131443-5	MW-13-37_060320	99								
240-131443-6	EB-06_060320	97								
240-131443-7	DUP-09_060320	103								
240-131443-8	MW-13-38_060420	91								
240-131443-9	MW-91-6_060420	94								
240-131443-10	MW-13-47_060420	95								
240-131443-10 MS	MW-13-47_060420	86								
240-131443-10 MSD	MW-13-47_060420	91								
LCS 200-155690/2-A	Lab Control Sample	111								
MB 200-155690/1-A	Method Blank	110								

Surrogate Legend

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

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

Lab Sample ID: MB 200-155690/1-A
Matrix: Water
Analysis Batch: 155770

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 155690

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		06/10/20 18:00	06/12/20 12:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*110*		*46 - 130*	*06/10/20 18:00*	*06/12/20 12:31*	*1*

Lab Sample ID: LCS 200-155690/2-A
Matrix: Water
Analysis Batch: 155770

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 155690

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			8.00	8.82		ug/L		110	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*111*		*46 - 130*

Lab Sample ID: 240-131443-10 MS
Matrix: Water
Analysis Batch: 155770

Client Sample ID: MW-13-47_060420
Prep Type: Total/NA
Prep Batch: 155690

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	0.98		2.00	2.74		ug/L		88	70 - 130		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*86*		*46 - 130*

Lab Sample ID: 240-131443-10 MSD
Matrix: Water
Analysis Batch: 155770

Client Sample ID: MW-13-47_060420
Prep Type: Total/NA
Prep Batch: 155690

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	0.98		2.00	2.92		ug/L		97	70 - 130	6	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*91*		*46 - 130*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

GC/MS Semi VOA

Prep Batch: 155690

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-131443-1	MW-19-119D_060320	Total/NA	Water	522	
240-131443-2	MW-19-119S_060320	Total/NA	Water	522	
240-131443-3	MW-91-5_060320	Total/NA	Water	522	
240-131443-4	MW-13-28_060320	Total/NA	Water	522	
240-131443-5	MW-13-37_060320	Total/NA	Water	522	
240-131443-6	EB-06_060320	Total/NA	Water	522	
240-131443-7	DUP-09_060320	Total/NA	Water	522	
240-131443-8	MW-13-38_060420	Total/NA	Water	522	
240-131443-9	MW-91-6_060420	Total/NA	Water	522	
240-131443-10	MW-13-47_060420	Total/NA	Water	522	
MB 200-155690/1-A	Method Blank	Total/NA	Water	522	
LCS 200-155690/2-A	Lab Control Sample	Total/NA	Water	522	
240-131443-10 MS	MW-13-47_060420	Total/NA	Water	522	
240-131443-10 MSD	MW-13-47_060420	Total/NA	Water	522	

Analysis Batch: 155770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-131443-1	MW-19-119D_060320	Total/NA	Water	522	155690
240-131443-2	MW-19-119S_060320	Total/NA	Water	522	155690
240-131443-3	MW-91-5_060320	Total/NA	Water	522	155690
240-131443-4	MW-13-28_060320	Total/NA	Water	522	155690
240-131443-5	MW-13-37_060320	Total/NA	Water	522	155690
240-131443-6	EB-06_060320	Total/NA	Water	522	155690
240-131443-7	DUP-09_060320	Total/NA	Water	522	155690
240-131443-8	MW-13-38_060420	Total/NA	Water	522	155690
240-131443-9	MW-91-6_060420	Total/NA	Water	522	155690
240-131443-10	MW-13-47_060420	Total/NA	Water	522	155690
MB 200-155690/1-A	Method Blank	Total/NA	Water	522	155690
LCS 200-155690/2-A	Lab Control Sample	Total/NA	Water	522	155690
240-131443-10 MS	MW-13-47_060420	Total/NA	Water	522	155690
240-131443-10 MSD	MW-13-47_060420	Total/NA	Water	522	155690

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: MW-19-119D_060320
Lab Sample ID: 240-131443-1
Date Collected: 06/03/20 12:25
Matrix: Water
Date Received: 06/05/20 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 15:13	K1P	TAL BUR

Client Sample ID: MW-19-119S_060320
Lab Sample ID: 240-131443-2
Date Collected: 06/03/20 13:40
Matrix: Water
Date Received: 06/05/20 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 15:26	K1P	TAL BUR

Client Sample ID: MW-91-5_060320
Lab Sample ID: 240-131443-3
Date Collected: 06/03/20 14:45
Matrix: Water
Date Received: 06/05/20 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 15:39	K1P	TAL BUR

Client Sample ID: MW-13-28_060320
Lab Sample ID: 240-131443-4
Date Collected: 06/03/20 15:50
Matrix: Water
Date Received: 06/05/20 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 15:53	K1P	TAL BUR

Client Sample ID: MW-13-37_060320
Lab Sample ID: 240-131443-5
Date Collected: 06/03/20 17:15
Matrix: Water
Date Received: 06/05/20 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 16:06	K1P	TAL BUR

Client Sample ID: EB-06_060320
Lab Sample ID: 240-131443-6
Date Collected: 06/03/20 17:40
Matrix: Water
Date Received: 06/05/20 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 16:20	K1P	TAL BUR

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Client Sample ID: DUP-09_060320

Lab Sample ID: 240-131443-7

Date Collected: 06/03/20 00:00

Matrix: Water

Date Received: 06/05/20 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 16:33	K1P	TAL BUR

Client Sample ID: MW-13-38_060420

Lab Sample ID: 240-131443-8

Date Collected: 06/04/20 09:00

Matrix: Water

Date Received: 06/05/20 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 16:47	K1P	TAL BUR

Client Sample ID: MW-91-6_060420

Lab Sample ID: 240-131443-9

Date Collected: 06/04/20 10:25

Matrix: Water

Date Received: 06/05/20 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 17:00	K1P	TAL BUR

Client Sample ID: MW-13-47_060420

Lab Sample ID: 240-131443-10

Date Collected: 06/04/20 11:25

Matrix: Water

Date Received: 06/05/20 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 17:14	K1P	TAL BUR

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131443-1

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-20
Minnesota	NELAP	OH00048	12-31-20
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-21
West Virginia DEP	State	210	12-31-20

Laboratory: Eurofins TestAmerica, Burlington

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2336	02-25-23
Connecticut	State	PH-0751	09-30-21
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	05-16-21
Florida	NELAP	E87467	06-30-20
Minnesota	NELAP	050-999-436	12-31-20
New Hampshire	NELAP	2006	12-18-20
New Jersey	NELAP	VT972	06-30-20
New York	NELAP	10391	04-01-21
Pennsylvania	NELAP	68-00489	04-30-21
Rhode Island	State	LAO00298	12-30-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00272	08-09-20
Vermont	State	VT4000	12-31-20
Virginia	NELAP	460209	12-14-20
Wisconsin	State	399133350	08-31-20

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

0.9/1.8

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Bill Cosean	Lab PM: DelMonico, Michael	Carrier Tracking No(s):	COC No: 240-72037-29231.2
Client Contact: Alex Villhauer	Phone: 810-588-3642	E-Mail: michael.delmonico@testamericainc.com		Page: Page 1 of 1
Company: ARCADIS U.S., Inc.				Job #:
Address: 300 South Washington Square Suite 315	Due Date Requested:			
City: Lansing	TAT Requested (days):			
State, Zip: MI, 48933				
Phone:	PO #: Purchase Order not required			
Email: alex.villhauer@arcadis.com	WO #: Project #: B0064607.2016.00001			
Project Name: Racer Lansing method 522	Project #: 24017406			
Site:	SSOW#:			

Analysis Requested

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522 - 522-1,4-Dioxane	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A		
MW-19-1195_060320	6/3/20	12:25	G	Water	N	N	X		
MW-19-1195_060320	6/3/20	13:40	G	Water	N	N	X		
MW-91-5_060320 6-4-20	6/3/20	14:45	G	Water	N	N	X		MW-91-5_060320
MW-13-28_060320	6/3/20	15:50	G	Water	N	N	X		
MW-13-37_060320	6/3/20	17:15	G	Water	N	N	X		
EB-06_060320	6/3/20	17:40	G	Water	N	N	X		
Dup-09_060320	6/3/20	—	G	Water	N	N	X		
MW-13-38_060420	6/4/20	9:00	G	Water	N	N	X		
MW-91-6_060420	6/4/20	10:25	G	Water	N	N	X		
MW-13-47_060420	6/4/20	11:25	G	Water	N	Y	X		MS/MSD
				Water					

240-131443 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature] ARCADIS	6-4-20 13:00	ARCADIS	[signature]	6-5-20 940	EA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Adonna Carey

Cooler Received on 6-5-20 Opened on 6-6-20

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

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

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-10 (CF +0.7 °C) Observed Cooler Temp. 0.0 °C Corrected Cooler Temp. _____ °C
   IR GUN #IR-11 (CF +0.9°C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.8 °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels be reconciled with the COC?	Yes	No
9. Were correct bottle(s) used for the test(s) indicated?	Yes	No
10. Sufficient quantity received to perform indicated analyses?	Yes	No
11. Are these work share samples?	Yes	No
If yes, Questions 12-16 have been checked at the originating laboratory.		
12. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC902937
13. Were VOAs on the COC?	Yes	No
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
16. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

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

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

18. SAMPLE CONDITION

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

19. SAMPLE PRESERVATION

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

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-09

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: DelMonico, Michael	Carrier Tracking No(s):	COC No: 240-121571.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: michael.delmonico@testamericainc.com	State of Origin: Michigan	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-131443-1
Address: 30 Community Drive, Suite 11,	Due Date Requested: 6/18/2020			
City: South Burlington	TAT Requested (days):			
State, Zip: VT, 05403				
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:			
Email:	WO #:			
Project Name: Racer Lansing	Project #: 24017406			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522/522_CWA_Prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-19-1190_060320 (240-131443-1)	6/3/20	12:25 Eastern		Water			X	1	
MW-19-119S_060320 (240-131443-2)	6/3/20	13:40 Eastern		Water			X	1	
MW-9_060320 (240-131443-3)	6/3/20	14:45 Eastern		Water			X	1	
MW-13-28_060320 (240-131443-4)	6/3/20	15:50 Eastern		Water			X	1	
MW-13-37_060320 (240-131443-5)	6/3/20	17:15 Eastern		Water			X	1	
EB-06_060320 (240-131443-6)	6/3/20	17:40 Eastern		Water			X	1	
DUP-09_060320 (240-131443-7)	6/3/20	Eastern		Water			X	1	
MW-13-38_060420 (240-131443-8)	6/4/20	09:00 Eastern		Water			X	1	
MW-91-6_060420 (240-131443-9)	6/4/20	10:25 Eastern		Water			X	1	

240-131443 COC

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

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

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
		6-8-20 1230	240		6/9/2020 10:30	TAL SAC
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.0

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: DelMonico, Michael	Carrier Tracking No(s):	COC No: 240-121571.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: michael.delmonico@testamericainc.com	State of Origin: Michigan	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-131443-1
Address: 30 Community Drive, Suite 11,	Due Date Requested: 6/18/2020			
City: South Burlington	TAT Requested (days):			
State, Zip: VT, 05403				
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:			
Email:	WO #:			
Project Name: Racer Lansing	Project #: 24017406			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522/522_CWA_Prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-13-47_060420 (240-131443-10)	6/4/20	11:25 Eastern		Water			X	3	

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

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

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	6-8-20 1230	240			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 6/8/2020 10:30	Company TAB
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 5.0

Ver: 01/16/2019

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ORIGIN ID:PHDA (330) 312-0176
EUROFINS TESTAMERICA CANTON
4101 SHUFFEL STREET NW
NORTH CANTON, OH 447206900
UNITED STATES US

SHIP DATE: 08JUN20
ACTWGT: 40.70 LB
CAD: 0562057/CAFE3313
BILL RECIPIENT

TO ENVIRONMENTAL SAMPLE RECEIPT
TESTAMERICA BURLINGTON
30 COMMUNITY DRIVE
SOUTH BURLINGTON VT 05403
(802) 660-1990
DEPT: AL HAIDET

FedEx Express

TRK# 0201 1103 6129 3842

TUE - 09 JUN 10:30
PRIORITY OVERNIGH

NL BTVA

05403
VT-US BTV

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 240-131443-1

Login Number: 131443
List Number: 2
Creator: Lavigne, Scott M

List Source: Eurofins TestAmerica, Burlington
List Creation: 06/09/20 01:15 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.0ºC
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-131478-1
Client Project/Site: Racer Lansing
Revision: 1

For:
ARCADIS U.S., Inc.
10559 Citation Drive
Suite 100
Brighton, Michigan 48116

Attn: Amber Dmytro

Authorized for release by:
7/6/2020 2:14:21 PM

Michael DelMonico, Project Manager I
(330)497-9396
michael.delmonico@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Job ID: 240-131478-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Racer Lansing

Report Number: 240-131478-1

Revision

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Report revised on 7/6/2020 to correct sample IDs.

Eurofins TestAmerica, Burlington attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 6/6/2020 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4° C.

1,4-DIOXANE

Samples FB-05_060420 (240-131478-1), MW-12-02_060420 (240-131478-2), MW-19-125_060420 (240-131478-3), MW-12-06_060420 (240-131478-4), MW-13-44_060420 (240-131478-5), MW-12-01_060520 (240-131478-6), MW-12-05R_060520 (240-131478-7), MW-17-87_060520 (240-131478-8), MW-19-118D_060520 (240-131478-9), MW-19-118S_060520 (240-131478-10) and DUP-05_060520 (240-131478-11) were analyzed for 1,4-Dioxane in accordance with EPA Method 522. The samples were prepared on 06/10/2020 and 06/12/2020 and analyzed on 06/12/2020 and 06/13/2020.

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

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-131478-1	FB-05_060420	Water	06/04/20 13:45	06/06/20 09:50	
240-131478-2	MW-12-02_060420	Water	06/04/20 14:50	06/06/20 09:50	
240-131478-3	MW-19-125_060420	Water	06/04/20 16:10	06/06/20 09:50	
240-131478-4	MW-12-06_060420	Water	06/04/20 17:35	06/06/20 09:50	
240-131478-5	MW-13-44_060420	Water	06/04/20 18:50	06/06/20 09:50	
240-131478-6	MW-12-01_060520	Water	06/05/20 09:05	06/06/20 09:50	
240-131478-7	MW-12-05R_060520	Water	06/05/20 10:20	06/06/20 09:50	
240-131478-8	MW-17-87_060520	Water	06/05/20 11:45	06/06/20 09:50	
240-131478-9	MW-19-118D_060520	Water	06/05/20 12:50	06/06/20 09:50	
240-131478-10	MW-19-118S_060520	Water	06/05/20 13:40	06/06/20 09:50	
240-131478-11	DUP-05_060520	Water	06/05/20 00:00	06/06/20 09:50	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: FB-05_060420 — Lab Sample ID: 240-131478-1

No Detections.

Client Sample ID: MW-12-02_060420 — Lab Sample ID: 240-131478-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.65		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: MW-19-125_060420 — Lab Sample ID: 240-131478-3

No Detections.

Client Sample ID: MW-12-06_060420 — Lab Sample ID: 240-131478-4

No Detections.

Client Sample ID: MW-13-44_060420 — Lab Sample ID: 240-131478-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.79		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: MW-12-01_060520 — Lab Sample ID: 240-131478-6

No Detections.

Client Sample ID: MW-12-05R_060520 — Lab Sample ID: 240-131478-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.16	J	0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: MW-17-87_060520 — Lab Sample ID: 240-131478-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.5		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: MW-19-118D_060520 — Lab Sample ID: 240-131478-9

No Detections.

Client Sample ID: MW-19-118S_060520 — Lab Sample ID: 240-131478-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.99		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: DUP-05_060520 — Lab Sample ID: 240-131478-11

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: FB-05_060420
Date Collected: 06/04/20 13:45
Date Received: 06/06/20 09:50

Lab Sample ID: 240-131478-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		06/10/20 18:00	06/12/20 12:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*108*		*46 - 130*	*06/10/20 18:00*	*06/12/20 12:45*	*1*

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: MW-12-02_060420
Date Collected: 06/04/20 14:50
Date Received: 06/06/20 09:50

Lab Sample ID: 240-131478-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.65		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 12:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*99*		*46 - 130*	*06/10/20 18:00*	*06/12/20 12:58*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: MW-19-125_060420
Date Collected: 06/04/20 16:10
Date Received: 06/06/20 09:50

Lab Sample ID: 240-131478-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		06/10/20 18:00	06/12/20 13:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*100*		*46 - 130*	*06/10/20 18:00*	*06/12/20 13:12*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: MW-12-06_060420
Date Collected: 06/04/20 17:35
Date Received: 06/06/20 09:50

Lab Sample ID: 240-131478-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		06/10/20 18:00	06/12/20 13:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*107*		*46 - 130*	*06/10/20 18:00*	*06/12/20 13:25*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: MW-13-44_060420
Date Collected: 06/04/20 18:50
Date Received: 06/06/20 09:50

Lab Sample ID: 240-131478-5
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.79		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 13:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*100*		*46 - 130*	*06/10/20 18:00*	*06/12/20 13:38*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: MW-12-01_060520
Date Collected: 06/05/20 09:05
Date Received: 06/06/20 09:50

Lab Sample ID: 240-131478-6
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		06/10/20 18:00	06/12/20 13:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*105*		*46 - 130*	*06/10/20 18:00*	*06/12/20 13:52*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: MW-12-05R_060520
Date Collected: 06/05/20 10:20
Date Received: 06/06/20 09:50

Lab Sample ID: 240-131478-7
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.16	J	0.20	0.073	ug/L		06/10/20 18:00	06/12/20 14:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*109*		*46 - 130*	*06/10/20 18:00*	*06/12/20 14:05*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: MW-17-87_060520
Date Collected: 06/05/20 11:45
Date Received: 06/06/20 09:50

Lab Sample ID: 240-131478-8
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	1.5		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 14:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*108*		*46 - 130*	*06/10/20 18:00*	*06/12/20 14:19*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: MW-19-118D_060520
Date Collected: 06/05/20 12:50
Date Received: 06/06/20 09:50

Lab Sample ID: 240-131478-9
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		06/10/20 18:00	06/12/20 14:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*107*		*46 - 130*	*06/10/20 18:00*	*06/12/20 14:32*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: MW-19-118S_060520
Date Collected: 06/05/20 13:40
Date Received: 06/06/20 09:50

Lab Sample ID: 240-131478-10
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.99		0.20	0.073	ug/L		06/10/20 18:00	06/12/20 14:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*105*		*46 - 130*	*06/10/20 18:00*	*06/12/20 14:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: DUP-05_060520
Date Collected: 06/05/20 00:00
Date Received: 06/06/20 09:50

Lab Sample ID: 240-131478-11
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		06/12/20 13:30	06/13/20 01:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*113*		*46 - 130*	*06/12/20 13:30*	*06/13/20 01:57*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DXE (46-130)
240-131478-1	FB-05_060420	108
240-131478-2	MW-12-02_060420	99
240-131478-3	MW-19-125_060420	100
240-131478-4	MW-12-06_060420	107
240-131478-5	MW-13-44_060420	100
240-131478-6	MW-12-01_060520	105
240-131478-7	MW-12-05R_060520	109
240-131478-8	MW-17-87_060520	108
240-131478-9	MW-19-118D_060520	107
240-131478-10	MW-19-118S_060520	105
240-131478-11	DUP-05_060520	113
LCS 200-155690/2-A	Lab Control Sample	111
LCS 200-155773/2-A	Lab Control Sample	117
MB 200-155690/1-A	Method Blank	110
MB 200-155773/1-A	Method Blank	120

Surrogate Legend

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

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

Lab Sample ID: MB 200-155690/1-A
Matrix: Water
Analysis Batch: 155770

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 155690

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		06/10/20 18:00	06/12/20 12:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*110*		*46 - 130*	*06/10/20 18:00*	*06/12/20 12:31*	*1*

Lab Sample ID: LCS 200-155690/2-A
Matrix: Water
Analysis Batch: 155770

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 155690

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			8.00	8.82		ug/L		110	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*111*		*46 - 130*

Lab Sample ID: MB 200-155773/1-A
Matrix: Water
Analysis Batch: 155770

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 155773

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		06/12/20 13:30	06/12/20 23:56	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*120*		*46 - 130*	*06/12/20 13:30*	*06/12/20 23:56*	*1*

Lab Sample ID: LCS 200-155773/2-A
Matrix: Water
Analysis Batch: 155770

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 155773

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			2.00	2.37		ug/L		119	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*117*		*46 - 130*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

GC/MS Semi VOA

Prep Batch: 155690

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-131478-1	FB-05_060420	Total/NA	Water	522	
240-131478-2	MW-12-02_060420	Total/NA	Water	522	
240-131478-3	MW-19-125_060420	Total/NA	Water	522	
240-131478-4	MW-12-06_060420	Total/NA	Water	522	
240-131478-5	MW-13-44_060420	Total/NA	Water	522	
240-131478-6	MW-12-01_060520	Total/NA	Water	522	
240-131478-7	MW-12-05R_060520	Total/NA	Water	522	
240-131478-8	MW-17-87_060520	Total/NA	Water	522	
240-131478-9	MW-19-118D_060520	Total/NA	Water	522	
240-131478-10	MW-19-118S_060520	Total/NA	Water	522	
MB 200-155690/1-A	Method Blank	Total/NA	Water	522	
LCS 200-155690/2-A	Lab Control Sample	Total/NA	Water	522	

Analysis Batch: 155770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-131478-1	FB-05_060420	Total/NA	Water	522	155690
240-131478-2	MW-12-02_060420	Total/NA	Water	522	155690
240-131478-3	MW-19-125_060420	Total/NA	Water	522	155690
240-131478-4	MW-12-06_060420	Total/NA	Water	522	155690
240-131478-5	MW-13-44_060420	Total/NA	Water	522	155690
240-131478-6	MW-12-01_060520	Total/NA	Water	522	155690
240-131478-7	MW-12-05R_060520	Total/NA	Water	522	155690
240-131478-8	MW-17-87_060520	Total/NA	Water	522	155690
240-131478-9	MW-19-118D_060520	Total/NA	Water	522	155690
240-131478-10	MW-19-118S_060520	Total/NA	Water	522	155690
240-131478-11	DUP-05_060520	Total/NA	Water	522	155773
MB 200-155690/1-A	Method Blank	Total/NA	Water	522	155690
MB 200-155773/1-A	Method Blank	Total/NA	Water	522	155773
LCS 200-155690/2-A	Lab Control Sample	Total/NA	Water	522	155690
LCS 200-155773/2-A	Lab Control Sample	Total/NA	Water	522	155773

Prep Batch: 155773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-131478-11	DUP-05_060520	Total/NA	Water	522	
MB 200-155773/1-A	Method Blank	Total/NA	Water	522	
LCS 200-155773/2-A	Lab Control Sample	Total/NA	Water	522	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: FB-05_060420
Lab Sample ID: 240-131478-1
Date Collected: 06/04/20 13:45
Matrix: Water
Date Received: 06/06/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 12:45	K1P	TAL BUR

Client Sample ID: MW-12-02_060420
Lab Sample ID: 240-131478-2
Date Collected: 06/04/20 14:50
Matrix: Water
Date Received: 06/06/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 12:58	K1P	TAL BUR

Client Sample ID: MW-19-125_060420
Lab Sample ID: 240-131478-3
Date Collected: 06/04/20 16:10
Matrix: Water
Date Received: 06/06/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 13:12	K1P	TAL BUR

Client Sample ID: MW-12-06_060420
Lab Sample ID: 240-131478-4
Date Collected: 06/04/20 17:35
Matrix: Water
Date Received: 06/06/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 13:25	K1P	TAL BUR

Client Sample ID: MW-13-44_060420
Lab Sample ID: 240-131478-5
Date Collected: 06/04/20 18:50
Matrix: Water
Date Received: 06/06/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 13:38	K1P	TAL BUR

Client Sample ID: MW-12-01_060520
Lab Sample ID: 240-131478-6
Date Collected: 06/05/20 09:05
Matrix: Water
Date Received: 06/06/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 13:52	K1P	TAL BUR

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Client Sample ID: MW-12-05R_060520

Lab Sample ID: 240-131478-7
Matrix: Water
Date Collected: 06/05/20 10:20
Date Received: 06/06/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 14:05	K1P	TAL BUR

Client Sample ID: MW-17-87_060520

Lab Sample ID: 240-131478-8
Matrix: Water
Date Collected: 06/05/20 11:45
Date Received: 06/06/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 14:19	K1P	TAL BUR

Client Sample ID: MW-19-118D_060520

Lab Sample ID: 240-131478-9
Matrix: Water
Date Collected: 06/05/20 12:50
Date Received: 06/06/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 14:32	K1P	TAL BUR

Client Sample ID: MW-19-118S_060520

Lab Sample ID: 240-131478-10
Matrix: Water
Date Collected: 06/05/20 13:40
Date Received: 06/06/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155690	06/10/20 18:00	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/12/20 14:46	K1P	TAL BUR

Client Sample ID: DUP-05_060520

Lab Sample ID: 240-131478-11
Matrix: Water
Date Collected: 06/05/20 00:00
Date Received: 06/06/20 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			155773	06/12/20 13:30	EK	TAL BUR
Total/NA	Analysis	522		1	155770	06/13/20 01:57	K1P	TAL BUR

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 240-131478-1

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-20
Minnesota	NELAP	OH00048	12-31-20
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-21
West Virginia DEP	State	210	12-31-20

Laboratory: Eurofins TestAmerica, Burlington

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2336	02-25-23
Connecticut	State	PH-0751	09-30-21
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	05-16-21
Florida	NELAP	E87467	06-30-20
Minnesota	NELAP	050-999-436	12-31-20
New Hampshire	NELAP	2006	12-18-20
New Jersey	NELAP	VT972	06-30-20
New York	NELAP	10391	04-01-21
Pennsylvania	NELAP	68-00489	04-30-21
Rhode Island	State	LAO00298	12-30-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00272	08-09-20
Vermont	State	VT4000	12-31-20
Virginia	NELAP	460209	12-14-20
Wisconsin	State	399133350	08-31-20

2.5/3-4

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Billy J. Cobean	Lab PM: DelMonico, Michael	Carrier Tracking No(s):	COC No: 240-72037-29231.1
Client Contact: Alex Villhauer	Phone: 810-588-3642	E-Mail: michael.delmonico@testamericainc.com		Page: Page 1 of 2
Company: ARCADIS U.S., Inc.				Job #:
Address: 300 South Washington Square Suite 315	Due Date Requested:			
City: Lansing	TAT Requested (days):			
State, Zip: MI, 48933				
Phone:	PO #: Purchase Order not required			
Email: alex.villhauer@arcadis.com	WO #: Project #: B0064607.2016.00001			
Project Name: Racer Lansing method 522	Project #: 24017406			
Site: PLANT-2	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522 - 522- 1,4-Dioxane	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A		
FB-05_060420	6/4/20	13:45	G	Water	N	N	X		
MW-12-02_060420	6/4/20	14:50	G	Water	N	N	X		
MW-19-125_060420	6/4/20	16:10	G	Water	N	N	X		
MW-12-06_060420	6/4/20	17:35	G	Water	N	N	X		
MW-13-44_060420	6/4/20	18:50	G	Water	N	N	X		
MW-12-01_060520	6/5/20	9:05	G	Water	N	N	X		
MW-12-05R_060520	6/5/20	10:20	G	Water	N	N	X		
MW-17-87_060520	6/5/20	11:45	G	Water	N	N	X		
MW-19-118D_060520	6/5/20	12:50	G	Water	N	N	X		
MW-19-118S_060520	6/5/20	13:40	G	Water	N	N	X		
Dup-05_060520	6/5/20	—	G	Water	N	N	X		

240-131478 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:				
Relinquished by:	Date/Time: 6-5-20 / 14:45	Company ARCADIS	Received by:	Date/Time: 6-6-20 950	Company ETA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 01/16/2019

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 151478

Client Arcadis Site Name

Cooler unpacked by: Adam Garvey

Cooler Received on 6-6-20 Opened on 6-6-20

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

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

TestAmerica Cooler # 14 Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-10 (CF +0.7 °C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

IR GUN #IR-11 (CF +0.9°C) Observed Cooler Temp. 2.5 °C Corrected Cooler Temp. 3.4 °C

2.	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes No
	-Were the seals on the outside of the cooler(s) signed & dated?	Yes No NA
	-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes No
	-Were tamper/custody seals intact and uncompromised?	Yes No NA
3.	Shippers' packing slip attached to the cooler(s)?	Yes No
4.	Did custody papers accompany the sample(s)?	Yes No
5.	Were the custody papers relinquished & signed in the appropriate place?	Yes No
6.	Was/were the person(s) who collected the samples clearly identified on the COC?	Yes No
7.	Did all bottles arrive in good condition (Unbroken)?	Yes No
8.	Could all bottle labels be reconciled with the COC?	Yes No
9.	Were correct bottle(s) used for the test(s) indicated?	Yes No
10.	Sufficient quantity received to perform indicated analyses?	Yes No
11.	Are these work share samples?	Yes No
	If yes, Questions 12-16 have been checked at the originating laboratory.	
12.	Were all preserved sample(s) at the correct pH upon receipt?	Yes No NA pH Strip Lot# HC902937
13.	Were VOAs on the COC?	Yes No
14.	Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes No NA
15.	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	Yes No
16.	Was a LL Hg or Me Hg trip blank present? ____	Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

18. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

ORIGIN ID:LANA (248) 994-2253
BILL COBERN
ARCADIS
28550 CABOT DR STE 500
NOVI, MI 48377
UNITED STATES US
SHIP DATE: 05JU
ACTWGT: 55.40 LI
CAD: 6991534/SSF
DIMS: 26x14x13 1
BILL THIRD PARTY
TO SAMPLE RECEIVING
EUROFINS TEST AMERICA
4101 SHUFFEL ST NW
NORTH CANTON OH 44720
(330) 497-9396
REF:
DEPT:
FedEx
Express
SATURDAY 12:00P
PRIORITY OVERNIGHT
TRK# 0215 8127 9323 8505
XO PHDA
44720
OH-US CLE
B
5
12:00
RT 918
ST F1

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: DelMonico, Michael	Carrier Tracking No(s):	COC No: 240-121571.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: michael.delmonico@testamericainc.com	State of Origin: Michigan	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-131478-1
Address: 30 Community Drive, Suite 11,	Due Date Requested: 6/19/2020			
City: South Burlington	TAT Requested (days):			
State, Zip: VT, 05403				
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:			
Email:	WO #:			
Project Name: Racer Lansing	Project #: 24017406			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522/522_CWA_Prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
FB-05_060420 (240-131478-1)	6/4/20	13:45 Eastern		Water			X	1	
MW-12-02_060420 (240-131478-2)	6/4/20	14:50 Eastern		Water			X	1	
MW-19-12S_060420 (240-131478-3)	6/4/20	16:10 Eastern		Water			X	1	
MW-12-06_060420 (240-131478-4)	6/4/20	17:35 Eastern		Water			X	1	
MW-13-44_060420 (240-131478-5)	6/4/20	18:50 Eastern		Water			X	1	
MW-12-01_060520 (240-131478-6)	6/5/20	09:05 Eastern		Water			X	1	
MW-12-05R_060520 (240-131478-7)	6/5/20	10:20 Eastern		Water			X	1	
MW-17-87_060520 (240-131478-8)	6/5/20	11:45 Eastern		Water			X	1	
MW-19-1180_060520 (240-131478-9)	6/5/20	12:50 Eastern		Water			X	1	

240-131478 COC

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

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

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	6-8-20 1230	ZAO		6/9/2020 10:30	TA BUR
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.0

Ver: 01/16/2019

7/6/2020 (Rev. 1)

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: DelMonico, Michael	Carrier Tracking No(s):	COC No: 240-121571.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: michael.delmonico@testamericainc.com	State of Origin: Michigan	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-131478-1
Address: 30 Community Drive, Suite 11,	Due Date Requested: 6/19/2020			
City: South Burlington	TAT Requested (days):			
State, Zip: VT, 05403				
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:			
Email:	WO #:			
Project Name: Racer Lansing	Project #: 24017406			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522/522_CWA_Prep	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-19-118S_060520 (240-131478-10)	6/5/20	13:40 Eastern		Water			X	1	
DUP-05_060520 (240-131478-11)	6/5/20	Eastern		Water			X	1	

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

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

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		6-5-20 0230	240		6/9/2020 10:30	TAL-8
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.0

Ver: 01/16/2019

eurofins | Environment Testing TestAmerica

ORIGIN ID:PHDA (330) 312-0176
EUROFINS TESTAMERICA CANTON
4101 SHUFFEL STREET NW
NORTH CANTON, OH 447206900
UNITED STATES US

SHIP DATE: 08JUN20
ACTWGT: 40.70 LB
CAD: 0562057/CAFE3313
BILL RECIPIENT

TO ENVIRONMENTAL SAMPLE RECEIPT
TESTAMERICA-BURLINGTON
30 COMMUNITY DRIVE
SOUTH BURLINGTON VT 05403
(802) 660-1990
DEPT: AL HAIDET

FedEx Express

TRK# 0201 1103 6129 3842

TUE - 09 JUN 10:30
PRIORITY OVERNIGH

NL BTVA

0540
VT-US BT

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 240-131478-1

Login Number: 131478
List Number: 2
Creator: Lavigne, Scott M

List Source: Eurofins TestAmerica, Burlington
List Creation: 06/09/20 01:22 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.0ºC
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Quality Control Report

Report ID: QC-S14456-02
Generated on 07/07/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14456.01-S14456.08
Project: 30042872 / RACER Lansing - Plant 6
Submitted Date/Time: 06/03/2020 08:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-9)
Prep Batch Summary (Page 10)
Surrogates per Lab Sample (Pages 11-17)
Surrogates per QC Sample (Pages 18-21)
Batch QC Results (Pages 22-38)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S14456.01
Sample Tag: EB-04_060220
Collected Date/Time: 06/02/2020 11:00
Matrix: Liquid
COC Reference: 124704

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 11:46	200604A7	VF200604W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14456.02

Sample Tag: MWBP-12-UST1-4_060220

Collected Date/Time: 06/02/2020 13:10

Matrix: Groundwater

COC Reference: 124704

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Metals						
Arsenic	E200.8	06/08/20 13:04	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/08/20 13:04	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Copper	E200.8	06/08/20 13:04	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Lead	E200.8	06/08/20 13:04	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/08/20 13:04	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/08/20 13:04	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/03/20 22:07	P200603	SF200603W01	Yes	BLK/LCS/LCSD
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 13:06	200610A3	VF200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14456.03
Sample Tag: FB-03_060220
Collected Date/Time: 06/02/2020 13:15
Matrix: Liquid
COC Reference: 124704

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 12:06	200604A7	VF200604W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14456.04

Sample Tag: MWBP-11-UST1-4_060220

Collected Date/Time: 06/02/2020 14:05

Matrix: Groundwater

COC Reference: 124704

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Metals						
Arsenic	E200.8	06/08/20 13:07	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/08/20 13:07	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Copper	E200.8	06/08/20 13:07	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Lead	E200.8	06/08/20 13:07	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/08/20 13:07	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/08/20 13:07	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 19:18	200604A7	VF200604W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14456.05

Sample Tag: MW-14-66_060220

Collected Date/Time: 06/02/2020 15:20

Matrix: Groundwater

COC Reference: 124704

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Metals						
Arsenic	E200.8	06/08/20 13:08	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/08/20 13:08	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Copper	E200.8	06/08/20 13:08	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Lead	E200.8	06/08/20 13:08	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/08/20 13:08	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/08/20 13:08	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD

Lab Sample ID: S14456.06

Sample Tag: MW-04-01(6)_060220

Collected Date/Time: 06/02/2020 13:30

Matrix: Groundwater

COC Reference: 124704

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 12:47	200610A9	VS200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14456.07

Sample Tag: MW-03-06_060220

Collected Date/Time: 06/02/2020 15:10

Matrix: Groundwater

COC Reference: 124704

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 13:10	200610A9	VS200610W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 19:57	200604A7	VF200604W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14456.08

Sample Tag: Trip Blank_060220

Collected Date/Time: 06/02/2020 00:01

Matrix: Liquid

COC Reference: 124704

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 12:25	200604A7	VF200604W2	Yes	BLK/LCS/LCSD

Metals, Prep Batch ID: MTD-060820-2

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14456.02	Arsenic	E200.8	06/08/20 13:04	MT4-20-0608B
S14456.02	Chromium	E200.8	06/08/20 13:04	MT4-20-0608B
S14456.02	Copper	E200.8	06/08/20 13:04	MT4-20-0608B
S14456.02	Lead	E200.8	06/08/20 13:04	MT4-20-0608B
S14456.02	Nickel	E200.8	06/08/20 13:04	MT4-20-0608B
S14456.02	Vanadium	E200.8	06/08/20 13:04	MT4-20-0608B
S14456.04	Arsenic	E200.8	06/08/20 13:07	MT4-20-0608B
S14456.04	Chromium	E200.8	06/08/20 13:07	MT4-20-0608B
S14456.04	Copper	E200.8	06/08/20 13:07	MT4-20-0608B
S14456.04	Lead	E200.8	06/08/20 13:07	MT4-20-0608B
S14456.04	Nickel	E200.8	06/08/20 13:07	MT4-20-0608B
S14456.04	Vanadium	E200.8	06/08/20 13:07	MT4-20-0608B
S14456.05	Arsenic	E200.8	06/08/20 13:08	MT4-20-0608B
S14456.05	Chromium	E200.8	06/08/20 13:08	MT4-20-0608B
S14456.05	Copper	E200.8	06/08/20 13:08	MT4-20-0608B
S14456.05	Lead	E200.8	06/08/20 13:08	MT4-20-0608B
S14456.05	Nickel	E200.8	06/08/20 13:08	MT4-20-0608B
S14456.05	Vanadium	E200.8	06/08/20 13:08	MT4-20-0608B

Organics - Semi-Volatiles, Prep Batch ID: SF200603W01

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14456.02	Semi-Volatile Organics - MDEQ	SW8270D	06/03/20 22:07	P200603

Organics - Volatiles, Prep Batch ID: VF200604W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14456.01	Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 11:46	200604A7
S14456.03	Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 12:06	200604A7
S14456.04	Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 19:18	200604A7
S14456.07	Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 19:57	200604A7
S14456.08	Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 12:25	200604A7

Organics - Volatiles, Prep Batch ID: VF200610W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14456.02	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 13:06	200610A3

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14456.06	1,4-Dioxane	SW8260B - SIM	06/10/20 12:47	200610A9
S14456.07	1,4-Dioxane	SW8260B - SIM	06/10/20 13:10	200610A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14456.01

Sample Tag: EB-04_060220

Collected Date/Time: 06/02/2020 11:00

Matrix: Liquid

COC Reference: 124704

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604A7, Run Date: 06/04/2020 11:46, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**101.0**	80.0	124.0
1,2-Dichloroethane-D4		**97.5**	72.0	125.0
Toluene-D8		**99.2**	89.0	112.0

Lab Sample ID: S14456.02

Sample Tag: MWBP-12-UST1-4_060220

Collected Date/Time: 06/02/2020 13:10

Matrix: Groundwater

COC Reference: 124704

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200603, Run Date: 06/03/2020 22:07, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**29.0**	10.0	110.0
Phenol-D5		**20.1**	10.0	110.0
Nitrobenzene-D5		**46.4**	10.0	114.0
2-Fluorobiphenyl		**48.4**	10.0	116.0
2,4,6-Tribromophenol		**47.1**	10.0	123.0
Terphenyl-D14		**59.2**	10.0	141.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200610A3, Run Date: 06/10/2020 13:06, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**88.8**	80.0	124.0
1,2-Dichloroethane-D4		**108.6**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14456.03

Sample Tag: FB-03_060220

Collected Date/Time: 06/02/2020 13:15

Matrix: Liquid

COC Reference: 124704

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604A7, Run Date: 06/04/2020 12:06, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**101.4**	80.0	124.0
1,2-Dichloroethane-D4		**96.2**	72.0	125.0
Toluene-D8		**98.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14456.04

Sample Tag: MWBP-11-UST1-4_060220

Collected Date/Time: 06/02/2020 14:05

Matrix: Groundwater

COC Reference: 124704

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604A7, Run Date: 06/04/2020 19:18, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**98.7**	80.0	124.0
1,2-Dichloroethane-D4		**95.2**	72.0	125.0
Toluene-D8		**101.9**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14456.06

Sample Tag: MW-04-01(6)_060220

Collected Date/Time: 06/02/2020 13:30

Matrix: Groundwater

COC Reference: 124704

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 12:47, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14456.07

Sample Tag: MW-03-06_060220

Collected Date/Time: 06/02/2020 15:10

Matrix: Groundwater

COC Reference: 124704

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 13:10, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604A7, Run Date: 06/04/2020 19:57, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.4**	80.0	124.0
1,2-Dichloroethane-D4		**104.4**	72.0	125.0
Toluene-D8		**99.1**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14456.08

Sample Tag: Trip Blank_060220

Collected Date/Time: 06/02/2020 00:01

Matrix: Liquid

COC Reference: 124704

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604A7, Run Date: 06/04/2020 12:25, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**101.2**	80.0	124.0
1,2-Dichloroethane-D4		**97.5**	72.0	125.0
Toluene-D8		**98.9**	89.0	112.0

Organics - Semi-Volatiles, Prep Batch ID: SF200603W01

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: P200603.BLKW03A

Run in Batch: P200603, Run Date: 06/03/2020 19:02, Prep Date: 06/03/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**35.4**	10.0	110.0
Phenol-D5		**23.7**	10.0	110.0
Nitrobenzene-D5		**64.3**	10.0	114.0
2-Fluorobiphenyl		**65.3**	10.0	116.0
2,4,6-Tribromophenol		**64.7**	10.0	123.0
Terphenyl-D14		**71.6**	10.0	141.0

Laboratory Control Sample (LCS)

Lab Sample ID: P200603.LCSW03A

Run in Batch: P200603, Run Date: 06/03/2020 19:33, Prep Date: 06/03/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**35.6**	10.0	110.0
Phenol-D5		**24.5**	10.0	110.0
Nitrobenzene-D5		**65.5**	10.0	114.0
2-Fluorobiphenyl		**69.4**	10.0	116.0
2,4,6-Tribromophenol		**72.6**	10.0	123.0
Terphenyl-D14		**75.3**	10.0	141.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200603.LCSDW03A, Parent Sample ID: P200603.LCSW03A

Run in Batch: P200603, Run Date: 06/03/2020 20:04, Prep Date: 06/03/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**35.2**	10.0	110.0
Phenol-D5		**24.3**	10.0	110.0
Nitrobenzene-D5		**65.2**	10.0	114.0
2-Fluorobiphenyl		**67.0**	10.0	116.0
2,4,6-Tribromophenol		**69.3**	10.0	123.0
Terphenyl-D14		**79.5**	10.0	141.0

Organics - Volatiles, Prep Batch ID: VF200604W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200604A7.BLKW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 10:48, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**101.5**	80.0	124.0
1,2-Dichloroethane-D4		**98.7**	72.0	125.0
Toluene-D8		**98.5**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**102.7**	80.0	124.0
1,2-Dichloroethane-D4		**99.4**	72.0	125.0
Toluene-D8		**99.8**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200604A7.LCSDW04A, Parent Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:50, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**102.3**	80.0	124.0
1,2-Dichloroethane-D4		**97.4**	72.0	125.0
Toluene-D8		**100.5**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200610W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**88.2**	80.0	124.0
1,2-Dichloroethane-D4		**105.6**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.6**	80.0	124.0
1,2-Dichloroethane-D4		**101.8**	72.0	125.0
Toluene-D8		**101.0**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**99.8**	80.0	124.0
1,2-Dichloroethane-D4		**104.8**	72.0	125.0
Toluene-D8		**100.6**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200610W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Metals, Prep Batch ID: MTD-060820-2

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Blank (BLK)

Lab Sample ID: MT4-20-0608B.020.LRB

Run in Batch: MT4-20-0608B, Run Date: 06/08/2020 12:58, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Arsenic		ND	0.0004	mg/L
Chromium		ND	0.001	mg/L
Copper		ND	0.001	mg/L
Lead		ND	0.0006	mg/L
Nickel		ND	0.001	mg/L
Vanadium		ND	0.001	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: MT4-20-0608B.018.LCS

Run in Batch: MT4-20-0608B, Run Date: 06/08/2020 12:55, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Arsenic		103	85	115
Chromium		100	85	115
Copper		101	85	115
Lead		95	85	115
Nickel		99	85	115
Vanadium		101	85	115

Matrix Spike (MS)

Lab Sample ID: MT4-20-0608B.037.MS, Parent Sample ID: S14576.10

Run in Batch: MT4-20-0608B, Run Date: 06/08/2020 13:18, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Arsenic		102	75	125
Chromium		104	75	125
Copper		96	75	125
Lead		90	75	125
Nickel		98	75	125
Vanadium		110	75	125

Matrix Spike Duplicate (MSD)

Lab Sample ID: MT4-20-0608B.038.MSD, Parent Sample ID: MT4-20-0608B.037.MS

Run in Batch: MT4-20-0608B, Run Date: 06/08/2020 13:18, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Arsenic		106	75	125	3	20
Chromium		106	75	125	2	20
Copper		97	75	125	2	20
Lead		90	75	125	0	20
Nickel		98	75	125	0	20
Vanadium		110	75	125	0	20

Organics - Semi-Volatiles, Prep Batch ID: SF200603W01

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

Blank (BLK)

Lab Sample ID: P200603.BLKW03A

Run in Batch: P200603, Run Date: 06/03/2020 19:02, Prep Date: 06/03/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acenaphthene		ND	0.00050	mg/l
Acenaphthylene		ND	0.00050	mg/l
Anthracene		ND	0.00050	mg/l
Benzo(a)anthracene		ND	0.00050	mg/l
Benzo(b)fluoranthene		ND	0.00050	mg/l
Benzo(k)fluoranthene		ND	0.00050	mg/l
Benzo(ghi)perylene		ND	0.00050	mg/l
Benzo(a)pyrene		ND	0.00050	mg/l
bis(2-Chloroethoxy)methane		ND	0.00050	mg/l
bis(2-Chloroethyl)ether		ND	0.00050	mg/l
bis(2-Chloroisopropyl)ether		ND	0.00050	mg/l
bis(2-Ethylhexyl)phthalate		ND	0.00050	mg/l
4-Bromophenyl phenyl ether		ND	0.00050	mg/l
Butyl benzyl phthalate		ND	0.00050	mg/l
4-Chloroaniline		ND	0.00050	mg/l
2-Chloronaphthalene		ND	0.00050	mg/l
4-Chloro-3-methylphenol		ND	0.00050	mg/l
2-Chlorophenol		ND	0.00050	mg/l
4-Chlorophenyl phenyl ether		ND	0.00050	mg/l
Chrysene		ND	0.00050	mg/l
3-, 4-Methylphenol (p,m-Cresol)		ND	0.00100	mg/l
2-Methylphenol (o-Cresol)		ND	0.00050	mg/l
Dibenzo(ah)anthracene		ND	0.00050	mg/l
Dibenzofuran		ND	0.00050	mg/l
di-n-Butyl phthalate	*	0.00055	0.00050	mg/l
1,2-Dichlorobenzene		ND	0.00050	mg/l
1,3-Dichlorobenzene		ND	0.00050	mg/l
1,4-Dichlorobenzene		ND	0.00050	mg/l
3,3'-Dichlorobenzidine		ND	0.00050	mg/l
2,4-Dichlorophenol		ND	0.00050	mg/l
Diethyl phthalate		ND	0.00050	mg/l
2,4-Dimethylphenol		ND	0.00050	mg/l
Dimethyl phthalate		ND	0.00050	mg/l
4,6-Dinitro-2-methylphenol		ND	0.00050	mg/l
2,4-Dinitrophenol		ND	0.00050	mg/l
2,4-Dinitrotoluene		ND	0.00050	mg/l
2,6-Dinitrotoluene		ND	0.00050	mg/l
1,2-Diphenylhydrazine		ND	0.00050	mg/l
di-n-Octyl phthalate		ND	0.00050	mg/l
Fluoranthene		ND	0.00050	mg/l
Fluorene		ND	0.00050	mg/l
Hexachlorobenzene		ND	0.00050	mg/l
Hexachlorobutadiene		ND	0.00050	mg/l
Hexachlorocyclopentadiene		ND	0.00050	mg/l
Hexachloroethane		ND	0.00050	mg/l
Indeno(1,2,3-cd)pyrene		ND	0.00050	mg/l

Organics - Semi-Volatiles, Prep Batch ID: SF200603W01 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: P200603.BLKW03A

Run in Batch: P200603, Run Date: 06/03/2020 19:02, Prep Date: 06/03/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Isophorone		ND	0.00050	mg/l
2-Methylnaphthalene		ND	0.00050	mg/l
Naphthalene		ND	0.00050	mg/l
2-Nitroaniline		ND	0.00050	mg/l
3-Nitroaniline		ND	0.00050	mg/l
4-Nitroaniline		ND	0.00050	mg/l
Nitrobenzene		ND	0.00050	mg/l
2-Nitrophenol		ND	0.00050	mg/l
4-Nitrophenol		ND	0.00050	mg/l
N-Nitrosodiphenylamine		ND	0.00050	mg/l
N-Nitrosodi-n-propylamine		ND	0.00050	mg/l
Pentachlorophenol		ND	0.00050	mg/l
Phenanthrene		ND	0.00050	mg/l
Phenol		ND	0.00050	mg/l
Pyrene		ND	0.00050	mg/l
1,2,4-Trichlorobenzene		ND	0.00050	mg/l
2,4,5-Trichlorophenol		ND	0.00050	mg/l
2,4,6-Trichlorophenol		ND	0.00050	mg/l

Laboratory Control Sample (LCS)

Lab Sample ID: P200603.LCSW03A

Run in Batch: P200603, Run Date: 06/03/2020 19:33, Prep Date: 06/03/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		65.8	37.82	102.82
Acenaphthylene		72.2	34.75	114.76
Anthracene		69.9	38.29	107.17
Benzo(a)anthracene		73.7	39.45	103.23
Benzo(b)fluoranthene		67.4	39.3	105.62
Benzo(k)fluoranthene		63.5	37.32	99.27
Benzo(ghi)perylene		67.5	25.65	121.02
Benzo(a)pyrene		63.3	41	102.98
bis(2-Chloroethoxy)methane		64.3	38.96	94.94
bis(2-Chloroethyl)ether		54.8	32.79	92.32
bis(2-Chloroisopropyl)ether		49.2	28.96	95.55
bis(2-Ethylhexyl)phthalate		67.7	43.38	102.89
4-Bromophenyl phenyl ether		69.5	36.32	111.95
Butyl benzyl phthalate		67.2	41.29	98.17
4-Chloroaniline		51.9	11.53	72.6
2-Chloronaphthalene		63.6	36.7	102.59
4-Chloro-3-methylphenol		58.9	39.63	104.28
2-Chlorophenol		56.0	34.18	94.55
4-Chlorophenyl phenyl ether		66.7	38.63	115.88
Chrysene		71.7	42.42	104.5
3-, 4-Methylphenol (p,m-Cresol)		41.5	36.4	115.4
2-Methylphenol (o-Cresol)		48.6	37.3	120.0
Dibenzo(ah)anthracene		63.2	31.37	119.17

Organics - Semi-Volatiles, Prep Batch ID: SF200603W01 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: P200603.LCSW03A

Run in Batch: P200603, Run Date: 06/03/2020 19:33, Prep Date: 06/03/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Dibenzofuran		68.1	40.25	104.89
di-n-Butyl phthalate		71.0	42.66	109.16
1,2-Dichlorobenzene		45.8	35.29	149.51
1,3-Dichlorobenzene		42.6	32.15	155.22
1,4-Dichlorobenzene		42.9	33.22	151.25
3,3'-Dichlorobenzidine		64.0	26.1	103.71
2,4-Dichlorophenol		63.0	41.58	98.03
Diethyl phthalate		68.1	43.35	109.88
2,4-Dimethylphenol		62.1	39.69	104.6
Dimethyl phthalate		70.4	44.99	102.98
4,6-Dinitro-2-methylphenol		67.0	19.98	101.32
2,4-Dinitrophenol		62.8	10	109.59
2,4-Dinitrotoluene		69.2	37.33	115.88
2,6-Dinitrotoluene		69.9	41.24	106.63
1,2-Diphenylhydrazine		65.2	39.95	95.79
di-n-Octyl phthalate		64.7	38.19	107.3
Fluoranthene		72.7	39.79	106.64
Fluorene		67.8	36.94	108.4
Hexachlorobenzene		69.1	34.37	118.98
Hexachlorobutadiene		43.6	16.99	122.89
Hexachlorocyclopentadiene		46.5	21.56	132.1
Hexachloroethane		37.3	22.96	157.68
Indeno(1,2,3-cd)pyrene		66.1	29.55	116.59
Isophorone		65.0	33.67	101.86
2-Methylnaphthalene		56.9	29.6	140.3
Naphthalene		56.0	31.37	140.54
2-Nitroaniline		68.6	41.37	98.69
3-Nitroaniline		54.0	22.05	86.36
4-Nitroaniline		63.2	31.15	107.83
Nitrobenzene		58.6	38.21	124.16
2-Nitrophenol		63.1	38.56	92.8
4-Nitrophenol		34.6	13.39	116.72
N-Nitrosodiphenylamine		70.8	33.26	108.23
N-Nitrosodi-n-propylamine		56.3	32.25	95.51
Pentachlorophenol		59.4	17.09	112.61
Phenanthrene		67.6	37.67	105.05
Phenol		24.1	10	103.25
Pyrene		72.9	38.69	102.69
1,2,4-Trichlorobenzene		50.7	39.12	156.7
2,4,5-Trichlorophenol		72.3	38.05	112.24
2,4,6-Trichlorophenol		67.8	38.38	108.99

Organics - Semi-Volatiles, Prep Batch ID: SF200603W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200603.LCSDW03A, Parent Sample ID: P200603.LCSW03A

Run in Batch: P200603, Run Date: 06/03/2020 20:04, Prep Date: 06/03/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		65.6	37.82	102.82	0.3	30.0
Acenaphthylene		71.5	34.75	114.76	0.9	30.0
Anthracene		69.8	38.29	107.17	0.1	30.0
Benzo(a)anthracene		72.0	39.45	103.23	2.3	30.0
Benzo(b)fluoranthene		68.1	39.3	105.62	1.0	30.0
Benzo(k)fluoranthene		59.3	37.32	99.27	6.7	30.0
Benzo(ghi)perylene		69.3	25.65	121.02	2.7	30.0
Benzo(a)pyrene		65.8	41	102.98	4.0	30.0
bis(2-Chloroethoxy)methane		64.0	38.96	94.94	0.4	30.0
bis(2-Chloroethyl)ether		54.8	32.79	92.32	0.1	30.0
bis(2-Chloroisopropyl)ether		48.5	28.96	95.55	1.5	30.0
bis(2-Ethylhexyl)phthalate		65.3	43.38	102.89	3.6	30.0
4-Bromophenyl phenyl ether		71.2	36.32	111.95	2.4	30.0
Butyl benzyl phthalate		66.7	41.29	98.17	0.8	30.0
4-Chloroaniline		52.2	11.53	72.6	0.7	30.0
2-Chloronaphthalene		63.2	36.7	102.59	0.7	30.0
4-Chloro-3-methylphenol		59.8	39.63	104.28	1.6	30.0
2-Chlorophenol		56.0	34.18	94.55	0.1	30.0
4-Chlorophenyl phenyl ether		67.8	38.63	115.88	1.6	30.0
Chrysene		69.6	42.42	104.5	3.0	30.0
3-, 4-Methylphenol (p,m-Cresol)		41.3	36.4	115.4	0.4	30.0
2-Methylphenol (o-Cresol)		48.9	37.3	120.0	0.7	30.0
Dibenzo(ah)anthracene		62.2	31.37	119.17	1.6	30.0
Dibenzofuran		66.9	40.25	104.89	1.8	30.0
di-n-Butyl phthalate		71.3	42.66	109.16	0.4	30.0
1,2-Dichlorobenzene		45.7	35.29	149.51	0.4	30.0
1,3-Dichlorobenzene		42.6	32.15	155.22	0.0	30.0
1,4-Dichlorobenzene		43.1	33.22	151.25	0.7	30.0
3,3'-Dichlorobenzidine		59.7	26.1	103.71	6.9	30.0
2,4-Dichlorophenol		63.4	41.58	98.03	0.7	30.0
Diethyl phthalate		67.9	43.35	109.88	0.3	30.0
2,4-Dimethylphenol		62.5	39.69	104.6	0.6	30.0
Dimethyl phthalate		69.1	44.99	102.98	1.9	30.0
4,6-Dinitro-2-methylphenol		70.2	19.98	101.32	4.6	30.0
2,4-Dinitrophenol		64.8	10	109.59	3.1	30.0
2,4-Dinitrotoluene		68.5	37.33	115.88	1.0	30.0
2,6-Dinitrotoluene		69.7	41.24	106.63	0.3	30.0
1,2-Diphenylhydrazine		67.1	39.95	95.79	2.8	30.0
di-n-Octyl phthalate		66.3	38.19	107.3	2.4	30.0
Fluoranthene		73.0	39.79	106.64	0.5	30.0
Fluorene		68.3	36.94	108.4	0.8	30.0
Hexachlorobenzene		72.2	34.37	118.98	4.4	30.0
Hexachlorobutadiene		43.9	16.99	122.89	0.8	30.0
Hexachlorocyclopentadiene		45.2	21.56	132.1	2.8	30.0
Hexachloroethane		36.8	22.96	157.68	1.4	30.0
Indeno(1,2,3-cd)pyrene		67.6	29.55	116.59	2.3	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF200603W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: P200603.LCSDW03A, Parent Sample ID: P200603.LCSW03A

Run in Batch: P200603, Run Date: 06/03/2020 20:04, Prep Date: 06/03/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isophorone		65.4	33.67	101.86	0.7	30.0
2-Methylnaphthalene		56.7	29.6	140.3	0.2	30.0
Naphthalene		56.8	31.37	140.54	1.3	30.0
2-Nitroaniline		68.0	41.37	98.69	0.9	30.0
3-Nitroaniline		55.2	22.05	86.36	2.3	30.0
4-Nitroaniline		62.9	31.15	107.83	0.4	30.0
Nitrobenzene		58.8	38.21	124.16	0.4	30.0
2-Nitrophenol		62.4	38.56	92.8	1.1	30.0
4-Nitrophenol		35.0	13.39	116.72	1.3	30.0
N-Nitrosodiphenylamine		70.0	33.26	108.23	1.1	30.0
N-Nitrosodi-n-propylamine		55.6	32.25	95.51	1.2	30.0
Pentachlorophenol		61.3	17.09	112.61	3.1	30.0
Phenanthrene		66.9	37.67	105.05	1.0	30.0
Phenol		24.2	10	103.25	0.5	30.0
Pyrene		71.2	38.69	102.69	2.4	30.0
1,2,4-Trichlorobenzene		50.3	39.12	156.7	0.9	30.0
2,4,5-Trichlorophenol		70.8	38.05	112.24	2.1	30.0
2,4,6-Trichlorophenol		68.5	38.38	108.99	1.1	30.0

Organics - Volatiles, Prep Batch ID: VF200604W2

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

Blank (BLK)

Lab Sample ID: 200604A7.BLKW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 10:48, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200604W2 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200604A7.BLKW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 10:48, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		104.2	67.4	121.2
Acetone		122.4	29.9	161.5
Methyl iodide		107.2	68.8	116.4
Carbon disulfide		103.9	63.8	137.4
tert-Methyl butyl ether (MTBE)		100.5	73.2	122.4
Acrylonitrile		100.9	69.9	128.9
2-Butanone (MEK)		101.6	44.0	134.4
Dichlorodifluoromethane		117.1	10.0	222.8
Chloromethane		108.0	23.8	166.5
Vinyl chloride		107.4	43.5	149.1
Bromomethane		113.9	56.8	151.3
Chloroethane		104.7	53.4	149.4
Trichlorofluoromethane		103.8	59.7	151.8
1,1-Dichloroethene		105.5	69.6	139.4
Methylene chloride		98.6	73.3	121.1
trans-1,2-Dichloroethene		104.0	73.6	129.3
1,1-Dichloroethane		104.8	71.5	126.2
cis-1,2-Dichloroethene		103.3	76.6	122.1
Tetrahydrofuran		103.3	59.0	117.9
Chloroform		104.5	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200604W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		105.0	78.2	120.8
1,1,1-Trichloroethane		104.9	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.4	71.6	125.2
2-Hexanone		100.5	55.4	136.9
Carbon tetrachloride		106.7	72.6	133.0
Benzene		104.4	79.9	124.9
1,2-Dichloroethane		101.6	76.0	126.3
Trichloroethene		104.0	79.7	124.2
1,2-Dichloropropane		104.8	78.6	126.4
Bromodichloromethane		106.8	80.4	128.2
Dibromomethane		105.9	76.9	122.1
cis-1,3-Dichloropropene		107.5	79.8	129.9
Toluene		104.8	79.8	124.5
trans-1,3-Dichloropropene		108.2	74.0	131.3
1,1,2-Trichloroethane		104.5	78.7	123.1
Tetrachloroethene		100.9	74.5	124.5
trans-1,4-Dichloro-2-butene		107.2	68.6	135.4
Dibromochloromethane		107.3	74.6	127.2
1,2-Dibromoethane		105.4	70.3	133.7
Chlorobenzene		105.7	79.2	122.7
1,1,1,2-Tetrachloroethane		106.8	80.3	128.2
Ethylbenzene		106.5	79.5	129.1
p,m-Xylene		105.0	79.4	132.2
o-Xylene		105.3	80.2	131.0
Styrene		107.5	69.5	126.7
Isopropylbenzene		108.1	74.4	121.5
Bromoform		107.4	69.4	128.0
1,1,2,2-Tetrachloroethane		103.9	79.8	126.3
1,2,3-Trichloropropane		106.1	78.3	138.8
n-Propylbenzene		108.2	82.0	130.7
Bromobenzene		105.2	78.7	124.6
1,3,5-Trimethylbenzene		105.7	81.3	128.9
tert-Butylbenzene		106.1	80.7	128.9
1,2,4-Trimethylbenzene		106.0	81.4	130.8
sec-Butylbenzene		105.8	77.4	129.8
p-Isopropyltoluene		106.4	79.8	137.5
1,3-Dichlorobenzene		105.4	77.0	131.3
1,4-Dichlorobenzene		104.1	20.7	137.7
1,2-Dichlorobenzene		105.8	10.0	166.2
1,2,3-Trimethylbenzene		102.1	76.3	124.2
n-Butylbenzene		104.9	80.0	133.3
Hexachloroethane		104.5	23.8	138.1
1,2-Dibromo-3-chloropropane		103.8	21.2	189.4
1,2,4-Trichlorobenzene		106.1	27.4	143.4
1,2,3-Trichlorobenzene		105.8	75.4	131.4
Naphthalene		103.4	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200604W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		102.2	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200604A7.LCSDW04A, Parent Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:50, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		93.5	67.4	121.2	10.8	30.0
Acetone		113.5	29.9	161.5	7.5	30.0
Methyl iodide		98.0	68.8	116.4	9.0	30.0
Carbon disulfide		95.9	63.8	137.4	8.0	30.0
tert-Methyl butyl ether (MTBE)		90.6	73.2	122.4	10.3	30.0
Acrylonitrile		92.4	69.9	128.9	8.8	30.0
2-Butanone (MEK)		95.6	44.0	134.4	6.0	30.0
Dichlorodifluoromethane		111.0	10.0	222.8	5.4	30.0
Chloromethane		99.6	23.8	166.5	8.1	30.0
Vinyl chloride		100.6	43.5	149.1	6.6	30.0
Bromomethane		104.0	56.8	151.3	9.1	30.0
Chloroethane		97.0	53.4	149.4	7.7	30.0
Trichlorofluoromethane		96.6	59.7	151.8	7.1	30.0
1,1-Dichloroethene		98.7	69.6	139.4	6.7	30.0
Methylene chloride		89.4	73.3	121.1	9.8	30.0
trans-1,2-Dichloroethene		95.9	73.6	129.3	8.2	30.0
1,1-Dichloroethane		96.0	71.5	126.2	8.7	30.0
cis-1,2-Dichloroethene		93.1	76.6	122.1	10.4	30.0
Tetrahydrofuran		96.0	59.0	117.9	7.4	30.0
Chloroform		94.8	78.4	124.0	9.7	30.0
Bromochloromethane		95.2	78.2	120.8	9.8	30.0
1,1,1-Trichloroethane		96.7	79.4	130.9	8.2	30.0
4-Methyl-2-pentanone (MIBK)		91.1	71.6	125.2	7.6	30.0
2-Hexanone		94.7	55.4	136.9	5.9	30.0
Carbon tetrachloride		98.2	72.6	133.0	8.3	30.0
Benzene		95.5	79.9	124.9	8.9	30.0
1,2-Dichloroethane		93.2	76.0	126.3	8.7	30.0
Trichloroethene		96.4	79.7	124.2	7.6	30.0
1,2-Dichloropropane		97.0	78.6	126.4	7.8	30.0
Bromodichloromethane		96.5	80.4	128.2	10.1	30.0
Dibromomethane		96.9	76.9	122.1	8.9	30.0
cis-1,3-Dichloropropene		98.2	79.8	129.9	9.1	30.0
Toluene		97.2	79.8	124.5	7.4	30.0
trans-1,3-Dichloropropene		99.0	74.0	131.3	8.9	30.0
1,1,2-Trichloroethane		95.7	78.7	123.1	8.8	30.0
Tetrachloroethene		93.3	74.5	124.5	7.8	30.0
trans-1,4-Dichloro-2-butene		96.6	68.6	135.4	10.3	30.0
Dibromochloromethane		98.0	74.6	127.2	9.1	30.0
1,2-Dibromoethane		97.7	70.3	133.7	7.6	30.0
Chlorobenzene		96.5	79.2	122.7	9.1	30.0

Organics - Volatiles, Prep Batch ID: VF200604W2 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200604A7.LCSDW04A, Parent Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:50, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		96.0	80.3	128.2	10.7	30.0
Ethylbenzene		97.4	79.5	129.1	8.9	30.0
p,m-Xylene		96.4	79.4	132.2	8.6	30.0
o-Xylene		95.9	80.2	131.0	9.3	30.0
Styrene		97.1	69.5	126.7	10.1	30.0
Isopropylbenzene		97.8	74.4	121.5	10.1	30.0
Bromoform		98.3	69.4	128.0	8.8	30.0
1,1,2,2-Tetrachloroethane		95.2	79.8	126.3	8.7	30.0
1,2,3-Trichloropropane		95.8	78.3	138.8	10.2	30.0
n-Propylbenzene		99.0	82.0	130.7	8.8	30.0
Bromobenzene		95.0	78.7	124.6	10.1	30.0
1,3,5-Trimethylbenzene		97.2	81.3	128.9	8.3	30.0
tert-Butylbenzene		97.0	80.7	128.9	8.9	30.0
1,2,4-Trimethylbenzene		96.9	81.4	130.8	9.0	30.0
sec-Butylbenzene		97.6	77.4	129.8	8.1	30.0
p-Isopropyltoluene		97.9	79.8	137.5	8.3	30.0
1,3-Dichlorobenzene		94.5	77.0	131.3	10.9	30.0
1,4-Dichlorobenzene		95.0	20.7	137.7	9.2	30.0
1,2-Dichlorobenzene		95.8	10.0	166.2	9.9	30.0
1,2,3-Trimethylbenzene		91.0	76.3	124.2	11.5	30.0
n-Butylbenzene		96.5	80.0	133.3	8.3	30.0
Hexachloroethane		94.1	23.8	138.1	10.5	30.0
1,2-Dibromo-3-chloropropane		93.9	21.2	189.4	10.0	30.0
1,2,4-Trichlorobenzene		95.7	27.4	143.4	10.3	30.0
1,2,3-Trichlorobenzene		95.0	75.4	131.4	10.7	30.0
Naphthalene		93.2	32.9	135.8	10.4	30.0
2-Methylnaphthalene		94.2	25.5	165.5	8.2	30.0

Organics - Volatiles, Prep Batch ID: VF200610W1

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

Blank (BLK)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		101.0	67.4	121.2
Acetone		98.8	29.9	161.5
Methyl iodide		101.4	68.8	116.4
Carbon disulfide		105.3	63.8	137.4
tert-Methyl butyl ether (MTBE)		105.1	73.2	122.4
Acrylonitrile		104.3	69.9	128.9
2-Butanone (MEK)		95.2	44.0	134.4
Dichlorodifluoromethane		109.2	10.0	222.8
Chloromethane		100.0	23.8	166.5
Vinyl chloride		102.4	43.5	149.1
Bromomethane		102.0	56.8	151.3
Chloroethane		101.9	53.4	149.4
Trichlorofluoromethane		97.8	59.7	151.8
1,1-Dichloroethene		104.6	69.6	139.4
Methylene chloride		93.5	73.3	121.1
trans-1,2-Dichloroethene		101.3	73.6	129.3
1,1-Dichloroethane		100.5	71.5	126.2
cis-1,2-Dichloroethene		98.7	76.6	122.1
Tetrahydrofuran		99.9	59.0	117.9
Chloroform		98.1	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		99.4	78.2	120.8
1,1,1-Trichloroethane		104.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.2	71.6	125.2
2-Hexanone		101.4	55.4	136.9
Carbon tetrachloride		98.7	72.6	133.0
Benzene		96.5	79.9	124.9
1,2-Dichloroethane		93.9	76.0	126.3
Trichloroethene		97.6	79.7	124.2
1,2-Dichloropropane		98.7	78.6	126.4
Bromodichloromethane		99.4	80.4	128.2
Dibromomethane		95.5	76.9	122.1
cis-1,3-Dichloropropene		104.0	79.8	129.9
Toluene		97.8	79.8	124.5
trans-1,3-Dichloropropene		105.2	74.0	131.3
1,1,2-Trichloroethane		97.1	78.7	123.1
Tetrachloroethene		93.8	74.5	124.5
trans-1,4-Dichloro-2-butene		106.7	68.6	135.4
Dibromochloromethane		99.3	74.6	127.2
1,2-Dibromoethane		96.5	70.3	133.7
Chlorobenzene		96.5	79.2	122.7
1,1,1,2-Tetrachloroethane		98.7	80.3	128.2
Ethylbenzene		100.7	79.5	129.1
p,m-Xylene		99.5	79.4	132.2
o-Xylene		100.0	80.2	131.0
Styrene		102.7	69.5	126.7
Isopropylbenzene		101.9	74.4	121.5
Bromoform		100.2	69.4	128.0
1,1,2,2-Tetrachloroethane		95.1	79.8	126.3
1,2,3-Trichloropropane		93.3	78.3	138.8
n-Propylbenzene		100.2	82.0	130.7
Bromobenzene		96.1	78.7	124.6
1,3,5-Trimethylbenzene		100.3	81.3	128.9
tert-Butylbenzene		100.6	80.7	128.9
1,2,4-Trimethylbenzene		101.8	81.4	130.8
sec-Butylbenzene		100.6	77.4	129.8
p-Isopropyltoluene		102.7	79.8	137.5
1,3-Dichlorobenzene		96.2	77.0	131.3
1,4-Dichlorobenzene		93.8	20.7	137.7
1,2-Dichlorobenzene		93.9	10.0	166.2
1,2,3-Trimethylbenzene		97.3	76.3	124.2
n-Butylbenzene		101.8	80.0	133.3
Hexachloroethane		98.9	23.8	138.1
1,2-Dibromo-3-chloropropane		100.2	21.2	189.4
1,2,4-Trichlorobenzene		101.3	27.4	143.4
1,2,3-Trichlorobenzene		99.5	75.4	131.4
Naphthalene		106.7	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		98.0	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		107.4	67.4	121.2	6.2	30.0
Acetone		104.7	29.9	161.5	5.8	30.0
Methyl iodide		106.7	68.8	116.4	5.1	30.0
Carbon disulfide		110.8	63.8	137.4	5.1	30.0
tert-Methyl butyl ether (MTBE)		110.6	73.2	122.4	5.1	30.0
Acrylonitrile		112.6	69.9	128.9	7.7	30.0
2-Butanone (MEK)		100.9	44.0	134.4	5.8	30.0
Dichlorodifluoromethane		111.0	10.0	222.8	1.7	30.0
Chloromethane		109.0	23.8	166.5	8.6	30.0
Vinyl chloride		107.3	43.5	149.1	4.6	30.0
Bromomethane		105.5	56.8	151.3	3.4	30.0
Chloroethane		106.0	53.4	149.4	4.0	30.0
Trichlorofluoromethane		101.6	59.7	151.8	3.8	30.0
1,1-Dichloroethene		103.8	69.6	139.4	0.7	30.0
Methylene chloride		99.2	73.3	121.1	6.0	30.0
trans-1,2-Dichloroethene		107.3	73.6	129.3	5.8	30.0
1,1-Dichloroethane		106.0	71.5	126.2	5.3	30.0
cis-1,2-Dichloroethene		105.2	76.6	122.1	6.3	30.0
Tetrahydrofuran		106.8	59.0	117.9	6.6	30.0
Chloroform		103.9	78.4	124.0	5.8	30.0
Bromochloromethane		105.5	78.2	120.8	6.0	30.0
1,1,1-Trichloroethane		108.5	79.4	130.9	4.2	30.0
4-Methyl-2-pentanone (MIBK)		103.8	71.6	125.2	5.5	30.0
2-Hexanone		103.9	55.4	136.9	2.5	30.0
Carbon tetrachloride		100.6	72.6	133.0	2.0	30.0
Benzene		99.0	79.9	124.9	2.5	30.0
1,2-Dichloroethane		96.6	76.0	126.3	2.8	30.0
Trichloroethene		99.5	79.7	124.2	1.8	30.0
1,2-Dichloropropane		102.9	78.6	126.4	4.1	30.0
Bromodichloromethane		102.3	80.4	128.2	2.9	30.0
Dibromomethane		99.2	76.9	122.1	3.8	30.0
cis-1,3-Dichloropropene		109.1	79.8	129.9	4.8	30.0
Toluene		99.9	79.8	124.5	2.1	30.0
trans-1,3-Dichloropropene		109.2	74.0	131.3	3.8	30.0
1,1,2-Trichloroethane		101.1	78.7	123.1	4.0	30.0
Tetrachloroethene		96.4	74.5	124.5	2.6	30.0
trans-1,4-Dichloro-2-butene		108.6	68.6	135.4	1.7	30.0
Dibromochloromethane		102.7	74.6	127.2	3.3	30.0
1,2-Dibromoethane		99.9	70.3	133.7	3.5	30.0
Chlorobenzene		99.1	79.2	122.7	2.6	30.0

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		100.9	80.3	128.2	2.2	30.0
Ethylbenzene		103.0	79.5	129.1	2.2	30.0
p,m-Xylene		101.3	79.4	132.2	1.8	30.0
o-Xylene		102.4	80.2	131.0	2.3	30.0
Styrene		105.2	69.5	126.7	2.5	30.0
Isopropylbenzene		104.3	74.4	121.5	2.3	30.0
Bromoform		102.7	69.4	128.0	2.5	30.0
1,1,2,2-Tetrachloroethane		99.1	79.8	126.3	4.1	30.0
1,2,3-Trichloropropane		96.1	78.3	138.8	3.0	30.0
n-Propylbenzene		102.8	82.0	130.7	2.6	30.0
Bromobenzene		97.9	78.7	124.6	1.9	30.0
1,3,5-Trimethylbenzene		102.8	81.3	128.9	2.5	30.0
tert-Butylbenzene		102.7	80.7	128.9	2.1	30.0
1,2,4-Trimethylbenzene		103.3	81.4	130.8	1.5	30.0
sec-Butylbenzene		106.6	77.4	129.8	5.8	30.0
p-Isopropyltoluene		108.2	79.8	137.5	5.2	30.0
1,3-Dichlorobenzene		100.4	77.0	131.3	4.3	30.0
1,4-Dichlorobenzene		99.0	20.7	137.7	5.5	30.0
1,2-Dichlorobenzene		100.1	10.0	166.2	6.4	30.0
1,2,3-Trimethylbenzene		102.4	76.3	124.2	5.1	30.0
n-Butylbenzene		107.0	80.0	133.3	5.0	30.0
Hexachloroethane		104.0	23.8	138.1	5.0	30.0
1,2-Dibromo-3-chloropropane		109.8	21.2	189.4	9.2	30.0
1,2,4-Trichlorobenzene		109.0	27.4	143.4	7.3	30.0
1,2,3-Trichlorobenzene		106.6	75.4	131.4	6.9	30.0
Naphthalene		115.0	32.9	135.8	7.4	30.0
2-Methylnaphthalene		106.4	25.5	165.5	8.2	30.0

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		85.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.3	70.0	130.0	12.4	30.0

Merit Laboratories, Inc.

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Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124704

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 994 2240 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Michael.spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / Racer Lansing - Plant 6
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake P. Sarchewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	SM5030C/8260C VOC's	8260B SIM 1,4-Dioxane	SM3030B/6020B metals*	SM8270D SVOC's	Special Instructions
144561.01	6.2.20	1100	EB-04_060220	L	3		3						X				* Select metals -
.02	6.2.20	1310	MWBP-12-UST1-4_060220	GW	5	1	3	1						X	X	X	As, Ni, Pb, V, Cr, Cu
.03	6.2.20	1315	EB-03_060220	L	3		3						X				
.04	6.2.20	1405	MWBP-11-UST1-4_060220	GW	4		3	1						X	X		
.05	6.2.20	1520	MW-14-606_060220	GW	1			1							X		
.06	6.2.20	1330	MW-04-01(16)	GW	3		3							X			
.07	6.2.20	1510	MW-03-06	GW	3		3						X	X			
.08	6/2/20	—	Trip Blank	GW	1								X				

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 6.2.20	TIME	
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 6/2/20	TIME 16:30	
RELINQUISHED BY: SIGNATURE/ORGANIZATION David Stoddard Arcadis		DATE 6/3/20	TIME 8:15	
RECEIVED BY: SIGNATURE/ORGANIZATION Merit Dropbox		DATE 6/3/20	TIME 8:15	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 6/2/2020	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Chicato	DATE 6/2/2020	TIME 0815

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5 18 12

Quality Control Report

Report ID: QC-S14457-01
Generated on 06/15/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14457.01-S14457.03
Project: RACER Lansing
Submitted Date/Time: 06/03/2020 08:15
Sampled by: Daniel Stockard
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-4)
Prep Batch Summary (Page 5)
Surrogates per Lab Sample (Pages 6-8)
Surrogates per QC Sample (Pages 9-12)
Batch QC Results (Pages 13-27)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S14457.01
Sample Tag: MW-14-61_060220
Collected Date/Time: 06/02/2020 13:00
Matrix: Groundwater
COC Reference: 124713

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	06/03/20 10:34	NTRA200603-W1-B	NTRA200603-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	06/08/20 19:20	TKN200608QC	TKN200608QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	06/04/20 19:32	PHS200604QC	PHS200604QC	No	BLK/LCS/MS/DUP
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/08/20 19:25	P200608B	SF200605W02	Yes	BLK/LCS/LCSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 13:32	200610A9	VS200610W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 20:16	200604A7	VF200604W2	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14457.02
Sample Tag: MW-15-72_060220
Collected Date/Time: 06/02/2020 16:10
Matrix: Groundwater
COC Reference: 124713

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/08/20 19:56	P200608B	SF200605W02	Yes	BLK/LCS/LCSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 18:07	200611A9	VS200611W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 20:35	200604A7	VF200604W2	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14457.03
Sample Tag: TW-15-12_060220
Collected Date/Time: 06/02/2020 18:15
Matrix: Groundwater
COC Reference: 124713

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	06/03/20 10:47	NTRA200603-W1-B	NTRA200603-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	06/08/20 20:51	TKN200608QC	TKN200608QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	06/04/20 19:40	PHS200604QC	PHS200604QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 18:29	200611A9	VS200611W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: NTRA200603-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14457.01	Nitrate-N	E300.0	06/03/20 10:34	NTRA200603-W1-B
S14457.03	Nitrate-N	E300.0	06/03/20 10:47	NTRA200603-W1-B

Inorganics, Prep Batch ID: PHS200604QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14457.01	Total Phosphorus	SM4500-PE	06/04/20 19:32	PHS200604QC
S14457.03	Total Phosphorus	SM4500-PE	06/04/20 19:40	PHS200604QC

Inorganics, Prep Batch ID: TKN200608QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14457.01	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	06/08/20 19:20	TKN200608QC
S14457.03	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	06/08/20 20:51	TKN200608QC

Organics - Semi-Volatiles, Prep Batch ID: SF200605W02

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14457.01	Semi-Volatile Organics - MDEQ	SW8270D	06/08/20 19:25	P200608B
S14457.02	Semi-Volatile Organics - MDEQ	SW8270D	06/08/20 19:56	P200608B

Organics - Volatiles, Prep Batch ID: VF200604W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14457.01	Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 20:16	200604A7
S14457.02	Volatile Organics - DEQ List	SW5030C/8260C	06/04/20 20:35	200604A7

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14457.01	1,4-Dioxane	SW8260B - SIM	06/10/20 13:32	200610A9

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14457.02	1,4-Dioxane	SW8260B - SIM	06/11/20 18:07	200611A9
S14457.03	1,4-Dioxane	SW8260B - SIM	06/11/20 18:29	200611A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14457.01

Sample Tag: MW-14-61_060220

Collected Date/Time: 06/02/2020 13:00

Matrix: Groundwater

COC Reference: 124713

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200608B, Run Date: 06/08/2020 19:25, Matrix: WW, Dilution: 2

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**43.50**	10.0	110.0
2-Fluorobiphenyl		**81.30**	10.0	116.0
Nitrobenzene-D5		**73.30**	10.0	114.0
Phenol-D5		**31.10**	10.0	110.0
2,4,6-Tribromophenol		**79.70**	10.0	123.0
Terphenyl-D14		**84.40**	10.0	141.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 13:32, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604A7, Run Date: 06/04/2020 20:16, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.8**	80.0	124.0
1,2-Dichloroethane-D4		**103.1**	72.0	125.0
Toluene-D8		**99.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14457.02

Sample Tag: MW-15-72_060220

Collected Date/Time: 06/02/2020 16:10

Matrix: Groundwater

COC Reference: 124713

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200608B, Run Date: 06/08/2020 19:56, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**33.70**	10.0	110.0
2-Fluorobiphenyl		**65.00**	10.0	116.0
Nitrobenzene-D5		**56.80**	10.0	114.0
Phenol-D5		**23.10**	10.0	110.0
2,4,6-Tribromophenol		**62.10**	10.0	123.0
Terphenyl-D14		**66.60**	10.0	141.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 18:07, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604A7, Run Date: 06/04/2020 20:35, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.1**	80.0	124.0
1,2-Dichloroethane-D4		**101.6**	72.0	125.0
Toluene-D8		**101.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14457.03

Sample Tag: TW-15-12_060220

Collected Date/Time: 06/02/2020 18:15

Matrix: Groundwater

COC Reference: 124713

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 18:29, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Semi-Volatiles, Prep Batch ID: SF200605W02

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: p200608.blkw05b

Run in Batch: P200608, Run Date: 06/08/2020 15:59, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Blank (BLK)

Lab Sample ID: p200608b.blkw05b

Run in Batch: P200608B, Run Date: 06/08/2020 17:53, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**43.30**	10.0	110.0
2-Fluorobiphenyl		**80.00**	10.0	116.0
Nitrobenzene-D5		**76.00**	10.0	114.0
Phenol-D5		**29.70**	10.0	110.0
2,4,6-Tribromophenol		**77.90**	10.0	123.0
Terphenyl-D14		**79.70**	10.0	141.0

Laboratory Control Sample (LCS)

Lab Sample ID: p200608b.lcsw05b

Run in Batch: P200608B, Run Date: 06/08/2020 18:24, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**46.90**	10.0	110.0
2-Fluorobiphenyl		**83.10**	10.0	116.0
Nitrobenzene-D5		**77.00**	10.0	114.0
Phenol-D5		**34.30**	10.0	110.0
2,4,6-Tribromophenol		**86.40**	10.0	123.0
Terphenyl-D14		**82.80**	10.0	141.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: p200608b.lcsdw05b, Parent Sample ID: p200608b.lcsw05b

Run in Batch: P200608B, Run Date: 06/08/2020 18:54, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**49.10**	10.0	110.0
2-Fluorobiphenyl		**83.10**	10.0	116.0
Nitrobenzene-D5		**78.40**	10.0	114.0
Phenol-D5		**35.80**	10.0	110.0
2,4,6-Tribromophenol		**88.90**	10.0	123.0
Terphenyl-D14		**82.40**	10.0	141.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF200604W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200604A7.BLKW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 10:48, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**101.5**	80.0	124.0
1,2-Dichloroethane-D4		**98.7**	72.0	125.0
Toluene-D8		**98.5**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**102.7**	80.0	124.0
1,2-Dichloroethane-D4		**99.4**	72.0	125.0
Toluene-D8		**99.8**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200604A7.LCSDW04A, Parent Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:50, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**102.3**	80.0	124.0
1,2-Dichloroethane-D4		**97.4**	72.0	125.0
Toluene-D8		**100.5**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200610W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200611W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Inorganics, Prep Batch ID: NTRA200603-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA200603-W1-B.LRB1

Run in Batch: NTRA200603-W1-B, Run Date: 06/03/2020 08:39, Prep Date: 06/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA200603-W1-B.LCS1

Run in Batch: NTRA200603-W1-B, Run Date: 06/03/2020 09:04, Prep Date: 06/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		97	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA200603-W1-B.MS1, Parent Sample ID: S14400.01

Run in Batch: NTRA200603-W1-B, Run Date: 06/03/2020 11:13, Prep Date: 06/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		100	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA200603-W1-B.MSD1, Parent Sample ID: NTRA200603-W1-B.MS1

Run in Batch: NTRA200603-W1-B, Run Date: 06/03/2020 11:25, Prep Date: 06/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		100	80	120	0	15

Duplicate (DUP)

Lab Sample ID: NTRA200603-W1-B.DP1, Parent Sample ID: S14400.01

Run in Batch: NTRA200603-W1-B, Run Date: 06/03/2020 11:00, Prep Date: 06/03/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	RPD	RPD CL
Nitrate-N		<1	15

Inorganics, Prep Batch ID: PHS200604QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS200604QC.LRB1

Run in Batch: PHS200604QC, Run Date: 06/04/2020 11:31, Prep Date: 06/04/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS200604QC.LRB2

Run in Batch: PHS200604QC, Run Date: 06/04/2020 11:43, Prep Date: 06/04/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS200604QC.LCS1

Run in Batch: PHS200604QC, Run Date: 06/04/2020 11:49, Prep Date: 06/04/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		91	90	110

Matrix Spike (MS)

Lab Sample ID: PHS200604QC.MS1, Parent Sample ID: S14327.01

Run in Batch: PHS200604QC, Run Date: 06/04/2020 19:51, Prep Date: 06/04/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		88	80	120

Duplicate (DUP)

Lab Sample ID: PHS200604QC.DP1, Parent Sample ID: S14407.01

Run in Batch: PHS200604QC, Run Date: 06/04/2020 19:46, Prep Date: 06/04/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		4.2	20

Inorganics, Prep Batch ID: TKN200608QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN200608QC.LRB1

Run in Batch: TKN200608QC, Run Date: 06/08/2020 13:55, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.02	mg/L

Blank (BLK)

Lab Sample ID: TKN200608QC.LRB2

Run in Batch: TKN200608QC, Run Date: 06/08/2020 15:59, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN200608QC.LCS1

Run in Batch: TKN200608QC, Run Date: 06/08/2020 16:20, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		94	90	110

Matrix Spike (MS)

Lab Sample ID: TKN200608QC.MS1, Parent Sample ID: S14499.02

Run in Batch: TKN200608QC, Run Date: 06/08/2020 16:57, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		101	80	120

Duplicate (DUP)

Lab Sample ID: TKN200608QC.DP1, Parent Sample ID: S14499.01

Run in Batch: TKN200608QC, Run Date: 06/08/2020 16:39, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		5.4	20

Organics - Semi-Volatiles, Prep Batch ID: SF200605W02

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

Blank (BLK)

Lab Sample ID: p200608.blkw05b

Run in Batch: P200608, Run Date: 06/08/2020 15:59, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Benzo(a)pyrene	*	0.1	0.01	ug/l
Hexachlorobenzene		ND	0.01	ug/l
Hexachlorobutadiene		ND	0.01	ug/l
Hexachlorocyclopentadiene		ND	0.01	ug/l

Blank (BLK)

Lab Sample ID: p200608b.blkw05b

Run in Batch: P200608B, Run Date: 06/08/2020 17:53, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acenaphthene		ND	0.5	ug/l
Acenaphthylene		ND	0.5	ug/l
Anthracene		ND	0.5	ug/l
Benzo(a)anthracene		ND	0.5	ug/l
Benzo(b)fluoranthene		ND	0.5	ug/l
Benzo(k)fluoranthene		ND	0.5	ug/l
Benzo(ghi)perylene		ND	0.5	ug/l
Benzo(a)pyrene		ND	0.5	ug/l
bis(2-Chloroethoxy)methane		ND	0.5	ug/l
bis(2-Chloroethyl)ether		ND	0.5	ug/l
bis(2-Chloroisopropyl)ether		ND	0.5	ug/l
bis(2-Ethylhexyl)phthalate		ND	0.5	ug/l
4-Bromophenyl phenyl ether		ND	0.5	ug/l
Butyl benzyl phthalate		ND	0.5	ug/l
4-Chloroaniline		ND	0.5	ug/l
2-Chloronaphthalene		ND	0.5	ug/l
4-Chloro-3-methylphenol		ND	0.5	ug/l
2-Chlorophenol		ND	0.5	ug/l
4-Chlorophenyl phenyl ether		ND	0.5	ug/l
Chrysene		ND	0.5	ug/l
3-, 4-Methylphenol (p,m-Cresol)		ND	1	ug/l
Dibenzo(ah)anthracene		ND	0.5	ug/l
Dibenzofuran		ND	0.5	ug/l
di-n-Butyl phthalate		ND	0.5	ug/l
1,2-Dichlorobenzene		ND	0.5	ug/l
1,3-Dichlorobenzene		ND	0.5	ug/l
1,4-Dichlorobenzene		ND	0.5	ug/l
3,3'-Dichlorobenzidine		ND	0.5	ug/l
2,4-Dichlorophenol		ND	0.5	ug/l
Diethyl phthalate		ND	0.5	ug/l
2,4-Dimethylphenol		ND	0.5	ug/l
Dimethyl phthalate		ND	0.5	ug/l
4,6-Dinitro-2-methylphenol		ND	0.5	ug/l
2,4-Dinitrophenol		ND	0.5	ug/l
2,4-Dinitrotoluene		ND	0.5	ug/l
2,6-Dinitrotoluene		ND	0.5	ug/l
1,2-Diphenylhydrazine		ND	0.5	ug/l

Organics - Semi-Volatiles, Prep Batch ID: SF200605W02 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: p200608b.blkw05b

Run in Batch: P200608B, Run Date: 06/08/2020 17:53, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
di-n-Octyl phthalate		ND	0.5	ug/l
Fluoranthene		ND	0.5	ug/l
Fluorene		ND	0.5	ug/l
Hexachlorobenzene		ND	0.5	ug/l
Hexachlorobutadiene		ND	0.5	ug/l
Hexachlorocyclopentadiene		ND	0.5	ug/l
Hexachloroethane		ND	0.5	ug/l
Indeno(1,2,3-cd)pyrene		ND	0.5	ug/l
Isophorone		ND	0.5	ug/l
2-Methylnaphthalene		ND	0.5	ug/l
Naphthalene		ND	0.5	ug/l
2-Nitroaniline		ND	0.5	ug/l
3-Nitroaniline		ND	0.5	ug/l
4-Nitroaniline		ND	0.5	ug/l
Nitrobenzene		ND	0.5	ug/l
2-Nitrophenol		ND	0.5	ug/l
4-Nitrophenol		ND	0.5	ug/l
N-Nitrosodiphenylamine		ND	0.5	ug/l
N-Nitrosodi-n-propylamine		ND	0.5	ug/l
Pentachlorophenol		ND	0.5	ug/l
Phenanthrene		ND	0.5	ug/l
Phenol		ND	0.5	ug/l
Pyrene		ND	0.5	ug/l
1,2,4-Trichlorobenzene		ND	0.5	ug/l
2,4,5-Trichlorophenol		ND	0.5	ug/l
2,4,6-Trichlorophenol		ND	0.5	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: p200608b.lcsw05b

Run in Batch: P200608B, Run Date: 06/08/2020 18:24, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		84.66	34.8	124.7
Acenaphthylene		89.24	16.9	140.7
Anthracene		86.22	38.1	115.5
Benzo(a)anthracene		94.22	40.7	115.5
Benzo(b)fluoranthene		104.54	43.3	119.4
Benzo(k)fluoranthene		93.44	41.2	116.9
Benzo(ghi)perylene		100.78	36.7	122.1
Benzo(a)pyrene		97.18	51.2	133.4
bis(2-Chloroethoxy)methane		82.26	48.3	105.4
bis(2-Chloroethyl)ether		70.58	43.4	101.8
bis(2-Chloroisopropyl)ether		60.84	33.2	105.8
bis(2-Ethylhexyl)phthalate		87.02	45.2	126.2
4-Bromophenyl phenyl ether		86.80	44.5	116.9
Butyl benzyl phthalate		86.38	47.4	121.6
4-Chloroaniline		67.40	33.4	89.4

Organics - Semi-Volatiles, Prep Batch ID: SF200605W02 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: p200608b.lcsw05b

Run in Batch: P200608B, Run Date: 06/08/2020 18:24, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Chloronaphthalene		82.34	50.3	108.3
4-Chloro-3-methylphenol		81.60	39.0	123.2
2-Chlorophenol		75.00	35.5	114.1
4-Chlorophenyl phenyl ether		86.86	52.2	116.5
Chrysene		91.00	28.9	136.7
3-, 4-Methylphenol (p,m-Cresol)		59.21	36.4	115.4
Dibenzo(ah)anthracene		93.08	33.8	132.4
Dibenzofuran		86.78	52.1	111.9
di-n-Butyl phthalate		89.04	48.1	121.8
1,2-Dichlorobenzene		64.56	9.6	166.2
1,3-Dichlorobenzene		63.18	36.8	105.8
1,4-Dichlorobenzene		62.34	20.7	137.7
3,3'-Dichlorobenzidine		80.18	26.1	103.7
2,4-Dichlorophenol		85.08	57.7	115.6
Diethyl phthalate		88.38	48.1	118.0
2,4-Dimethylphenol		82.78	43.4	114.9
Dimethyl phthalate		87.96	49.3	118.4
4,6-Dinitro-2-methylphenol		83.16	18.7	149.0
2,4-Dinitrophenol		85.26	10.0	171.2
2,4-Dinitrotoluene		89.06	35.8	126.7
2,6-Dinitrotoluene		89.06	48.0	119.1
1,2-Diphenylhydrazine		82.06	40.2	136.4
di-n-Octyl phthalate		100.52	45.7	123.1
Fluoranthene		89.48	43.0	127.9
Fluorene		87.90	37.1	110.3
Hexachlorobenzene		84.54	45.2	118.5
Hexachlorobutadiene		68.82	30.2	119.4
Hexachlorocyclopentadiene		68.38	10.0	271.8
Hexachloroethane		58.04	23.8	138.1
Indeno(1,2,3-cd)pyrene		99.82	41.5	116.9
Isophorone		83.62	44.9	107.5
2-Methylnaphthalene		76.92	25.5	165.5
Naphthalene		74.28	32.9	135.8
2-Nitroaniline		85.88	53.4	119.9
3-Nitroaniline		71.42	42.1	109.0
4-Nitroaniline		83.30	45.8	119.7
Nitrobenzene		72.72	41.7	110.1
2-Nitrophenol		80.32	54.4	109.5
4-Nitrophenol		53.00	15.4	122.0
N-Nitrosodiphenylamine		85.54	10.0	104.2
N-Nitrosodi-n-propylamine		73.74	35.8	109.3
Pentachlorophenol		75.26	10.3	139.1
Phenanthrene		84.14	31.8	123.3
Phenol		36.56	10.0	130.4
Pyrene		94.34	37.8	131.4
1,2,4-Trichlorobenzene		72.68	32.2	118.4

Organics - Semi-Volatiles, Prep Batch ID: SF200605W02 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: p200608b.lcsw05b

Run in Batch: P200608B, Run Date: 06/08/2020 18:24, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2,4,5-Trichlorophenol		90.18	48.9	118.8
2,4,6-Trichlorophenol		85.92	47.8	117.4

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: p200608b.lcsdw05b, Parent Sample ID: p200608b.lcsw05b

Run in Batch: P200608B, Run Date: 06/08/2020 18:54, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		84.94	34.8	124.7	0.3	30.0
Acenaphthylene		88.36	16.9	140.7	1.0	30.0
Anthracene		87.18	38.1	115.5	1.1	30.0
Benzo(a)anthracene		88.04	40.7	115.5	6.8	30.0
Benzo(b)fluoranthene		108.26	43.3	119.4	3.5	30.0
Benzo(k)fluoranthene		98.60	41.2	116.9	5.4	30.0
Benzo(ghi)perylene		103.64	36.7	122.1	2.8	30.0
Benzo(a)pyrene		103.88	51.2	133.4	6.7	30.0
bis(2-Chloroethoxy)methane		83.72	48.3	105.4	1.8	30.0
bis(2-Chloroethyl)ether		73.04	43.4	101.8	3.4	30.0
bis(2-Chloroisopropyl)ether		62.76	33.2	105.8	3.1	30.0
bis(2-Ethylhexyl)phthalate		80.42	45.2	126.2	7.9	30.0
4-Bromophenyl phenyl ether		86.78	44.5	116.9	0.0	30.0
Butyl benzyl phthalate		81.58	47.4	121.6	5.7	30.0
4-Chloroaniline		66.10	33.4	89.4	1.9	30.0
2-Chloronaphthalene		81.28	50.3	108.3	1.3	30.0
4-Chloro-3-methylphenol		80.48	39.0	123.2	1.4	30.0
2-Chlorophenol		77.36	35.5	114.1	3.1	30.0
4-Chlorophenyl phenyl ether		83.90	52.2	116.5	3.5	30.0
Chrysene		88.00	28.9	136.7	3.4	30.0
3-, 4-Methylphenol (p,m-Cresol)		60.45	36.4	115.4	2.1	30.0
Dibenzo(ah)anthracene		96.56	33.8	132.4	3.7	30.0
Dibenzofuran		86.28	52.1	111.9	0.6	30.0
di-n-Butyl phthalate		87.60	48.1	121.8	1.6	30.0
1,2-Dichlorobenzene		65.82	9.6	166.2	1.9	30.0
1,3-Dichlorobenzene		63.68	36.8	105.8	0.8	30.0
1,4-Dichlorobenzene		64.08	20.7	137.7	2.8	30.0
3,3'-Dichlorobenzidine		77.94	26.1	103.7	2.8	30.0
2,4-Dichlorophenol		83.96	57.7	115.6	1.3	30.0
Diethyl phthalate		87.30	48.1	118.0	1.2	30.0
2,4-Dimethylphenol		82.62	43.4	114.9	0.2	30.0
Dimethyl phthalate		87.72	49.3	118.4	0.3	30.0
4,6-Dinitro-2-methylphenol		84.56	18.7	149.0	1.7	30.0
2,4-Dinitrophenol		87.06	10.0	171.2	2.1	30.0
2,4-Dinitrotoluene		88.32	35.8	126.7	0.8	30.0
2,6-Dinitrotoluene		88.44	48.0	119.1	0.7	30.0
1,2-Diphenylhydrazine		82.78	40.2	136.4	0.9	30.0
di-n-Octyl phthalate		103.68	45.7	123.1	3.1	30.0
Fluoranthene		90.54	43.0	127.9	1.2	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF200605W02 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: p200608b.lcsdw05b, Parent Sample ID: p200608b.lcsw05b

Run in Batch: P200608B, Run Date: 06/08/2020 18:54, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Fluorene		87.68	37.1	110.3	0.3	30.0
Hexachlorobenzene		87.90	45.2	118.5	3.9	30.0
Hexachlorobutadiene		69.60	30.2	119.4	1.1	30.0
Hexachlorocyclopentadiene		68.58	10.0	271.8	0.3	30.0
Hexachloroethane		58.68	23.8	138.1	1.1	30.0
Indeno(1,2,3-cd)pyrene		102.08	41.5	116.9	2.2	30.0
Isophorone		84.26	44.9	107.5	0.8	30.0
2-Methylnaphthalene		77.12	25.5	165.5	0.3	30.0
Naphthalene		73.86	32.9	135.8	0.6	30.0
2-Nitroaniline		87.58	53.4	119.9	2.0	30.0
3-Nitroaniline		68.42	42.1	109.0	4.3	30.0
4-Nitroaniline		82.16	45.8	119.7	1.4	30.0
Nitrobenzene		73.36	41.7	110.1	0.9	30.0
2-Nitrophenol		81.08	54.4	109.5	0.9	30.0
4-Nitrophenol		52.90	15.4	122.0	0.2	30.0
N-Nitrosodiphenylamine		86.56	10.0	104.2	1.2	30.0
N-Nitrosodi-n-propylamine		76.34	35.8	109.3	3.5	30.0
Pentachlorophenol		78.82	10.3	139.1	4.6	30.0
Phenanthrene		83.24	31.8	123.3	1.1	30.0
Phenol		38.04	10.0	130.4	4.0	30.0
Pyrene		88.26	37.8	131.4	6.7	30.0
1,2,4-Trichlorobenzene		74.84	32.2	118.4	2.9	30.0
2,4,5-Trichlorophenol		90.58	48.9	118.8	0.4	30.0
2,4,6-Trichlorophenol		84.78	47.8	117.4	1.3	30.0

Organics - Volatiles, Prep Batch ID: VF200604W2

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

Blank (BLK)

Lab Sample ID: 200604A7.BLKW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 10:48, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200604W2 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200604A7.BLKW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 10:48, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		104.2	67.4	121.2
Acetone		122.4	29.9	161.5
Methyl iodide		107.2	68.8	116.4
Carbon disulfide		103.9	63.8	137.4
tert-Methyl butyl ether (MTBE)		100.5	73.2	122.4
Acrylonitrile		100.9	69.9	128.9
2-Butanone (MEK)		101.6	44.0	134.4
Dichlorodifluoromethane		117.1	10.0	222.8
Chloromethane		108.0	23.8	166.5
Vinyl chloride		107.4	43.5	149.1
Bromomethane		113.9	56.8	151.3
Chloroethane		104.7	53.4	149.4
Trichlorofluoromethane		103.8	59.7	151.8
1,1-Dichloroethene		105.5	69.6	139.4
Methylene chloride		98.6	73.3	121.1
trans-1,2-Dichloroethene		104.0	73.6	129.3
1,1-Dichloroethane		104.8	71.5	126.2
cis-1,2-Dichloroethene		103.3	76.6	122.1
Tetrahydrofuran		103.3	59.0	117.9
Chloroform		104.5	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200604W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		105.0	78.2	120.8
1,1,1-Trichloroethane		104.9	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.4	71.6	125.2
2-Hexanone		100.5	55.4	136.9
Carbon tetrachloride		106.7	72.6	133.0
Benzene		104.4	79.9	124.9
1,2-Dichloroethane		101.6	76.0	126.3
Trichloroethene		104.0	79.7	124.2
1,2-Dichloropropane		104.8	78.6	126.4
Bromodichloromethane		106.8	80.4	128.2
Dibromomethane		105.9	76.9	122.1
cis-1,3-Dichloropropene		107.5	79.8	129.9
Toluene		104.8	79.8	124.5
trans-1,3-Dichloropropene		108.2	74.0	131.3
1,1,2-Trichloroethane		104.5	78.7	123.1
Tetrachloroethene		100.9	74.5	124.5
trans-1,4-Dichloro-2-butene		107.2	68.6	135.4
Dibromochloromethane		107.3	74.6	127.2
1,2-Dibromoethane		105.4	70.3	133.7
Chlorobenzene		105.7	79.2	122.7
1,1,1,2-Tetrachloroethane		106.8	80.3	128.2
Ethylbenzene		106.5	79.5	129.1
p,m-Xylene		105.0	79.4	132.2
o-Xylene		105.3	80.2	131.0
Styrene		107.5	69.5	126.7
Isopropylbenzene		108.1	74.4	121.5
Bromoform		107.4	69.4	128.0
1,1,2,2-Tetrachloroethane		103.9	79.8	126.3
1,2,3-Trichloropropane		106.1	78.3	138.8
n-Propylbenzene		108.2	82.0	130.7
Bromobenzene		105.2	78.7	124.6
1,3,5-Trimethylbenzene		105.7	81.3	128.9
tert-Butylbenzene		106.1	80.7	128.9
1,2,4-Trimethylbenzene		106.0	81.4	130.8
sec-Butylbenzene		105.8	77.4	129.8
p-Isopropyltoluene		106.4	79.8	137.5
1,3-Dichlorobenzene		105.4	77.0	131.3
1,4-Dichlorobenzene		104.1	20.7	137.7
1,2-Dichlorobenzene		105.8	10.0	166.2
1,2,3-Trimethylbenzene		102.1	76.3	124.2
n-Butylbenzene		104.9	80.0	133.3
Hexachloroethane		104.5	23.8	138.1
1,2-Dibromo-3-chloropropane		103.8	21.2	189.4
1,2,4-Trichlorobenzene		106.1	27.4	143.4
1,2,3-Trichlorobenzene		105.8	75.4	131.4
Naphthalene		103.4	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200604W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		102.2	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200604A7.LCSDW04A, Parent Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:50, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		93.5	67.4	121.2	10.8	30.0
Acetone		113.5	29.9	161.5	7.5	30.0
Methyl iodide		98.0	68.8	116.4	9.0	30.0
Carbon disulfide		95.9	63.8	137.4	8.0	30.0
tert-Methyl butyl ether (MTBE)		90.6	73.2	122.4	10.3	30.0
Acrylonitrile		92.4	69.9	128.9	8.8	30.0
2-Butanone (MEK)		95.6	44.0	134.4	6.0	30.0
Dichlorodifluoromethane		111.0	10.0	222.8	5.4	30.0
Chloromethane		99.6	23.8	166.5	8.1	30.0
Vinyl chloride		100.6	43.5	149.1	6.6	30.0
Bromomethane		104.0	56.8	151.3	9.1	30.0
Chloroethane		97.0	53.4	149.4	7.7	30.0
Trichlorofluoromethane		96.6	59.7	151.8	7.1	30.0
1,1-Dichloroethene		98.7	69.6	139.4	6.7	30.0
Methylene chloride		89.4	73.3	121.1	9.8	30.0
trans-1,2-Dichloroethene		95.9	73.6	129.3	8.2	30.0
1,1-Dichloroethane		96.0	71.5	126.2	8.7	30.0
cis-1,2-Dichloroethene		93.1	76.6	122.1	10.4	30.0
Tetrahydrofuran		96.0	59.0	117.9	7.4	30.0
Chloroform		94.8	78.4	124.0	9.7	30.0
Bromochloromethane		95.2	78.2	120.8	9.8	30.0
1,1,1-Trichloroethane		96.7	79.4	130.9	8.2	30.0
4-Methyl-2-pentanone (MIBK)		91.1	71.6	125.2	7.6	30.0
2-Hexanone		94.7	55.4	136.9	5.9	30.0
Carbon tetrachloride		98.2	72.6	133.0	8.3	30.0
Benzene		95.5	79.9	124.9	8.9	30.0
1,2-Dichloroethane		93.2	76.0	126.3	8.7	30.0
Trichloroethene		96.4	79.7	124.2	7.6	30.0
1,2-Dichloropropane		97.0	78.6	126.4	7.8	30.0
Bromodichloromethane		96.5	80.4	128.2	10.1	30.0
Dibromomethane		96.9	76.9	122.1	8.9	30.0
cis-1,3-Dichloropropene		98.2	79.8	129.9	9.1	30.0
Toluene		97.2	79.8	124.5	7.4	30.0
trans-1,3-Dichloropropene		99.0	74.0	131.3	8.9	30.0
1,1,2-Trichloroethane		95.7	78.7	123.1	8.8	30.0
Tetrachloroethene		93.3	74.5	124.5	7.8	30.0
trans-1,4-Dichloro-2-butene		96.6	68.6	135.4	10.3	30.0
Dibromochloromethane		98.0	74.6	127.2	9.1	30.0
1,2-Dibromoethane		97.7	70.3	133.7	7.6	30.0
Chlorobenzene		96.5	79.2	122.7	9.1	30.0

Organics - Volatiles, Prep Batch ID: VF200604W2 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200604A7.LCSDW04A, Parent Sample ID: 200604A7.LCSW04A

Run in Batch: 200604A7, Run Date: 06/04/2020 09:50, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		96.0	80.3	128.2	10.7	30.0
Ethylbenzene		97.4	79.5	129.1	8.9	30.0
p,m-Xylene		96.4	79.4	132.2	8.6	30.0
o-Xylene		95.9	80.2	131.0	9.3	30.0
Styrene		97.1	69.5	126.7	10.1	30.0
Isopropylbenzene		97.8	74.4	121.5	10.1	30.0
Bromoform		98.3	69.4	128.0	8.8	30.0
1,1,2,2-Tetrachloroethane		95.2	79.8	126.3	8.7	30.0
1,2,3-Trichloropropane		95.8	78.3	138.8	10.2	30.0
n-Propylbenzene		99.0	82.0	130.7	8.8	30.0
Bromobenzene		95.0	78.7	124.6	10.1	30.0
1,3,5-Trimethylbenzene		97.2	81.3	128.9	8.3	30.0
tert-Butylbenzene		97.0	80.7	128.9	8.9	30.0
1,2,4-Trimethylbenzene		96.9	81.4	130.8	9.0	30.0
sec-Butylbenzene		97.6	77.4	129.8	8.1	30.0
p-Isopropyltoluene		97.9	79.8	137.5	8.3	30.0
1,3-Dichlorobenzene		94.5	77.0	131.3	10.9	30.0
1,4-Dichlorobenzene		95.0	20.7	137.7	9.2	30.0
1,2-Dichlorobenzene		95.8	10.0	166.2	9.9	30.0
1,2,3-Trimethylbenzene		91.0	76.3	124.2	11.5	30.0
n-Butylbenzene		96.5	80.0	133.3	8.3	30.0
Hexachloroethane		94.1	23.8	138.1	10.5	30.0
1,2-Dibromo-3-chloropropane		93.9	21.2	189.4	10.0	30.0
1,2,4-Trichlorobenzene		95.7	27.4	143.4	10.3	30.0
1,2,3-Trichlorobenzene		95.0	75.4	131.4	10.7	30.0
Naphthalene		93.2	32.9	135.8	10.4	30.0
2-Methylnaphthalene		94.2	25.5	165.5	8.2	30.0

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		85.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.3	70.0	130.0	12.4	30.0

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.4	70.0	130.0	10.8	30.0

Merit Laboratories, Inc.

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www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124713

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil & Dan Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. #500
CITY: Novi STATE: MI ZIP CODE: 98377
PHONE NO.: FAX NO.: P.O. NO.: 30042872
E-MAIL ADDRESS: mike.spacil@arcadis.com daniel.stockard@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Daniel Stockard

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO3	H2SO4	NaOH	MeOH	OTHER	VOCs 8260C/5035QC	SVOCs SM8270D	1,4-Dioxane 8260B SIMS	Nitrate E300	TKN 4500-Norg/NH3	TP SM4500-P E
14457.01	6/1/20	13:00	MW-14-61_060220	GW	6	1	3		1				X	X	X	X	X	X
.02	6/2/20	16:10	MW-15-72-060220	GW	4	1	3						X	X	X			
.03	6/2/20	18:15	TW-15-12_060220	GW	5	1	3		1						X	X	X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Daniel Stockard ☒ Sampler DATE: 6/3/20 TIME: 8:15
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Dropbox DATE: 6/3/20 TIME: 8:15

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box DATE: 6/2/2020 TIME: 0815
RECEIVED BY: SIGNATURE/ORGANIZATION: M Chilcott DATE: 6/2/2020 TIME: 0815

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO.: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO.: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL: 4.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Quality Control Report

Report ID: QC-S14507-02
Generated on 07/07/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
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Report Summary

Lab Sample ID(s): S14507.01-S14507.08
Project: 30042872 / RACER Lansing - Plant 6
Submitted Date/Time: 06/04/2020 08:15
Sampled by: Jake Pisarkiewicz / Jessica F
P.O. #: 30042872

QC Report Sections

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Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S14507.01
Sample Tag: MW-04-06R_060320
Collected Date/Time: 06/03/2020 11:00
Matrix: Groundwater
COC Reference: 124705

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 12:56	200611A9	VS200611W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14507.02
Sample Tag: MW-04-04R_060320
Collected Date/Time: 06/03/2020 12:20
Matrix: Groundwater
COC Reference: 124705

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 15:01	200610A9	VS200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14507.03

Sample Tag: DUP-11_060320

Collected Date/Time: 06/03/2020 12:00

Matrix: Groundwater

COC Reference: 124705

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 15:23	200610A9	VS200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14507.04

Sample Tag: MW-03-08_060320

Collected Date/Time: 06/03/2020 15:30

Matrix: Groundwater

COC Reference: 124705

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 05:18	200604B7	VF200604W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14507.05

Sample Tag: MW-02-03(6)_060320

Collected Date/Time: 06/03/2020 12:35

Matrix: Groundwater

COC Reference: 124705

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/10/20 19:58	P200610	SF200608W01	Yes	BLK/LCS/LCSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 15:45	200610A9	VS200610W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 05:37	200604B7	VF200604W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14507.06

Sample Tag: MW-03-05_060320

Collected Date/Time: 06/03/2020 10:25

Matrix: Groundwater

COC Reference: 124705

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 16:07	200610A9	VS200610W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 05:56	200604B7	VF200604W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14507.07

Sample Tag: Trip Blank_060320

Collected Date/Time: 06/03/2020 00:01

Matrix: Water

COC Reference: 124705

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 00:08	200604B7	VF200604W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14507.08

Sample Tag: FB-04_060220

Collected Date/Time: 06/02/2020 00:01

Matrix: Water

COC Reference: 124705

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 00:27	200604B7	VF200604W3	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14507.05	Semi-Volatile Organics - MDEQ	SW8270D	06/10/20 19:58	P200610

Organics - Volatiles, Prep Batch ID: VF200604W3

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14507.04	Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 05:18	200604B7
S14507.05	Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 05:37	200604B7
S14507.06	Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 05:56	200604B7
S14507.07	Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 00:08	200604B7
S14507.08	Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 00:27	200604B7

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14507.02	1,4-Dioxane	SW8260B - SIM	06/10/20 15:01	200610A9
S14507.03	1,4-Dioxane	SW8260B - SIM	06/10/20 15:23	200610A9
S14507.05	1,4-Dioxane	SW8260B - SIM	06/10/20 15:45	200610A9
S14507.06	1,4-Dioxane	SW8260B - SIM	06/10/20 16:07	200610A9

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14507.01	1,4-Dioxane	SW8260B - SIM	06/11/20 12:56	200611A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14507.01

Sample Tag: MW-04-06R_060320

Collected Date/Time: 06/03/2020 11:00

Matrix: Groundwater

COC Reference: 124705

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 12:56, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14507.02

Sample Tag: MW-04-04R_060320

Collected Date/Time: 06/03/2020 12:20

Matrix: Groundwater

COC Reference: 124705

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 15:01, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14507.03

Sample Tag: DUP-11_060320

Collected Date/Time: 06/03/2020 12:00

Matrix: Groundwater

COC Reference: 124705

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 15:23, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14507.04

Sample Tag: MW-03-08_060320

Collected Date/Time: 06/03/2020 15:30

Matrix: Groundwater

COC Reference: 124705

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604B7, Run Date: 06/05/2020 05:18, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.1**	80.0	124.0
1,2-Dichloroethane-D4		**103.4**	72.0	125.0
Toluene-D8		**100.5**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14507.05

Sample Tag: MW-02-03(6)_060320

Collected Date/Time: 06/03/2020 12:35

Matrix: Groundwater

COC Reference: 124705

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200610, Run Date: 06/10/2020 19:58, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**32.8**	10.0	110.0
Phenol-D5		**23.6**	10.0	110.0
Nitrobenzene-D5		**56.2**	10.0	114.0
2-Fluorobiphenyl		**60.5**	10.0	116.0
2,4,6-Tribromophenol		**64.5**	10.0	123.0
Terphenyl-D14		**62.9**	10.0	141.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 15:45, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604B7, Run Date: 06/05/2020 05:37, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.6**	80.0	124.0
1,2-Dichloroethane-D4		**103.5**	72.0	125.0
Toluene-D8		**100.2**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14507.06

Sample Tag: MW-03-05_060320

Collected Date/Time: 06/03/2020 10:25

Matrix: Groundwater

COC Reference: 124705

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 16:07, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604B7, Run Date: 06/05/2020 05:56, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.9**	80.0	124.0
1,2-Dichloroethane-D4		**102.7**	72.0	125.0
Toluene-D8		**100.2**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14507.07

Sample Tag: Trip Blank_060320

Collected Date/Time: 06/03/2020 00:01

Matrix: Water

COC Reference: 124705

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604B7, Run Date: 06/05/2020 00:08, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.8**	80.0	124.0
1,2-Dichloroethane-D4		**103.4**	72.0	125.0
Toluene-D8		**100.3**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14507.08

Sample Tag: FB-04_060220

Collected Date/Time: 06/02/2020 00:01

Matrix: Water

COC Reference: 124705

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604B7, Run Date: 06/05/2020 00:27, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.9**	80.0	124.0
1,2-Dichloroethane-D4		**102.5**	72.0	125.0
Toluene-D8		**100.5**	89.0	112.0

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: P200610.BLKW08A

Run in Batch: P200610, Run Date: 06/10/2020 17:55, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**31.3**	10.0	110.0
Phenol-D5		**22.0**	10.0	110.0
Nitrobenzene-D5		**54.1**	10.0	114.0
2-Fluorobiphenyl		**55.0**	10.0	116.0
2,4,6-Tribromophenol		**56.1**	10.0	123.0
Terphenyl-D14		**56.1**	10.0	141.0

Laboratory Control Sample (LCS)

Lab Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 18:56, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**34.4**	10.0	110.0
Phenol-D5		**27.4**	10.0	110.0
Nitrobenzene-D5		**74.4**	10.0	114.0
2-Fluorobiphenyl		**75.7**	10.0	116.0
2,4,6-Tribromophenol		**67.1**	10.0	123.0
Terphenyl-D14		**79.9**	10.0	141.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200610.LCSDW08A, Parent Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 19:27, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**34.0**	10.0	110.0
Phenol-D5		**27.2**	10.0	110.0
Nitrobenzene-D5		**74.6**	10.0	114.0
2-Fluorobiphenyl		**76.1**	10.0	116.0
2,4,6-Tribromophenol		**63.5**	10.0	123.0
Terphenyl-D14		**76.8**	10.0	141.0

Organics - Volatiles, Prep Batch ID: VF200604W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200604B7.BLKW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 23:29, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**103.8**	72.0	125.0
Toluene-D8		**98.9**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:12, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**106.4**	72.0	125.0
Toluene-D8		**100.1**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200604B7.LCSDW04C, Parent Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.7**	80.0	124.0
1,2-Dichloroethane-D4		**107.1**	72.0	125.0
Toluene-D8		**101.2**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200610W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200611W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01

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

Blank (BLK)

Lab Sample ID: P200610.BLKW08A

Run in Batch: P200610, Run Date: 06/10/2020 17:55, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acenaphthene		ND	0.00050	mg/l
Acenaphthylene		ND	0.00050	mg/l
Anthracene		ND	0.00050	mg/l
Benzo(a)anthracene		ND	0.00050	mg/l
Benzo(b)fluoranthene		ND	0.00050	mg/l
Benzo(k)fluoranthene		ND	0.00050	mg/l
Benzo(ghi)perylene		ND	0.00050	mg/l
Benzo(a)pyrene		ND	0.00050	mg/l
bis(2-Chloroethoxy)methane		ND	0.00050	mg/l
bis(2-Chloroethyl)ether		ND	0.00050	mg/l
bis(2-Chloroisopropyl)ether		ND	0.00050	mg/l
bis(2-Ethylhexyl)phthalate		ND	0.00050	mg/l
4-Bromophenyl phenyl ether		ND	0.00050	mg/l
Butyl benzyl phthalate		ND	0.00050	mg/l
4-Chloroaniline		ND	0.00050	mg/l
2-Chloronaphthalene		ND	0.00050	mg/l
4-Chloro-3-methylphenol		ND	0.00050	mg/l
2-Chlorophenol		ND	0.00050	mg/l
4-Chlorophenyl phenyl ether		ND	0.00050	mg/l
Chrysene		ND	0.00050	mg/l
3-, 4-Methylphenol (p,m-Cresol)		ND	0.00100	mg/l
2-Methylphenol (o-Cresol)		ND	0.00050	mg/l
Dibenzo(ah)anthracene		ND	0.00050	mg/l
Dibenzofuran		ND	0.00050	mg/l
di-n-Butyl phthalate		ND	0.00050	mg/l
1,2-Dichlorobenzene		ND	0.00050	mg/l
1,3-Dichlorobenzene		ND	0.00050	mg/l
1,4-Dichlorobenzene		ND	0.00050	mg/l
3,3'-Dichlorobenzidine		ND	0.00050	mg/l
2,4-Dichlorophenol		ND	0.00050	mg/l
Diethyl phthalate		ND	0.00050	mg/l
2,4-Dimethylphenol		ND	0.00050	mg/l
Dimethyl phthalate		ND	0.00050	mg/l
4,6-Dinitro-2-methylphenol		ND	0.00050	mg/l
2,4-Dinitrophenol		ND	0.00050	mg/l
2,4-Dinitrotoluene		ND	0.00050	mg/l
2,6-Dinitrotoluene		ND	0.00050	mg/l
1,2-Diphenylhydrazine		ND	0.00050	mg/l
di-n-Octyl phthalate		ND	0.00050	mg/l
Fluoranthene		ND	0.00050	mg/l
Fluorene		ND	0.00050	mg/l
Hexachlorobenzene		ND	0.00050	mg/l
Hexachlorobutadiene		ND	0.00050	mg/l
Hexachlorocyclopentadiene		ND	0.00050	mg/l
Hexachloroethane		ND	0.00050	mg/l
Indeno(1,2,3-cd)pyrene		ND	0.00050	mg/l

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: P200610.BLKW08A

Run in Batch: P200610, Run Date: 06/10/2020 17:55, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Isophorone		ND	0.00050	mg/l
2-Methylnaphthalene		ND	0.00050	mg/l
Naphthalene		ND	0.00050	mg/l
2-Nitroaniline		ND	0.00050	mg/l
3-Nitroaniline		ND	0.00050	mg/l
4-Nitroaniline		ND	0.00050	mg/l
Nitrobenzene		ND	0.00050	mg/l
2-Nitrophenol		ND	0.00050	mg/l
4-Nitrophenol		ND	0.00050	mg/l
N-Nitrosodiphenylamine		ND	0.00050	mg/l
N-Nitrosodi-n-propylamine		ND	0.00050	mg/l
Pentachlorophenol		ND	0.00050	mg/l
Phenanthrene		ND	0.00050	mg/l
Phenol		ND	0.00050	mg/l
Pyrene		ND	0.00050	mg/l
1,2,4-Trichlorobenzene		ND	0.00050	mg/l
2,4,5-Trichlorophenol		ND	0.00050	mg/l
2,4,6-Trichlorophenol		ND	0.00050	mg/l

Laboratory Control Sample (LCS)

Lab Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 18:56, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		82.9	37.82	102.82
Acenaphthylene		88.3	34.75	114.76
Anthracene		87.4	38.29	107.17
Benzo(a)anthracene		90.0	39.45	103.23
Benzo(b)fluoranthene		94.3	39.3	105.62
Benzo(k)fluoranthene		80.3	37.32	99.27
Benzo(ghi)perylene		93.0	25.65	121.02
Benzo(a)pyrene		88.4	41	102.98
bis(2-Chloroethoxy)methane		83.5	38.96	94.94
bis(2-Chloroethyl)ether		72.0	32.79	92.32
bis(2-Chloroisopropyl)ether		62.4	28.96	95.55
bis(2-Ethylhexyl)phthalate		86.2	43.38	102.89
4-Bromophenyl phenyl ether		92.5	36.32	111.95
Butyl benzyl phthalate		84.5	41.29	98.17
4-Chloroaniline		69.7	11.53	72.6
2-Chloronaphthalene		81.2	36.7	102.59
4-Chloro-3-methylphenol		79.0	39.63	104.28
2-Chlorophenol		65.7	34.18	94.55
4-Chlorophenyl phenyl ether		85.7	38.63	115.88
Chrysene		92.2	42.42	104.5
3-, 4-Methylphenol (p,m-Cresol)		55.6	36.4	115.4
2-Methylphenol (o-Cresol)		67.1	37.3	120.0
Dibenzo(ah)anthracene		84.4	31.37	119.17

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 18:56, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Dibenzofuran		85.5	40.25	104.89
di-n-Butyl phthalate		90.1	42.66	109.16
1,2-Dichlorobenzene		61.4	35.29	149.51
1,3-Dichlorobenzene		58.6	32.15	155.22
1,4-Dichlorobenzene		58.5	33.22	151.25
3,3'-Dichlorobenzidine		79.8	26.1	103.71
2,4-Dichlorophenol		72.8	41.58	98.03
Diethyl phthalate		86.5	43.35	109.88
2,4-Dimethylphenol		82.2	39.69	104.6
Dimethyl phthalate		87.5	44.99	102.98
4,6-Dinitro-2-methylphenol		69.8	19.98	101.32
2,4-Dinitrophenol		60.5	10	109.59
2,4-Dinitrotoluene		86.6	37.33	115.88
2,6-Dinitrotoluene		89.0	41.24	106.63
1,2-Diphenylhydrazine		84.6	39.95	95.79
di-n-Octyl phthalate		87.6	38.19	107.3
Fluoranthene		90.7	39.79	106.64
Fluorene		87.3	36.94	108.4
Hexachlorobenzene		93.6	34.37	118.98
Hexachlorobutadiene		62.3	16.99	122.89
Hexachlorocyclopentadiene		66.1	21.56	132.1
Hexachloroethane		53.2	22.96	157.68
Indeno(1,2,3-cd)pyrene		89.2	29.55	116.59
Isophorone		85.6	33.67	101.86
2-Methylnaphthalene		74.5	29.6	140.3
Naphthalene		72.3	31.37	140.54
2-Nitroaniline		86.5	41.37	98.69
3-Nitroaniline		71.7	22.05	86.36
4-Nitroaniline		80.6	31.15	107.83
Nitrobenzene		74.8	38.21	124.16
2-Nitrophenol		69.1	38.56	92.8
4-Nitrophenol		34.3	13.39	116.72
N-Nitrosodiphenylamine		88.4	33.26	108.23
N-Nitrosodi-n-propylamine		75.7	32.25	95.51
Pentachlorophenol		59.6	17.09	112.61
Phenanthrene		84.8	37.67	105.05
Phenol		30.5	10	103.25
Pyrene		94.0	38.69	102.69
1,2,4-Trichlorobenzene		66.6	39.12	156.7
2,4,5-Trichlorophenol		75.6	38.05	112.24
2,4,6-Trichlorophenol		70.2	38.38	108.99

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200610.LCSDW08A, Parent Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 19:27, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		82.9	37.82	102.82	0.0	30.0
Acenaphthylene		89.0	34.75	114.76	0.8	30.0
Anthracene		86.0	38.29	107.17	1.6	30.0
Benzo(a)anthracene		89.8	39.45	103.23	0.1	30.0
Benzo(b)fluoranthene		92.9	39.3	105.62	1.4	30.0
Benzo(k)fluoranthene		82.4	37.32	99.27	2.5	30.0
Benzo(ghi)perylene		90.5	25.65	121.02	2.8	30.0
Benzo(a)pyrene		87.9	41	102.98	0.6	30.0
bis(2-Chloroethoxy)methane		84.9	38.96	94.94	1.7	30.0
bis(2-Chloroethyl)ether		72.5	32.79	92.32	0.7	30.0
bis(2-Chloroisopropyl)ether		62.3	28.96	95.55	0.2	30.0
bis(2-Ethylhexyl)phthalate		84.3	43.38	102.89	2.2	30.0
4-Bromophenyl phenyl ether		91.6	36.32	111.95	1.0	30.0
Butyl benzyl phthalate		83.0	41.29	98.17	1.8	30.0
4-Chloroaniline		71.4	11.53	72.6	2.4	30.0
2-Chloronaphthalene		79.7	36.7	102.59	1.9	30.0
4-Chloro-3-methylphenol		79.4	39.63	104.28	0.5	30.0
2-Chlorophenol		65.6	34.18	94.55	0.2	30.0
4-Chlorophenyl phenyl ether		84.6	38.63	115.88	1.2	30.0
Chrysene		88.5	42.42	104.5	4.1	30.0
3-, 4-Methylphenol (p,m-Cresol)		55.9	36.4	115.4	0.5	30.0
2-Methylphenol (o-Cresol)		67.3	37.3	120.0	0.4	30.0
Dibenzo(ah)anthracene		83.3	31.37	119.17	1.2	30.0
Dibenzofuran		86.1	40.25	104.89	0.7	30.0
di-n-Butyl phthalate		88.9	42.66	109.16	1.4	30.0
1,2-Dichlorobenzene		61.0	35.29	149.51	0.5	30.0
1,3-Dichlorobenzene		58.2	32.15	155.22	0.7	30.0
1,4-Dichlorobenzene		58.8	33.22	151.25	0.5	30.0
3,3'-Dichlorobenzidine		76.6	26.1	103.71	4.1	30.0
2,4-Dichlorophenol		72.5	41.58	98.03	0.4	30.0
Diethyl phthalate		86.6	43.35	109.88	0.0	30.0
2,4-Dimethylphenol		82.1	39.69	104.6	0.1	30.0
Dimethyl phthalate		86.0	44.99	102.98	1.8	30.0
4,6-Dinitro-2-methylphenol		67.9	19.98	101.32	2.7	30.0
2,4-Dinitrophenol		60.8	10	109.59	0.4	30.0
2,4-Dinitrotoluene		86.6	37.33	115.88	0.0	30.0
2,6-Dinitrotoluene		87.8	41.24	106.63	1.4	30.0
1,2-Diphenylhydrazine		86.6	39.95	95.79	2.4	30.0
di-n-Octyl phthalate		88.7	38.19	107.3	1.2	30.0
Fluoranthene		91.4	39.79	106.64	0.7	30.0
Fluorene		85.7	36.94	108.4	1.9	30.0
Hexachlorobenzene		89.0	34.37	118.98	5.0	30.0
Hexachlorobutadiene		63.5	16.99	122.89	1.8	30.0
Hexachlorocyclopentadiene		64.7	21.56	132.1	2.2	30.0
Hexachloroethane		53.6	22.96	157.68	0.9	30.0
Indeno(1,2,3-cd)pyrene	*	42.1	29.55	116.59	71.7	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: P200610.LCSDW08A, Parent Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 19:27, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isophorone		86.4	33.67	101.86	1.0	30.0
2-Methylnaphthalene		74.0	29.6	140.3	0.7	30.0
Naphthalene		72.2	31.37	140.54	0.1	30.0
2-Nitroaniline		88.9	41.37	98.69	2.6	30.0
3-Nitroaniline		71.8	22.05	86.36	0.1	30.0
4-Nitroaniline		81.2	31.15	107.83	0.8	30.0
Nitrobenzene		75.4	38.21	124.16	0.8	30.0
2-Nitrophenol		68.6	38.56	92.8	0.8	30.0
4-Nitrophenol		35.0	13.39	116.72	2.1	30.0
N-Nitrosodiphenylamine		89.3	33.26	108.23	1.0	30.0
N-Nitrosodi-n-propylamine		77.2	32.25	95.51	2.0	30.0
Pentachlorophenol		59.5	17.09	112.61	0.3	30.0
Phenanthrene		82.9	37.67	105.05	2.3	30.0
Phenol		30.1	10	103.25	1.5	30.0
Pyrene		90.5	38.69	102.69	3.8	30.0
1,2,4-Trichlorobenzene		69.4	39.12	156.7	4.1	30.0
2,4,5-Trichlorophenol		75.7	38.05	112.24	0.1	30.0
2,4,6-Trichlorophenol		69.0	38.38	108.99	1.7	30.0

Organics - Volatiles, Prep Batch ID: VF200604W3

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

Blank (BLK)

Lab Sample ID: 200604B7.BLKW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 23:29, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200604W3 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200604B7.BLKW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 23:29, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:12, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		106.2	67.4	121.2
Acetone		108.8	29.9	161.5
Methyl iodide		106.1	68.8	116.4
Carbon disulfide		107.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		100.1	73.2	122.4
Acrylonitrile		104.1	69.9	128.9
2-Butanone (MEK)		102.7	44.0	134.4
Dichlorodifluoromethane		120.6	10.0	222.8
Chloromethane		114.1	23.8	166.5
Vinyl chloride		113.5	43.5	149.1
Bromomethane		101.6	56.8	151.3
Chloroethane		108.6	53.4	149.4
Trichlorofluoromethane		105.6	59.7	151.8
1,1-Dichloroethene		112.3	69.6	139.4
Methylene chloride		100.4	73.3	121.1
trans-1,2-Dichloroethene		109.8	73.6	129.3
1,1-Dichloroethane		110.1	71.5	126.2
cis-1,2-Dichloroethene		103.5	76.6	122.1
Tetrahydrofuran		102.1	59.0	117.9
Chloroform		107.0	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200604W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:12, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		103.1	78.2	120.8
1,1,1-Trichloroethane		106.8	79.4	130.9
4-Methyl-2-pentanone (MIBK)		100.3	71.6	125.2
2-Hexanone		100.1	55.4	136.9
Carbon tetrachloride		105.2	72.6	133.0
Benzene		105.9	79.9	124.9
1,2-Dichloroethane		102.7	76.0	126.3
Trichloroethene		106.7	79.7	124.2
1,2-Dichloropropane		106.6	78.6	126.4
Bromodichloromethane		104.9	80.4	128.2
Dibromomethane		98.9	76.9	122.1
cis-1,3-Dichloropropene		99.1	79.8	129.9
Toluene		102.7	79.8	124.5
trans-1,3-Dichloropropene		99.0	74.0	131.3
1,1,2-Trichloroethane		101.4	78.7	123.1
Tetrachloroethene	*	143.0	74.5	124.5
trans-1,4-Dichloro-2-butene		93.5	68.6	135.4
Dibromochloromethane		99.0	74.6	127.2
1,2-Dibromoethane		98.7	70.3	133.7
Chlorobenzene		99.4	79.2	122.7
1,1,1,2-Tetrachloroethane		100.6	80.3	128.2
Ethylbenzene		103.4	79.5	129.1
p,m-Xylene		100.5	79.4	132.2
o-Xylene		103.1	80.2	131.0
Styrene		100.4	69.5	126.7
Isopropylbenzene		104.4	74.4	121.5
Bromoform		96.7	69.4	128.0
1,1,2,2-Tetrachloroethane		97.8	79.8	126.3
1,2,3-Trichloropropane		99.8	78.3	138.8
n-Propylbenzene		105.8	82.0	130.7
Bromobenzene		97.3	78.7	124.6
1,3,5-Trimethylbenzene		101.9	81.3	128.9
tert-Butylbenzene		105.1	80.7	128.9
1,2,4-Trimethylbenzene		100.7	81.4	130.8
sec-Butylbenzene		108.7	77.4	129.8
p-Isopropyltoluene		107.3	79.8	137.5
1,3-Dichlorobenzene		101.7	77.0	131.3
1,4-Dichlorobenzene		99.6	20.7	137.7
1,2-Dichlorobenzene		102.0	10.0	166.2
1,2,3-Trimethylbenzene		101.4	76.3	124.2
n-Butylbenzene		107.0	80.0	133.3
Hexachloroethane		98.2	23.8	138.1
1,2-Dibromo-3-chloropropane		97.9	21.2	189.4
1,2,4-Trichlorobenzene		98.6	27.4	143.4
1,2,3-Trichlorobenzene		99.2	75.4	131.4
Naphthalene		100.6	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200604W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:12, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		97.6	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200604B7.LCSDW04C, Parent Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		102.9	67.4	121.2	3.2	30.0
Acetone		109.0	29.9	161.5	0.2	30.0
Methyl iodide		101.4	68.8	116.4	4.5	30.0
Carbon disulfide		104.5	63.8	137.4	3.0	30.0
tert-Methyl butyl ether (MTBE)		97.9	73.2	122.4	2.2	30.0
Acrylonitrile		101.8	69.9	128.9	2.3	30.0
2-Butanone (MEK)		104.4	44.0	134.4	1.6	30.0
Dichlorodifluoromethane		116.6	10.0	222.8	3.4	30.0
Chloromethane		111.7	23.8	166.5	2.1	30.0
Vinyl chloride		110.7	43.5	149.1	2.6	30.0
Bromomethane		106.5	56.8	151.3	4.7	30.0
Chloroethane		109.6	53.4	149.4	1.0	30.0
Trichlorofluoromethane		102.6	59.7	151.8	2.9	30.0
1,1-Dichloroethene		108.0	69.6	139.4	3.9	30.0
Methylene chloride		96.6	73.3	121.1	3.9	30.0
trans-1,2-Dichloroethene		105.0	73.6	129.3	4.5	30.0
1,1-Dichloroethane		105.1	71.5	126.2	4.7	30.0
cis-1,2-Dichloroethene		99.5	76.6	122.1	3.9	30.0
Tetrahydrofuran		103.0	59.0	117.9	0.9	30.0
Chloroform		102.4	78.4	124.0	4.4	30.0
Bromochloromethane		98.4	78.2	120.8	4.7	30.0
1,1,1-Trichloroethane		103.5	79.4	130.9	3.1	30.0
4-Methyl-2-pentanone (MIBK)		97.2	71.6	125.2	3.1	30.0
2-Hexanone		100.0	55.4	136.9	0.0	30.0
Carbon tetrachloride		99.0	72.6	133.0	6.1	30.0
Benzene		100.4	79.9	124.9	5.4	30.0
1,2-Dichloroethane		97.2	76.0	126.3	5.5	30.0
Trichloroethene		98.9	79.7	124.2	7.5	30.0
1,2-Dichloropropane		102.1	78.6	126.4	4.3	30.0
Bromodichloromethane		100.2	80.4	128.2	4.6	30.0
Dibromomethane		94.2	76.9	122.1	4.9	30.0
cis-1,3-Dichloropropene		97.9	79.8	129.9	1.2	30.0
Toluene		98.9	79.8	124.5	3.8	30.0
trans-1,3-Dichloropropene		96.9	74.0	131.3	2.1	30.0
1,1,2-Trichloroethane		99.5	78.7	123.1	2.0	30.0
Tetrachloroethene	*	93.5	74.5	124.5	41.8	30.0
trans-1,4-Dichloro-2-butene		90.7	68.6	135.4	3.0	30.0
Dibromochloromethane		95.5	74.6	127.2	3.6	30.0
1,2-Dibromoethane		95.8	70.3	133.7	2.9	30.0
Chlorobenzene		95.3	79.2	122.7	4.2	30.0

Organics - Volatiles, Prep Batch ID: VF200604W3 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200604B7.LCSDW04C, Parent Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		93.9	80.3	128.2	6.9	30.0
Ethylbenzene		98.5	79.5	129.1	4.8	30.0
p,m-Xylene		96.1	79.4	132.2	4.6	30.0
o-Xylene		98.0	80.2	131.0	5.1	30.0
Styrene		96.8	69.5	126.7	3.6	30.0
Isopropylbenzene		98.8	74.4	121.5	5.5	30.0
Bromoform		93.0	69.4	128.0	3.9	30.0
1,1,2,2-Tetrachloroethane		97.3	79.8	126.3	0.6	30.0
1,2,3-Trichloropropane		95.2	78.3	138.8	4.8	30.0
n-Propylbenzene		100.4	82.0	130.7	5.3	30.0
Bromobenzene		92.3	78.7	124.6	5.3	30.0
1,3,5-Trimethylbenzene		96.8	81.3	128.9	5.1	30.0
tert-Butylbenzene		99.1	80.7	128.9	5.9	30.0
1,2,4-Trimethylbenzene		95.4	81.4	130.8	5.4	30.0
sec-Butylbenzene		103.1	77.4	129.8	5.2	30.0
p-Isopropyltoluene		102.2	79.8	137.5	4.9	30.0
1,3-Dichlorobenzene		96.3	77.0	131.3	5.5	30.0
1,4-Dichlorobenzene		95.9	20.7	137.7	3.8	30.0
1,2-Dichlorobenzene		97.7	10.0	166.2	4.3	30.0
1,2,3-Trimethylbenzene		96.8	76.3	124.2	4.6	30.0
n-Butylbenzene		101.2	80.0	133.3	5.6	30.0
Hexachloroethane		94.5	23.8	138.1	3.8	30.0
1,2-Dibromo-3-chloropropane		94.9	21.2	189.4	3.1	30.0
1,2,4-Trichlorobenzene		94.8	27.4	143.4	3.9	30.0
1,2,3-Trichlorobenzene		95.7	75.4	131.4	3.6	30.0
Naphthalene		97.8	32.9	135.8	2.8	30.0
2-Methylnaphthalene		97.2	25.5	165.5	0.5	30.0

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		85.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.3	70.0	130.0	12.4	30.0

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.4	70.0	130.0	10.8	30.0

* Plant 6

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124705

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot dr
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 248 994 2240 | FAX NO. | P.O. NO
E-MAIL ADDRESS | QUOTE NO

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 30042872 / Racer Lansing - Plant 6
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz / Jessica F

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B SIMS	VOCs SM8260C/8260D	SVOCs SM8270D								
14507.01	6-3-20	1100	MW-04-D16R_060320	GW	3		3						X										
.02	6-3-20	1220	MW-04-04R_060320	GW	3		3						X										
.03	6-3-20	PM	Dup-11	GW	3		3						X										
.04	6-3-20	1530	MW-03-08_060320	GW	3		3						[illegible]	X									
.05	6-3-20	1230	MW-02-03(6)	GW	4	1	3						X	X	X								
.06	6-3-20	1225	MW-03-05	GW	3		3						X	X									
.07	6-3-2	AM	Trip Blank	L	1		1							X									
.08	6-3-20	PM	FB-04_060320	L	3		3							X									

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	☒ Sampler	6-3-20	
RECEIVED BY: SIGNATURE/ORGANIZATION		6/3/20	16:50
RELINQUISHED BY: SIGNATURE/ORGANIZATION		6/3/20	18:25
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	6/3/20	18:25

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE	TIME
		6/4/2020	0815
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		6/4/2020	0815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S14508-02
Generated on 07/07/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14508.01-S14508.07
Project: RACER Lansing
Submitted Date/Time: 06/04/2020 08:15
Sampled by: Daniel Stockard
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-8)
Prep Batch Summary (Page 9)
Surrogates per Lab Sample (Pages 10-16)
Surrogates per QC Sample (Pages 17-20)
Batch QC Results (Pages 21-32)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S14508.01

Sample Tag: PW-14-02_060320

Collected Date/Time: 06/03/2020 10:35

Matrix: Groundwater

COC Reference: 124709

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 16:29	200610A9	VS200610W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 06:16	200604B7	VF200604W3	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14508.02
Sample Tag: MW-19-115_060320
Collected Date/Time: 06/03/2020 12:30
Matrix: Groundwater
COC Reference: 124709

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 16:51	200610A9	VS200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14508.03

Sample Tag: DUP-04_060320

Collected Date/Time: 06/03/2020 00:01

Matrix: Groundwater

COC Reference: 124709

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 17:14	200610A9	VS200610W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 06:35	200604B7	VF200604W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14508.04

Sample Tag: MW-19-116_060320

Collected Date/Time: 06/03/2020 14:05

Matrix: Groundwater

COC Reference: 124709

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 17:36	200610A9	VS200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14508.05

Sample Tag: MW-19-117_060320

Collected Date/Time: 06/03/2020 15:40

Matrix: Groundwater

COC Reference: 124709

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 13:40	200611A9	VS200611W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14508.06

Sample Tag: MW-17-86_060320

Collected Date/Time: 06/03/2020 17:45

Matrix: Groundwater

COC Reference: 124709

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 18:20	200610A9	VS200610W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 06:55	200604B7	VF200604W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14508.07

Sample Tag: Trip Blank_060320

Collected Date/Time: 06/03/2020 00:01

Matrix: Water

COC Reference: 124709

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 23:05	200605B7	VF200605W2	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF200604W3

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14508.01	Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 06:16	200604B7
S14508.03	Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 06:35	200604B7
S14508.06	Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 06:55	200604B7

Organics - Volatiles, Prep Batch ID: VF200605W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14508.07	Volatile Organics - DEQ List	SW5030C/8260C	06/05/20 23:05	200605B7

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14508.01	1,4-Dioxane	SW8260B - SIM	06/10/20 16:29	200610A9
S14508.02	1,4-Dioxane	SW8260B - SIM	06/10/20 16:51	200610A9
S14508.03	1,4-Dioxane	SW8260B - SIM	06/10/20 17:14	200610A9
S14508.04	1,4-Dioxane	SW8260B - SIM	06/10/20 17:36	200610A9
S14508.06	1,4-Dioxane	SW8260B - SIM	06/10/20 18:20	200610A9

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14508.05	1,4-Dioxane	SW8260B - SIM	06/11/20 13:40	200611A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14508.01

Sample Tag: PW-14-02_060320

Collected Date/Time: 06/03/2020 10:35

Matrix: Groundwater

COC Reference: 124709

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 16:29, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604B7, Run Date: 06/05/2020 06:16, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.7**	80.0	124.0
1,2-Dichloroethane-D4		**102.6**	72.0	125.0
Toluene-D8		**100.5**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14508.02

Sample Tag: MW-19-115_060320

Collected Date/Time: 06/03/2020 12:30

Matrix: Groundwater

COC Reference: 124709

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 16:51, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14508.03

Sample Tag: DUP-04_060320

Collected Date/Time: 06/03/2020 00:01

Matrix: Groundwater

COC Reference: 124709

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 17:14, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604B7, Run Date: 06/05/2020 06:35, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.7**	80.0	124.0
1,2-Dichloroethane-D4		**104.5**	72.0	125.0
Toluene-D8		**101.2**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14508.04

Sample Tag: MW-19-116_060320

Collected Date/Time: 06/03/2020 14:05

Matrix: Groundwater

COC Reference: 124709

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 17:36, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14508.05

Sample Tag: MW-19-117_060320

Collected Date/Time: 06/03/2020 15:40

Matrix: Groundwater

COC Reference: 124709

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 13:40, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14508.06

Sample Tag: MW-17-86_060320

Collected Date/Time: 06/03/2020 17:45

Matrix: Groundwater

COC Reference: 124709

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 18:20, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200604B7, Run Date: 06/05/2020 06:55, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.9**	80.0	124.0
1,2-Dichloroethane-D4		**105.4**	72.0	125.0
Toluene-D8		**99.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14508.07

Sample Tag: Trip Blank_060320

Collected Date/Time: 06/03/2020 00:01

Matrix: Water

COC Reference: 124709

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200605B7, Run Date: 06/05/2020 23:05, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.6**	80.0	124.0
1,2-Dichloroethane-D4		**102.2**	72.0	125.0
Toluene-D8		**100.2**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200604W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200604B7.BLKW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 23:29, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**103.8**	72.0	125.0
Toluene-D8		**98.9**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:12, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**106.4**	72.0	125.0
Toluene-D8		**100.1**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200604B7.LCSDW04C, Parent Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.7**	80.0	124.0
1,2-Dichloroethane-D4		**107.1**	72.0	125.0
Toluene-D8		**101.2**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200605W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200605B7.BLKW05B

Run in Batch: 200605B7, Run Date: 06/05/2020 22:45, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**94.7**	80.0	124.0
1,2-Dichloroethane-D4		**101.2**	72.0	125.0
Toluene-D8		**100.9**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200605B7.LCSW05C

Run in Batch: 200605B7, Run Date: 06/05/2020 21:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.7**	80.0	124.0
1,2-Dichloroethane-D4		**106.7**	72.0	125.0
Toluene-D8		**99.8**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200605B7.LCSDW05C, Parent Sample ID: 200605B7.LCSW05C

Run in Batch: 200605B7, Run Date: 06/05/2020 21:47, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.3**	80.0	124.0
1,2-Dichloroethane-D4		**102.0**	72.0	125.0
Toluene-D8		**100.9**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200610W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200611W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VF200604W3

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

Blank (BLK)

Lab Sample ID: 200604B7.BLKW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 23:29, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200604W3 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200604B7.BLKW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 23:29, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:12, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		106.2	67.4	121.2
Acetone		108.8	29.9	161.5
Methyl iodide		106.1	68.8	116.4
Carbon disulfide		107.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		100.1	73.2	122.4
Acrylonitrile		104.1	69.9	128.9
2-Butanone (MEK)		102.7	44.0	134.4
Dichlorodifluoromethane		120.6	10.0	222.8
Chloromethane		114.1	23.8	166.5
Vinyl chloride		113.5	43.5	149.1
Bromomethane		101.6	56.8	151.3
Chloroethane		108.6	53.4	149.4
Trichlorofluoromethane		105.6	59.7	151.8
1,1-Dichloroethene		112.3	69.6	139.4
Methylene chloride		100.4	73.3	121.1
trans-1,2-Dichloroethene		109.8	73.6	129.3
1,1-Dichloroethane		110.1	71.5	126.2
cis-1,2-Dichloroethene		103.5	76.6	122.1
Tetrahydrofuran		102.1	59.0	117.9
Chloroform		107.0	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200604W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:12, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		103.1	78.2	120.8
1,1,1-Trichloroethane		106.8	79.4	130.9
4-Methyl-2-pentanone (MIBK)		100.3	71.6	125.2
2-Hexanone		100.1	55.4	136.9
Carbon tetrachloride		105.2	72.6	133.0
Benzene		105.9	79.9	124.9
1,2-Dichloroethane		102.7	76.0	126.3
Trichloroethene		106.7	79.7	124.2
1,2-Dichloropropane		106.6	78.6	126.4
Bromodichloromethane		104.9	80.4	128.2
Dibromomethane		98.9	76.9	122.1
cis-1,3-Dichloropropene		99.1	79.8	129.9
Toluene		102.7	79.8	124.5
trans-1,3-Dichloropropene		99.0	74.0	131.3
1,1,2-Trichloroethane		101.4	78.7	123.1
Tetrachloroethene	*	143.0	74.5	124.5
trans-1,4-Dichloro-2-butene		93.5	68.6	135.4
Dibromochloromethane		99.0	74.6	127.2
1,2-Dibromoethane		98.7	70.3	133.7
Chlorobenzene		99.4	79.2	122.7
1,1,1,2-Tetrachloroethane		100.6	80.3	128.2
Ethylbenzene		103.4	79.5	129.1
p,m-Xylene		100.5	79.4	132.2
o-Xylene		103.1	80.2	131.0
Styrene		100.4	69.5	126.7
Isopropylbenzene		104.4	74.4	121.5
Bromoform		96.7	69.4	128.0
1,1,2,2-Tetrachloroethane		97.8	79.8	126.3
1,2,3-Trichloropropane		99.8	78.3	138.8
n-Propylbenzene		105.8	82.0	130.7
Bromobenzene		97.3	78.7	124.6
1,3,5-Trimethylbenzene		101.9	81.3	128.9
tert-Butylbenzene		105.1	80.7	128.9
1,2,4-Trimethylbenzene		100.7	81.4	130.8
sec-Butylbenzene		108.7	77.4	129.8
p-Isopropyltoluene		107.3	79.8	137.5
1,3-Dichlorobenzene		101.7	77.0	131.3
1,4-Dichlorobenzene		99.6	20.7	137.7
1,2-Dichlorobenzene		102.0	10.0	166.2
1,2,3-Trimethylbenzene		101.4	76.3	124.2
n-Butylbenzene		107.0	80.0	133.3
Hexachloroethane		98.2	23.8	138.1
1,2-Dibromo-3-chloropropane		97.9	21.2	189.4
1,2,4-Trichlorobenzene		98.6	27.4	143.4
1,2,3-Trichlorobenzene		99.2	75.4	131.4
Naphthalene		100.6	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200604W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:12, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		97.6	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200604B7.LCSDW04C, Parent Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		102.9	67.4	121.2	3.2	30.0
Acetone		109.0	29.9	161.5	0.2	30.0
Methyl iodide		101.4	68.8	116.4	4.5	30.0
Carbon disulfide		104.5	63.8	137.4	3.0	30.0
tert-Methyl butyl ether (MTBE)		97.9	73.2	122.4	2.2	30.0
Acrylonitrile		101.8	69.9	128.9	2.3	30.0
2-Butanone (MEK)		104.4	44.0	134.4	1.6	30.0
Dichlorodifluoromethane		116.6	10.0	222.8	3.4	30.0
Chloromethane		111.7	23.8	166.5	2.1	30.0
Vinyl chloride		110.7	43.5	149.1	2.6	30.0
Bromomethane		106.5	56.8	151.3	4.7	30.0
Chloroethane		109.6	53.4	149.4	1.0	30.0
Trichlorofluoromethane		102.6	59.7	151.8	2.9	30.0
1,1-Dichloroethene		108.0	69.6	139.4	3.9	30.0
Methylene chloride		96.6	73.3	121.1	3.9	30.0
trans-1,2-Dichloroethene		105.0	73.6	129.3	4.5	30.0
1,1-Dichloroethane		105.1	71.5	126.2	4.7	30.0
cis-1,2-Dichloroethene		99.5	76.6	122.1	3.9	30.0
Tetrahydrofuran		103.0	59.0	117.9	0.9	30.0
Chloroform		102.4	78.4	124.0	4.4	30.0
Bromochloromethane		98.4	78.2	120.8	4.7	30.0
1,1,1-Trichloroethane		103.5	79.4	130.9	3.1	30.0
4-Methyl-2-pentanone (MIBK)		97.2	71.6	125.2	3.1	30.0
2-Hexanone		100.0	55.4	136.9	0.0	30.0
Carbon tetrachloride		99.0	72.6	133.0	6.1	30.0
Benzene		100.4	79.9	124.9	5.4	30.0
1,2-Dichloroethane		97.2	76.0	126.3	5.5	30.0
Trichloroethene		98.9	79.7	124.2	7.5	30.0
1,2-Dichloropropane		102.1	78.6	126.4	4.3	30.0
Bromodichloromethane		100.2	80.4	128.2	4.6	30.0
Dibromomethane		94.2	76.9	122.1	4.9	30.0
cis-1,3-Dichloropropene		97.9	79.8	129.9	1.2	30.0
Toluene		98.9	79.8	124.5	3.8	30.0
trans-1,3-Dichloropropene		96.9	74.0	131.3	2.1	30.0
1,1,2-Trichloroethane		99.5	78.7	123.1	2.0	30.0
Tetrachloroethene	*	93.5	74.5	124.5	41.8	30.0
trans-1,4-Dichloro-2-butene		90.7	68.6	135.4	3.0	30.0
Dibromochloromethane		95.5	74.6	127.2	3.6	30.0
1,2-Dibromoethane		95.8	70.3	133.7	2.9	30.0
Chlorobenzene		95.3	79.2	122.7	4.2	30.0

Organics - Volatiles, Prep Batch ID: VF200604W3 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200604B7.LCSDW04C, Parent Sample ID: 200604B7.LCSW04C

Run in Batch: 200604B7, Run Date: 06/04/2020 22:31, Prep Date: 06/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		93.9	80.3	128.2	6.9	30.0
Ethylbenzene		98.5	79.5	129.1	4.8	30.0
p,m-Xylene		96.1	79.4	132.2	4.6	30.0
o-Xylene		98.0	80.2	131.0	5.1	30.0
Styrene		96.8	69.5	126.7	3.6	30.0
Isopropylbenzene		98.8	74.4	121.5	5.5	30.0
Bromoform		93.0	69.4	128.0	3.9	30.0
1,1,2,2-Tetrachloroethane		97.3	79.8	126.3	0.6	30.0
1,2,3-Trichloropropane		95.2	78.3	138.8	4.8	30.0
n-Propylbenzene		100.4	82.0	130.7	5.3	30.0
Bromobenzene		92.3	78.7	124.6	5.3	30.0
1,3,5-Trimethylbenzene		96.8	81.3	128.9	5.1	30.0
tert-Butylbenzene		99.1	80.7	128.9	5.9	30.0
1,2,4-Trimethylbenzene		95.4	81.4	130.8	5.4	30.0
sec-Butylbenzene		103.1	77.4	129.8	5.2	30.0
p-Isopropyltoluene		102.2	79.8	137.5	4.9	30.0
1,3-Dichlorobenzene		96.3	77.0	131.3	5.5	30.0
1,4-Dichlorobenzene		95.9	20.7	137.7	3.8	30.0
1,2-Dichlorobenzene		97.7	10.0	166.2	4.3	30.0
1,2,3-Trimethylbenzene		96.8	76.3	124.2	4.6	30.0
n-Butylbenzene		101.2	80.0	133.3	5.6	30.0
Hexachloroethane		94.5	23.8	138.1	3.8	30.0
1,2-Dibromo-3-chloropropane		94.9	21.2	189.4	3.1	30.0
1,2,4-Trichlorobenzene		94.8	27.4	143.4	3.9	30.0
1,2,3-Trichlorobenzene		95.7	75.4	131.4	3.6	30.0
Naphthalene		97.8	32.9	135.8	2.8	30.0
2-Methylnaphthalene		97.2	25.5	165.5	0.5	30.0

Organics - Volatiles, Prep Batch ID: VF200605W2

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

Blank (BLK)

Lab Sample ID: 200605B7.BLKW05B

Run in Batch: 200605B7, Run Date: 06/05/2020 22:45, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200605W2 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200605B7.BLKW05B

Run in Batch: 200605B7, Run Date: 06/05/2020 22:45, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200605B7.LCSW05C

Run in Batch: 200605B7, Run Date: 06/05/2020 21:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		105.8	67.4	121.2
Acetone		106.3	29.9	161.5
Methyl iodide		104.2	68.8	116.4
Carbon disulfide		106.6	63.8	137.4
tert-Methyl butyl ether (MTBE)		104.0	73.2	122.4
Acrylonitrile		103.2	69.9	128.9
2-Butanone (MEK)		103.8	44.0	134.4
Dichlorodifluoromethane		119.8	10.0	222.8
Chloromethane		113.4	23.8	166.5
Vinyl chloride		111.5	43.5	149.1
Bromomethane		100.5	56.8	151.3
Chloroethane		106.6	53.4	149.4
Trichlorofluoromethane		103.1	59.7	151.8
1,1-Dichloroethene		109.4	69.6	139.4
Methylene chloride		99.2	73.3	121.1
trans-1,2-Dichloroethene		108.3	73.6	129.3
1,1-Dichloroethane		108.7	71.5	126.2
cis-1,2-Dichloroethene		104.2	76.6	122.1
Tetrahydrofuran		98.2	59.0	117.9
Chloroform		106.3	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200605W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200605B7.LCSW05C

Run in Batch: 200605B7, Run Date: 06/05/2020 21:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		103.3	78.2	120.8
1,1,1-Trichloroethane		106.2	79.4	130.9
4-Methyl-2-pentanone (MIBK)		102.0	71.6	125.2
2-Hexanone		101.8	55.4	136.9
Carbon tetrachloride		104.0	72.6	133.0
Benzene		105.8	79.9	124.9
1,2-Dichloroethane		102.2	76.0	126.3
Trichloroethene		103.8	79.7	124.2
1,2-Dichloropropane		105.1	78.6	126.4
Bromodichloromethane		103.5	80.4	128.2
Dibromomethane		99.4	76.9	122.1
cis-1,3-Dichloropropene		99.1	79.8	129.9
Toluene		103.5	79.8	124.5
trans-1,3-Dichloropropene		98.0	74.0	131.3
1,1,2-Trichloroethane		101.8	78.7	123.1
Tetrachloroethene		118.5	74.5	124.5
trans-1,4-Dichloro-2-butene		93.0	68.6	135.4
Dibromochloromethane		97.0	74.6	127.2
1,2-Dibromoethane		99.0	70.3	133.7
Chlorobenzene		99.5	79.2	122.7
1,1,1,2-Tetrachloroethane		101.1	80.3	128.2
Ethylbenzene		103.8	79.5	129.1
p,m-Xylene		101.8	79.4	132.2
o-Xylene		104.7	80.2	131.0
Styrene		101.9	69.5	126.7
Isopropylbenzene		106.8	74.4	121.5
Bromoform		94.3	69.4	128.0
1,1,2,2-Tetrachloroethane		101.2	79.8	126.3
1,2,3-Trichloropropane		102.3	78.3	138.8
n-Propylbenzene		105.9	82.0	130.7
Bromobenzene		98.4	78.7	124.6
1,3,5-Trimethylbenzene		104.5	81.3	128.9
tert-Butylbenzene		104.6	80.7	128.9
1,2,4-Trimethylbenzene		102.6	81.4	130.8
sec-Butylbenzene		106.4	77.4	129.8
p-Isopropyltoluene		104.0	79.8	137.5
1,3-Dichlorobenzene		100.4	77.0	131.3
1,4-Dichlorobenzene		99.6	20.7	137.7
1,2-Dichlorobenzene		101.7	10.0	166.2
1,2,3-Trimethylbenzene		105.2	76.3	124.2
n-Butylbenzene		102.3	80.0	133.3
Hexachloroethane		97.9	23.8	138.1
1,2-Dibromo-3-chloropropane		97.3	21.2	189.4
1,2,4-Trichlorobenzene		97.2	27.4	143.4
1,2,3-Trichlorobenzene		97.5	75.4	131.4
Naphthalene		101.9	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200605W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200605B7.LCSW05C

Run in Batch: 200605B7, Run Date: 06/05/2020 21:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		99.9	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200605B7.LCSDW05C, Parent Sample ID: 200605B7.LCSW05C

Run in Batch: 200605B7, Run Date: 06/05/2020 21:47, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		104.5	67.4	121.2	1.2	30.0
Acetone		102.8	29.9	161.5	3.3	30.0
Methyl iodide		104.9	68.8	116.4	0.7	30.0
Carbon disulfide		107.7	63.8	137.4	1.1	30.0
tert-Methyl butyl ether (MTBE)		103.7	73.2	122.4	0.3	30.0
Acrylonitrile		101.8	69.9	128.9	1.4	30.0
2-Butanone (MEK)		93.7	44.0	134.4	10.2	30.0
Dichlorodifluoromethane		121.8	10.0	222.8	1.7	30.0
Chloromethane		114.4	23.8	166.5	0.9	30.0
Vinyl chloride		112.2	43.5	149.1	0.7	30.0
Bromomethane		104.8	56.8	151.3	4.2	30.0
Chloroethane		107.0	53.4	149.4	0.4	30.0
Trichlorofluoromethane		103.6	59.7	151.8	0.5	30.0
1,1-Dichloroethene		110.5	69.6	139.4	1.0	30.0
Methylene chloride		99.7	73.3	121.1	0.5	30.0
trans-1,2-Dichloroethene		108.2	73.6	129.3	0.1	30.0
1,1-Dichloroethane		108.0	71.5	126.2	0.6	30.0
cis-1,2-Dichloroethene		103.5	76.6	122.1	0.7	30.0
Tetrahydrofuran		100.4	59.0	117.9	2.2	30.0
Chloroform		106.3	78.4	124.0	0.0	30.0
Bromochloromethane		102.7	78.2	120.8	0.6	30.0
1,1,1-Trichloroethane		106.7	79.4	130.9	0.5	30.0
4-Methyl-2-pentanone (MIBK)		100.2	71.6	125.2	1.8	30.0
2-Hexanone		102.2	55.4	136.9	0.4	30.0
Carbon tetrachloride		103.1	72.6	133.0	0.9	30.0
Benzene		105.9	79.9	124.9	0.1	30.0
1,2-Dichloroethane		100.7	76.0	126.3	1.5	30.0
Trichloroethene		104.3	79.7	124.2	0.4	30.0
1,2-Dichloropropane		105.5	78.6	126.4	0.3	30.0
Bromodichloromethane		102.7	80.4	128.2	0.8	30.0
Dibromomethane		99.1	76.9	122.1	0.3	30.0
cis-1,3-Dichloropropene		100.1	79.8	129.9	0.9	30.0
Toluene		103.6	79.8	124.5	0.1	30.0
trans-1,3-Dichloropropene		101.1	74.0	131.3	3.1	30.0
1,1,2-Trichloroethane		103.2	78.7	123.1	1.4	30.0
Tetrachloroethene		102.0	74.5	124.5	15.0	30.0
trans-1,4-Dichloro-2-butene		91.4	68.6	135.4	1.7	30.0
Dibromochloromethane		96.8	74.6	127.2	0.2	30.0
1,2-Dibromoethane		98.6	70.3	133.7	0.4	30.0
Chlorobenzene		98.4	79.2	122.7	1.1	30.0

Organics - Volatiles, Prep Batch ID: VF200605W2 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200605B7.LCSDW05C, Parent Sample ID: 200605B7.LCSW05C

Run in Batch: 200605B7, Run Date: 06/05/2020 21:47, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		97.6	80.3	128.2	3.5	30.0
Ethylbenzene		102.5	79.5	129.1	1.2	30.0
p,m-Xylene		99.9	79.4	132.2	1.9	30.0
o-Xylene		102.2	80.2	131.0	2.4	30.0
Styrene		100.9	69.5	126.7	1.0	30.0
Isopropylbenzene		102.8	74.4	121.5	3.8	30.0
Bromoform		93.7	69.4	128.0	0.7	30.0
1,1,2,2-Tetrachloroethane		98.7	79.8	126.3	2.5	30.0
1,2,3-Trichloropropane		98.8	78.3	138.8	3.5	30.0
n-Propylbenzene		104.2	82.0	130.7	1.7	30.0
Bromobenzene		96.2	78.7	124.6	2.2	30.0
1,3,5-Trimethylbenzene		100.9	81.3	128.9	3.5	30.0
tert-Butylbenzene		101.5	80.7	128.9	3.0	30.0
1,2,4-Trimethylbenzene		99.4	81.4	130.8	3.2	30.0
sec-Butylbenzene		104.6	77.4	129.8	1.7	30.0
p-Isopropyltoluene		103.2	79.8	137.5	0.7	30.0
1,3-Dichlorobenzene		99.2	77.0	131.3	1.2	30.0
1,4-Dichlorobenzene		98.8	20.7	137.7	0.8	30.0
1,2-Dichlorobenzene		101.2	10.0	166.2	0.5	30.0
1,2,3-Trimethylbenzene		101.8	76.3	124.2	3.3	30.0
n-Butylbenzene		101.8	80.0	133.3	0.5	30.0
Hexachloroethane		96.9	23.8	138.1	1.1	30.0
1,2-Dibromo-3-chloropropane		95.7	21.2	189.4	1.6	30.0
1,2,4-Trichlorobenzene		96.6	27.4	143.4	0.6	30.0
1,2,3-Trichlorobenzene		96.6	75.4	131.4	0.9	30.0
Naphthalene		99.9	32.9	135.8	1.9	30.0
2-Methylnaphthalene		101.1	25.5	165.5	1.1	30.0

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		85.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.3	70.0	130.0	12.4	30.0

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.4	70.0	130.0	10.8	30.0

Merit Laboratories, Inc.

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Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124709

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil Daniel Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: FAX NO.: P.O. NO:
E-MAIL ADDRESS: mike.spacil@arcadis.com daniel.stockard@arcadis.com QUOTE NO:

PROJECT NO./NAME: RACER Lansing
SAMPLER(S) PLEASE PRINT/SIGN NAME: Daniel Stockard

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO3	H2SO4	NaOH	MeOH	OTHER	VOCs SM5030C 8260C	1,4-Dioxane 8260B SIM
14508 .01	6/3/20	10:35	PW-14-02-060320	GW	3		3						X	X
.02	6/3/20	12:30	MW-19-115-060320	GW	3		3							X
.03	6/3/20		DUP-04	GW	3		3						X	X
.04	6/3/20	14:05	MW-19-116-060320	GW	3		3							X
.05	6/3/20	15:40	MW-19-117-060320	GW	3									X
.06	6/3/20	17:45	MW-17-86-060320	GW	3								X	X
.07	6/3/20		Trip Blank		1								X	

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Daniel Stockard ☒ Sampler	DATE: 6/3/20	TIME: 18:25	
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Dropbox	DATE: 6/3/20	TIME: 18:25	
RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 6/4/2020	TIME: 0815	
RECEIVED BY: SIGNATURE/ORGANIZATION: M Chilcott	DATE: 6/4/2020	TIME: 0815	
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL: 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Quality Control Report

Report ID: QC-S14576-01
Generated on 06/15/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14576.01-S14576.10
Project: 30042872 / RACER - Lansing Plant 6
Submitted Date/Time: 06/05/2020 08:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-11)
Prep Batch Summary (Pages 12-13)
Surrogates per Lab Sample (Pages 14-19)
Surrogates per QC Sample (Pages 20-23)
Batch QC Results (Pages 24-36)

Report Flag Descriptions

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

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

Barbara Ball

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S14576.01

Sample Tag: Trip Blank

Collected Date/Time: 06/04/2020 00:01

Matrix: Water

COC Reference: 124706

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 12:26	200610A9	VS200610W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 09:43	200606A7	VF200605W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14576.02

Sample Tag: MW-12-13_060420

Collected Date/Time: 06/04/2020 09:25

Matrix: Groundwater

COC Reference: 124706

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Metals						
Arsenic	E200.8	06/08/20 13:10	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/08/20 13:10	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Copper	E200.8	06/08/20 13:10	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Lead	E200.8	06/08/20 13:10	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/08/20 13:10	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/08/20 13:10	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD

Lab Sample ID: S14576.03

Sample Tag: Dup-10

Collected Date/Time: 06/04/2020 00:01

Matrix: Groundwater

COC Reference: 124706

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Metals						
Arsenic	E200.8	06/08/20 13:12	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/08/20 13:12	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Copper	E200.8	06/08/20 13:12	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Lead	E200.8	06/08/20 13:12	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/08/20 13:12	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/08/20 13:12	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD

Lab Sample ID: S14576.04

Sample Tag: MW-14-67_060420

Collected Date/Time: 06/04/2020 10:35

Matrix: Groundwater

COC Reference: 124706

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Metals						
Arsenic	E200.8	06/08/20 13:13	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/08/20 13:13	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Copper	E200.8	06/08/20 13:13	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Lead	E200.8	06/08/20 13:13	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/08/20 13:13	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/08/20 13:13	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD

Lab Sample ID: S14576.05

Sample Tag: MW-13-36R_060420

Collected Date/Time: 06/04/2020 11:30

Matrix: Groundwater

COC Reference: 124706

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Metals						
Arsenic	E200.8	06/08/20 13:15	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/08/20 13:15	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Copper	E200.8	06/08/20 13:15	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Lead	E200.8	06/08/20 13:15	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/08/20 13:15	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/08/20 13:15	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD

Lab Sample ID: S14576.06

Sample Tag: P6-SB-07_060420

Collected Date/Time: 06/04/2020 14:30

Matrix: Groundwater

COC Reference: 124706

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/10/20 20:59	P200610	SF200608W01	Yes	BLK/LCS/LCSD

Lab Sample ID: S14576.07

Sample Tag: MW-13-52_060420

Collected Date/Time: 06/04/2020 11:05

Matrix: Groundwater

COC Reference: 124706

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 14:03	200611A9	VS200611W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14576.08

Sample Tag: MW-13-50_060420

Collected Date/Time: 06/04/2020 13:35

Matrix: Groundwater

COC Reference: 124706

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 19:05	200610A9	VS200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14576.09

Sample Tag: MW-13-53_060420

Collected Date/Time: 06/04/2020 15:05

Matrix: Groundwater

COC Reference: 124706

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 19:26	200610A9	VS200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14576.10

Sample Tag: MWBP-10-UST5-6_060420

Collected Date/Time: 06/04/2020 16:00

Matrix: Groundwater

COC Reference: 124706

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Metals						
Arsenic	E200.8	06/08/20 13:17	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/08/20 13:17	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Copper	E200.8	06/08/20 13:17	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Lead	E200.8	06/08/20 13:17	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/08/20 13:17	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/08/20 13:17	MT4-20-0608B	MTD-060820-2	No	BLK/LCS/MS/MSD
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 10:03	200606A7	VF200605W3	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Metals, Prep Batch ID: MTD-060820-2

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14576.02	Arsenic	E200.8	06/08/20 13:10	MT4-20-0608B
S14576.02	Chromium	E200.8	06/08/20 13:10	MT4-20-0608B
S14576.02	Copper	E200.8	06/08/20 13:10	MT4-20-0608B
S14576.02	Lead	E200.8	06/08/20 13:10	MT4-20-0608B
S14576.02	Nickel	E200.8	06/08/20 13:10	MT4-20-0608B
S14576.02	Vanadium	E200.8	06/08/20 13:10	MT4-20-0608B
S14576.03	Arsenic	E200.8	06/08/20 13:12	MT4-20-0608B
S14576.03	Chromium	E200.8	06/08/20 13:12	MT4-20-0608B
S14576.03	Copper	E200.8	06/08/20 13:12	MT4-20-0608B
S14576.03	Lead	E200.8	06/08/20 13:12	MT4-20-0608B
S14576.03	Nickel	E200.8	06/08/20 13:12	MT4-20-0608B
S14576.03	Vanadium	E200.8	06/08/20 13:12	MT4-20-0608B
S14576.04	Arsenic	E200.8	06/08/20 13:13	MT4-20-0608B
S14576.04	Chromium	E200.8	06/08/20 13:13	MT4-20-0608B
S14576.04	Copper	E200.8	06/08/20 13:13	MT4-20-0608B
S14576.04	Lead	E200.8	06/08/20 13:13	MT4-20-0608B
S14576.04	Nickel	E200.8	06/08/20 13:13	MT4-20-0608B
S14576.04	Vanadium	E200.8	06/08/20 13:13	MT4-20-0608B
S14576.05	Arsenic	E200.8	06/08/20 13:15	MT4-20-0608B
S14576.05	Chromium	E200.8	06/08/20 13:15	MT4-20-0608B
S14576.05	Copper	E200.8	06/08/20 13:15	MT4-20-0608B
S14576.05	Lead	E200.8	06/08/20 13:15	MT4-20-0608B
S14576.05	Nickel	E200.8	06/08/20 13:15	MT4-20-0608B
S14576.05	Vanadium	E200.8	06/08/20 13:15	MT4-20-0608B
S14576.10	Arsenic	E200.8	06/08/20 13:17	MT4-20-0608B
S14576.10	Chromium	E200.8	06/08/20 13:17	MT4-20-0608B
S14576.10	Copper	E200.8	06/08/20 13:17	MT4-20-0608B
S14576.10	Lead	E200.8	06/08/20 13:17	MT4-20-0608B
S14576.10	Nickel	E200.8	06/08/20 13:17	MT4-20-0608B
S14576.10	Vanadium	E200.8	06/08/20 13:17	MT4-20-0608B

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14576.06	Semi-Volatile Organics - MDEQ	SW8270D	06/10/20 20:59	P200610

Organics - Volatiles, Prep Batch ID: VF200605W3

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14576.01	Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 09:43	200606A7
S14576.10	Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 10:03	200606A7

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14576.01	1,4-Dioxane	SW8260B - SIM	06/10/20 12:26	200610A9
S14576.08	1,4-Dioxane	SW8260B - SIM	06/10/20 19:05	200610A9
S14576.09	1,4-Dioxane	SW8260B - SIM	06/10/20 19:26	200610A9

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14576.07	1,4-Dioxane	SW8260B - SIM	06/11/20 14:03	200611A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14576.01

Sample Tag: Trip Blank

Collected Date/Time: 06/04/2020 00:01

Matrix: Water

COC Reference: 124706

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 12:26, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200606A7, Run Date: 06/06/2020 09:43, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.5**	80.0	124.0
1,2-Dichloroethane-D4		**102.8**	72.0	125.0
Toluene-D8		**99.3**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14576.06

Sample Tag: P6-SB-07_060420

Collected Date/Time: 06/04/2020 14:30

Matrix: Groundwater

COC Reference: 124706

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200610, Run Date: 06/10/2020 20:59, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**30.8**	10.0	110.0
Phenol-D5		**22.4**	10.0	110.0
Nitrobenzene-D5		**51.6**	10.0	114.0
2-Fluorobiphenyl		**55.0**	10.0	116.0
2,4,6-Tribromophenol		**54.5**	10.0	123.0
Terphenyl-D14		**57.5**	10.0	141.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14576.07

Sample Tag: MW-13-52_060420

Collected Date/Time: 06/04/2020 11:05

Matrix: Groundwater

COC Reference: 124706

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 14:03, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14576.08

Sample Tag: MW-13-50_060420

Collected Date/Time: 06/04/2020 13:35

Matrix: Groundwater

COC Reference: 124706

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 19:05, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14576.09

Sample Tag: MW-13-53_060420

Collected Date/Time: 06/04/2020 15:05

Matrix: Groundwater

COC Reference: 124706

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 19:26, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14576.10

Sample Tag: MWBP-10-UST5-6_060420

Collected Date/Time: 06/04/2020 16:00

Matrix: Groundwater

COC Reference: 124706

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200606A7, Run Date: 06/06/2020 10:03, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.3**	80.0	124.0
1,2-Dichloroethane-D4		**102.2**	72.0	125.0
Toluene-D8		**104.0**	89.0	112.0

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: P200610.BLKW08A

Run in Batch: P200610, Run Date: 06/10/2020 17:55, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**31.3**	10.0	110.0
Phenol-D5		**22.0**	10.0	110.0
Nitrobenzene-D5		**54.1**	10.0	114.0
2-Fluorobiphenyl		**55.0**	10.0	116.0
2,4,6-Tribromophenol		**56.1**	10.0	123.0
Terphenyl-D14		**56.1**	10.0	141.0

Laboratory Control Sample (LCS)

Lab Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 18:56, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**34.4**	10.0	110.0
Phenol-D5		**27.4**	10.0	110.0
Nitrobenzene-D5		**74.4**	10.0	114.0
2-Fluorobiphenyl		**75.7**	10.0	116.0
2,4,6-Tribromophenol		**67.1**	10.0	123.0
Terphenyl-D14		**79.9**	10.0	141.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200610.LCSDW08A, Parent Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 19:27, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**34.0**	10.0	110.0
Phenol-D5		**27.2**	10.0	110.0
Nitrobenzene-D5		**74.6**	10.0	114.0
2-Fluorobiphenyl		**76.1**	10.0	116.0
2,4,6-Tribromophenol		**63.5**	10.0	123.0
Terphenyl-D14		**76.8**	10.0	141.0

Organics - Volatiles, Prep Batch ID: VF200605W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200606A7.BLKW05C

Run in Batch: 200606A7, Run Date: 06/06/2020 08:45, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.4**	80.0	124.0
1,2-Dichloroethane-D4		**102.0**	72.0	125.0
Toluene-D8		**98.2**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.0**	80.0	124.0
1,2-Dichloroethane-D4		**106.6**	72.0	125.0
Toluene-D8		**100.8**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200606A7.LCSDW05D, Parent Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:47, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.5**	80.0	124.0
1,2-Dichloroethane-D4		**103.9**	72.0	125.0
Toluene-D8		**100.4**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200610W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200611W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Metals, Prep Batch ID: MTD-060820-2

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Blank (BLK)

Lab Sample ID: MT4-20-0608B.020.LRB

Run in Batch: MT4-20-0608B, Run Date: 06/08/2020 12:58, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Arsenic		ND	0.0004	mg/L
Chromium		ND	0.001	mg/L
Copper		ND	0.001	mg/L
Lead		ND	0.0006	mg/L
Nickel		ND	0.001	mg/L
Vanadium		ND	0.001	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: MT4-20-0608B.018.LCS

Run in Batch: MT4-20-0608B, Run Date: 06/08/2020 12:55, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Arsenic		103	85	115
Chromium		100	85	115
Copper		101	85	115
Lead		95	85	115
Nickel		99	85	115
Vanadium		101	85	115

Matrix Spike (MS)

Lab Sample ID: MT4-20-0608B.037.MS, Parent Sample ID: S14576.10

Run in Batch: MT4-20-0608B, Run Date: 06/08/2020 13:18, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Arsenic		102	75	125
Chromium		104	75	125
Copper		96	75	125
Lead		90	75	125
Nickel		98	75	125
Vanadium		110	75	125

Matrix Spike Duplicate (MSD)

Lab Sample ID: MT4-20-0608B.038.MSD, Parent Sample ID: MT4-20-0608B.037.MS

Run in Batch: MT4-20-0608B, Run Date: 06/08/2020 13:18, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Arsenic		106	75	125	3	20
Chromium		106	75	125	2	20
Copper		97	75	125	2	20
Lead		90	75	125	0	20
Nickel		98	75	125	0	20
Vanadium		110	75	125	0	20

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01

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

Blank (BLK)

Lab Sample ID: P200610.BLKW08A

Run in Batch: P200610, Run Date: 06/10/2020 17:55, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acenaphthene		ND	0.00050	mg/l
Acenaphthylene		ND	0.00050	mg/l
Anthracene		ND	0.00050	mg/l
Benzo(a)anthracene		ND	0.00050	mg/l
Benzo(b)fluoranthene		ND	0.00050	mg/l
Benzo(k)fluoranthene		ND	0.00050	mg/l
Benzo(ghi)perylene		ND	0.00050	mg/l
Benzo(a)pyrene		ND	0.00050	mg/l
bis(2-Chloroethoxy)methane		ND	0.00050	mg/l
bis(2-Chloroethyl)ether		ND	0.00050	mg/l
bis(2-Chloroisopropyl)ether		ND	0.00050	mg/l
bis(2-Ethylhexyl)phthalate		ND	0.00050	mg/l
4-Bromophenyl phenyl ether		ND	0.00050	mg/l
Butyl benzyl phthalate		ND	0.00050	mg/l
4-Chloroaniline		ND	0.00050	mg/l
2-Chloronaphthalene		ND	0.00050	mg/l
4-Chloro-3-methylphenol		ND	0.00050	mg/l
2-Chlorophenol		ND	0.00050	mg/l
4-Chlorophenyl phenyl ether		ND	0.00050	mg/l
Chrysene		ND	0.00050	mg/l
3-, 4-Methylphenol (p,m-Cresol)		ND	0.00100	mg/l
2-Methylphenol (o-Cresol)		ND	0.00050	mg/l
Dibenzo(ah)anthracene		ND	0.00050	mg/l
Dibenzofuran		ND	0.00050	mg/l
di-n-Butyl phthalate		ND	0.00050	mg/l
1,2-Dichlorobenzene		ND	0.00050	mg/l
1,3-Dichlorobenzene		ND	0.00050	mg/l
1,4-Dichlorobenzene		ND	0.00050	mg/l
3,3'-Dichlorobenzidine		ND	0.00050	mg/l
2,4-Dichlorophenol		ND	0.00050	mg/l
Diethyl phthalate		ND	0.00050	mg/l
2,4-Dimethylphenol		ND	0.00050	mg/l
Dimethyl phthalate		ND	0.00050	mg/l
4,6-Dinitro-2-methylphenol		ND	0.00050	mg/l
2,4-Dinitrophenol		ND	0.00050	mg/l
2,4-Dinitrotoluene		ND	0.00050	mg/l
2,6-Dinitrotoluene		ND	0.00050	mg/l
1,2-Diphenylhydrazine		ND	0.00050	mg/l
di-n-Octyl phthalate		ND	0.00050	mg/l
Fluoranthene		ND	0.00050	mg/l
Fluorene		ND	0.00050	mg/l
Hexachlorobenzene		ND	0.00050	mg/l
Hexachlorobutadiene		ND	0.00050	mg/l
Hexachlorocyclopentadiene		ND	0.00050	mg/l
Hexachloroethane		ND	0.00050	mg/l
Indeno(1,2,3-cd)pyrene		ND	0.00050	mg/l

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: P200610.BLKW08A

Run in Batch: P200610, Run Date: 06/10/2020 17:55, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Isophorone		ND	0.00050	mg/l
2-Methylnaphthalene		ND	0.00050	mg/l
Naphthalene		ND	0.00050	mg/l
2-Nitroaniline		ND	0.00050	mg/l
3-Nitroaniline		ND	0.00050	mg/l
4-Nitroaniline		ND	0.00050	mg/l
Nitrobenzene		ND	0.00050	mg/l
2-Nitrophenol		ND	0.00050	mg/l
4-Nitrophenol		ND	0.00050	mg/l
N-Nitrosodiphenylamine		ND	0.00050	mg/l
N-Nitrosodi-n-propylamine		ND	0.00050	mg/l
Pentachlorophenol		ND	0.00050	mg/l
Phenanthrene		ND	0.00050	mg/l
Phenol		ND	0.00050	mg/l
Pyrene		ND	0.00050	mg/l
1,2,4-Trichlorobenzene		ND	0.00050	mg/l
2,4,5-Trichlorophenol		ND	0.00050	mg/l
2,4,6-Trichlorophenol		ND	0.00050	mg/l

Laboratory Control Sample (LCS)

Lab Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 18:56, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		82.9	37.82	102.82
Acenaphthylene		88.3	34.75	114.76
Anthracene		87.4	38.29	107.17
Benzo(a)anthracene		90.0	39.45	103.23
Benzo(b)fluoranthene		94.3	39.3	105.62
Benzo(k)fluoranthene		80.3	37.32	99.27
Benzo(ghi)perylene		93.0	25.65	121.02
Benzo(a)pyrene		88.4	41	102.98
bis(2-Chloroethoxy)methane		83.5	38.96	94.94
bis(2-Chloroethyl)ether		72.0	32.79	92.32
bis(2-Chloroisopropyl)ether		62.4	28.96	95.55
bis(2-Ethylhexyl)phthalate		86.2	43.38	102.89
4-Bromophenyl phenyl ether		92.5	36.32	111.95
Butyl benzyl phthalate		84.5	41.29	98.17
4-Chloroaniline		69.7	11.53	72.6
2-Chloronaphthalene		81.2	36.7	102.59
4-Chloro-3-methylphenol		79.0	39.63	104.28
2-Chlorophenol		65.7	34.18	94.55
4-Chlorophenyl phenyl ether		85.7	38.63	115.88
Chrysene		92.2	42.42	104.5
3-, 4-Methylphenol (p,m-Cresol)		55.6	36.4	115.4
2-Methylphenol (o-Cresol)		67.1	37.3	120.0
Dibenzo(ah)anthracene		84.4	31.37	119.17

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 18:56, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Dibenzofuran		85.5	40.25	104.89
di-n-Butyl phthalate		90.1	42.66	109.16
1,2-Dichlorobenzene		61.4	35.29	149.51
1,3-Dichlorobenzene		58.6	32.15	155.22
1,4-Dichlorobenzene		58.5	33.22	151.25
3,3'-Dichlorobenzidine		79.8	26.1	103.71
2,4-Dichlorophenol		72.8	41.58	98.03
Diethyl phthalate		86.5	43.35	109.88
2,4-Dimethylphenol		82.2	39.69	104.6
Dimethyl phthalate		87.5	44.99	102.98
4,6-Dinitro-2-methylphenol		69.8	19.98	101.32
2,4-Dinitrophenol		60.5	10	109.59
2,4-Dinitrotoluene		86.6	37.33	115.88
2,6-Dinitrotoluene		89.0	41.24	106.63
1,2-Diphenylhydrazine		84.6	39.95	95.79
di-n-Octyl phthalate		87.6	38.19	107.3
Fluoranthene		90.7	39.79	106.64
Fluorene		87.3	36.94	108.4
Hexachlorobenzene		93.6	34.37	118.98
Hexachlorobutadiene		62.3	16.99	122.89
Hexachlorocyclopentadiene		66.1	21.56	132.1
Hexachloroethane		53.2	22.96	157.68
Indeno(1,2,3-cd)pyrene		89.2	29.55	116.59
Isophorone		85.6	33.67	101.86
2-Methylnaphthalene		74.5	29.6	140.3
Naphthalene		72.3	31.37	140.54
2-Nitroaniline		86.5	41.37	98.69
3-Nitroaniline		71.7	22.05	86.36
4-Nitroaniline		80.6	31.15	107.83
Nitrobenzene		74.8	38.21	124.16
2-Nitrophenol		69.1	38.56	92.8
4-Nitrophenol		34.3	13.39	116.72
N-Nitrosodiphenylamine		88.4	33.26	108.23
N-Nitrosodi-n-propylamine		75.7	32.25	95.51
Pentachlorophenol		59.6	17.09	112.61
Phenanthrene		84.8	37.67	105.05
Phenol		30.5	10	103.25
Pyrene		94.0	38.69	102.69
1,2,4-Trichlorobenzene		66.6	39.12	156.7
2,4,5-Trichlorophenol		75.6	38.05	112.24
2,4,6-Trichlorophenol		70.2	38.38	108.99

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200610.LCSDW08A, Parent Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 19:27, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		82.9	37.82	102.82	0.0	30.0
Acenaphthylene		89.0	34.75	114.76	0.8	30.0
Anthracene		86.0	38.29	107.17	1.6	30.0
Benzo(a)anthracene		89.8	39.45	103.23	0.1	30.0
Benzo(b)fluoranthene		92.9	39.3	105.62	1.4	30.0
Benzo(k)fluoranthene		82.4	37.32	99.27	2.5	30.0
Benzo(ghi)perylene		90.5	25.65	121.02	2.8	30.0
Benzo(a)pyrene		87.9	41	102.98	0.6	30.0
bis(2-Chloroethoxy)methane		84.9	38.96	94.94	1.7	30.0
bis(2-Chloroethyl)ether		72.5	32.79	92.32	0.7	30.0
bis(2-Chloroisopropyl)ether		62.3	28.96	95.55	0.2	30.0
bis(2-Ethylhexyl)phthalate		84.3	43.38	102.89	2.2	30.0
4-Bromophenyl phenyl ether		91.6	36.32	111.95	1.0	30.0
Butyl benzyl phthalate		83.0	41.29	98.17	1.8	30.0
4-Chloroaniline		71.4	11.53	72.6	2.4	30.0
2-Chloronaphthalene		79.7	36.7	102.59	1.9	30.0
4-Chloro-3-methylphenol		79.4	39.63	104.28	0.5	30.0
2-Chlorophenol		65.6	34.18	94.55	0.2	30.0
4-Chlorophenyl phenyl ether		84.6	38.63	115.88	1.2	30.0
Chrysene		88.5	42.42	104.5	4.1	30.0
3-, 4-Methylphenol (p,m-Cresol)		55.9	36.4	115.4	0.5	30.0
2-Methylphenol (o-Cresol)		67.3	37.3	120.0	0.4	30.0
Dibenzo(ah)anthracene		83.3	31.37	119.17	1.2	30.0
Dibenzofuran		86.1	40.25	104.89	0.7	30.0
di-n-Butyl phthalate		88.9	42.66	109.16	1.4	30.0
1,2-Dichlorobenzene		61.0	35.29	149.51	0.5	30.0
1,3-Dichlorobenzene		58.2	32.15	155.22	0.7	30.0
1,4-Dichlorobenzene		58.8	33.22	151.25	0.5	30.0
3,3'-Dichlorobenzidine		76.6	26.1	103.71	4.1	30.0
2,4-Dichlorophenol		72.5	41.58	98.03	0.4	30.0
Diethyl phthalate		86.6	43.35	109.88	0.0	30.0
2,4-Dimethylphenol		82.1	39.69	104.6	0.1	30.0
Dimethyl phthalate		86.0	44.99	102.98	1.8	30.0
4,6-Dinitro-2-methylphenol		67.9	19.98	101.32	2.7	30.0
2,4-Dinitrophenol		60.8	10	109.59	0.4	30.0
2,4-Dinitrotoluene		86.6	37.33	115.88	0.0	30.0
2,6-Dinitrotoluene		87.8	41.24	106.63	1.4	30.0
1,2-Diphenylhydrazine		86.6	39.95	95.79	2.4	30.0
di-n-Octyl phthalate		88.7	38.19	107.3	1.2	30.0
Fluoranthene		91.4	39.79	106.64	0.7	30.0
Fluorene		85.7	36.94	108.4	1.9	30.0
Hexachlorobenzene		89.0	34.37	118.98	5.0	30.0
Hexachlorobutadiene		63.5	16.99	122.89	1.8	30.0
Hexachlorocyclopentadiene		64.7	21.56	132.1	2.2	30.0
Hexachloroethane		53.6	22.96	157.68	0.9	30.0
Indeno(1,2,3-cd)pyrene	*	42.1	29.55	116.59	71.7	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF200608W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: P200610.LCSDW08A, Parent Sample ID: P200610.LCSW08A

Run in Batch: P200610, Run Date: 06/10/2020 19:27, Prep Date: 06/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isophorone		86.4	33.67	101.86	1.0	30.0
2-Methylnaphthalene		74.0	29.6	140.3	0.7	30.0
Naphthalene		72.2	31.37	140.54	0.1	30.0
2-Nitroaniline		88.9	41.37	98.69	2.6	30.0
3-Nitroaniline		71.8	22.05	86.36	0.1	30.0
4-Nitroaniline		81.2	31.15	107.83	0.8	30.0
Nitrobenzene		75.4	38.21	124.16	0.8	30.0
2-Nitrophenol		68.6	38.56	92.8	0.8	30.0
4-Nitrophenol		35.0	13.39	116.72	2.1	30.0
N-Nitrosodiphenylamine		89.3	33.26	108.23	1.0	30.0
N-Nitrosodi-n-propylamine		77.2	32.25	95.51	2.0	30.0
Pentachlorophenol		59.5	17.09	112.61	0.3	30.0
Phenanthrene		82.9	37.67	105.05	2.3	30.0
Phenol		30.1	10	103.25	1.5	30.0
Pyrene		90.5	38.69	102.69	3.8	30.0
1,2,4-Trichlorobenzene		69.4	39.12	156.7	4.1	30.0
2,4,5-Trichlorophenol		75.7	38.05	112.24	0.1	30.0
2,4,6-Trichlorophenol		69.0	38.38	108.99	1.7	30.0

Organics - Volatiles, Prep Batch ID: VF200605W3

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

Blank (BLK)

Lab Sample ID: 200606A7.BLKW05C

Run in Batch: 200606A7, Run Date: 06/06/2020 08:45, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200605W3 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200606A7.BLKW05C

Run in Batch: 200606A7, Run Date: 06/06/2020 08:45, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		103.7	67.4	121.2
Acetone		114.2	29.9	161.5
Methyl iodide		101.9	68.8	116.4
Carbon disulfide		103.4	63.8	137.4
tert-Methyl butyl ether (MTBE)		102.9	73.2	122.4
Acrylonitrile		104.0	69.9	128.9
2-Butanone (MEK)		104.4	44.0	134.4
Dichlorodifluoromethane		113.9	10.0	222.8
Chloromethane		107.8	23.8	166.5
Vinyl chloride		107.2	43.5	149.1
Bromomethane		97.3	56.8	151.3
Chloroethane		102.4	53.4	149.4
Trichlorofluoromethane		98.4	59.7	151.8
1,1-Dichloroethene		106.9	69.6	139.4
Methylene chloride		98.1	73.3	121.1
trans-1,2-Dichloroethene		105.8	73.6	129.3
1,1-Dichloroethane		107.0	71.5	126.2
cis-1,2-Dichloroethene		102.5	76.6	122.1
Tetrahydrofuran		100.7	59.0	117.9
Chloroform		104.7	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200605W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		102.0	78.2	120.8
1,1,1-Trichloroethane		102.6	79.4	130.9
4-Methyl-2-pentanone (MIBK)		101.2	71.6	125.2
2-Hexanone		103.5	55.4	136.9
Carbon tetrachloride		99.1	72.6	133.0
Benzene		104.0	79.9	124.9
1,2-Dichloroethane		100.7	76.0	126.3
Trichloroethene		103.4	79.7	124.2
1,2-Dichloropropane		105.0	78.6	126.4
Bromodichloromethane		101.4	80.4	128.2
Dibromomethane		98.6	76.9	122.1
cis-1,3-Dichloropropene		96.4	79.8	129.9
Toluene		102.8	79.8	124.5
trans-1,3-Dichloropropene		94.6	74.0	131.3
1,1,2-Trichloroethane		102.7	78.7	123.1
Tetrachloroethene	*	138.9	74.5	124.5
trans-1,4-Dichloro-2-butene		84.6	68.6	135.4
Dibromochloromethane		96.1	74.6	127.2
1,2-Dibromoethane		98.6	70.3	133.7
Chlorobenzene		98.5	79.2	122.7
1,1,1,2-Tetrachloroethane		97.2	80.3	128.2
Ethylbenzene		102.0	79.5	129.1
p,m-Xylene		99.2	79.4	132.2
o-Xylene		99.7	80.2	131.0
Styrene	*	3.3	69.5	126.7
Isopropylbenzene		102.2	74.4	121.5
Bromoform		91.2	69.4	128.0
1,1,2,2-Tetrachloroethane		97.6	79.8	126.3
1,2,3-Trichloropropane		99.3	78.3	138.8
n-Propylbenzene		102.5	82.0	130.7
Bromobenzene		96.1	78.7	124.6
1,3,5-Trimethylbenzene		100.0	81.3	128.9
tert-Butylbenzene		101.0	80.7	128.9
1,2,4-Trimethylbenzene		98.3	81.4	130.8
sec-Butylbenzene		103.9	77.4	129.8
p-Isopropyltoluene		101.5	79.8	137.5
1,3-Dichlorobenzene		98.1	77.0	131.3
1,4-Dichlorobenzene		97.9	20.7	137.7
1,2-Dichlorobenzene		100.4	10.0	166.2
1,2,3-Trimethylbenzene		102.8	76.3	124.2
n-Butylbenzene		99.9	80.0	133.3
Hexachloroethane		94.3	23.8	138.1
1,2-Dibromo-3-chloropropane		97.3	21.2	189.4
1,2,4-Trichlorobenzene		97.1	27.4	143.4
1,2,3-Trichlorobenzene		97.3	75.4	131.4
Naphthalene		102.2	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200605W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		102.4	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200606A7.LCSDW05D, Parent Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:47, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		107.2	67.4	121.2	3.4	30.0
Acetone		116.2	29.9	161.5	1.8	30.0
Methyl iodide		104.8	68.8	116.4	2.8	30.0
Carbon disulfide		105.0	63.8	137.4	1.5	30.0
tert-Methyl butyl ether (MTBE)		107.1	73.2	122.4	4.0	30.0
Acrylonitrile		103.7	69.9	128.9	0.3	30.0
2-Butanone (MEK)		105.3	44.0	134.4	0.8	30.0
Dichlorodifluoromethane		113.5	10.0	222.8	0.4	30.0
Chloromethane		111.1	23.8	166.5	3.1	30.0
Vinyl chloride		108.6	43.5	149.1	1.4	30.0
Bromomethane		99.2	56.8	151.3	1.9	30.0
Chloroethane		104.7	53.4	149.4	2.2	30.0
Trichlorofluoromethane		99.7	59.7	151.8	1.3	30.0
1,1-Dichloroethene		107.5	69.6	139.4	0.6	30.0
Methylene chloride		101.3	73.3	121.1	3.3	30.0
trans-1,2-Dichloroethene		107.7	73.6	129.3	1.8	30.0
1,1-Dichloroethane		109.4	71.5	126.2	2.2	30.0
cis-1,2-Dichloroethene		105.2	76.6	122.1	2.5	30.0
Tetrahydrofuran		103.1	59.0	117.9	2.4	30.0
Chloroform		108.0	78.4	124.0	3.0	30.0
Bromochloromethane		105.4	78.2	120.8	3.3	30.0
1,1,1-Trichloroethane		105.3	79.4	130.9	2.6	30.0
4-Methyl-2-pentanone (MIBK)		103.7	71.6	125.2	2.5	30.0
2-Hexanone		105.5	55.4	136.9	1.8	30.0
Carbon tetrachloride		100.0	72.6	133.0	0.9	30.0
Benzene		106.3	79.9	124.9	2.2	30.0
1,2-Dichloroethane		103.1	76.0	126.3	2.4	30.0
Trichloroethene		106.7	79.7	124.2	3.2	30.0
1,2-Dichloropropane		107.6	78.6	126.4	2.4	30.0
Bromodichloromethane		105.7	80.4	128.2	4.1	30.0
Dibromomethane		101.3	76.9	122.1	2.7	30.0
cis-1,3-Dichloropropene		98.7	79.8	129.9	2.4	30.0
Toluene		104.3	79.8	124.5	1.4	30.0
trans-1,3-Dichloropropene		97.6	74.0	131.3	3.1	30.0
1,1,2-Trichloroethane		105.1	78.7	123.1	2.3	30.0
Tetrachloroethene	*	158.1	74.5	124.5	12.9	30.0
trans-1,4-Dichloro-2-butene		85.9	68.6	135.4	1.5	30.0
Dibromochloromethane		99.5	74.6	127.2	3.5	30.0
1,2-Dibromoethane		101.2	70.3	133.7	2.6	30.0
Chlorobenzene		100.7	79.2	122.7	2.2	30.0

Organics - Volatiles, Prep Batch ID: VF200605W3 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200606A7.LCSDW05D, Parent Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:47, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		100.0	80.3	128.2	2.9	30.0
Ethylbenzene		104.3	79.5	129.1	2.2	30.0
p,m-Xylene		100.5	79.4	132.2	1.3	30.0
o-Xylene		102.1	80.2	131.0	2.4	30.0
Styrene	*	6.6	69.5	126.7	66.1	30.0
Isopropylbenzene		103.6	74.4	121.5	1.4	30.0
Bromoform		94.9	69.4	128.0	4.0	30.0
1,1,2,2-Tetrachloroethane		97.1	79.8	126.3	0.6	30.0
1,2,3-Trichloropropane		102.9	78.3	138.8	3.6	30.0
n-Propylbenzene		103.5	82.0	130.7	1.0	30.0
Bromobenzene		98.4	78.7	124.6	2.3	30.0
1,3,5-Trimethylbenzene		101.4	81.3	128.9	1.4	30.0
tert-Butylbenzene		102.7	80.7	128.9	1.7	30.0
1,2,4-Trimethylbenzene		100.5	81.4	130.8	2.3	30.0
sec-Butylbenzene		105.4	77.4	129.8	1.5	30.0
p-Isopropyltoluene		102.9	79.8	137.5	1.4	30.0
1,3-Dichlorobenzene		100.6	77.0	131.3	2.6	30.0
1,4-Dichlorobenzene		100.6	20.7	137.7	2.7	30.0
1,2-Dichlorobenzene		102.9	10.0	166.2	2.4	30.0
1,2,3-Trimethylbenzene		105.3	76.3	124.2	2.4	30.0
n-Butylbenzene		100.4	80.0	133.3	0.5	30.0
Hexachloroethane		96.8	23.8	138.1	2.6	30.0
1,2-Dibromo-3-chloropropane		96.9	21.2	189.4	0.4	30.0
1,2,4-Trichlorobenzene		98.0	27.4	143.4	0.9	30.0
1,2,3-Trichlorobenzene		99.5	75.4	131.4	2.3	30.0
Naphthalene		102.2	32.9	135.8	0.0	30.0
2-Methylnaphthalene		103.1	25.5	165.5	0.7	30.0

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		85.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.3	70.0	130.0	12.4	30.0

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.4	70.0	130.0	10.8	30.0

Plant 6

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124706

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 994 2240 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Michael.spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / Racer-Lansing Plant 6
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Metals # SM6020A/SM7471B	VOCs SM5030C/8260C	1,4-Dioxane 8260B SIM	SVOCs SM8270B	Special Instructions
14576 .01	6.4.20	AM	Trip Blank	L	1		1							X	X		* Select metals -
.02	6.4.20	0925	MW-12-13_060420	GW	1			1					X				As, Ni, Pb, V, Cr, Cu
.03	6.4.20	AM	Dup-10	GW	1			1					X				
.04	6.4.20	1035	MW-14-67_060420	GW	1			1					X				
.05	6.4.20	1130	MW-13-36R_060420	GW	1			1					X				
.06	6.4.20	1430	P6-SB-07_060420	GW	1	1										X	
.07	6.4.20	1105	MW-13-52_060420	GW	3		3								X		
.08	6.4.20	1335	MW-13-50_060420	GW	3		3								X		
.09	6.4.20	1505	MW-13-53_060420	GW	3										X		
.10	6.4.20	1600	MW-BP-10-45T5-6_060420	GW	3		3						X	X	X		

	SIGNATURE/ORGANIZATION	DATE	TIME
RELINQUISHED BY:	Sampler	6.4.20	
RECEIVED BY:		6/4/20	16:50
RELINQUISHED BY:		6/4/20	17:47
RECEIVED BY:	Merit Dropbox		

	SIGNATURE/ORGANIZATION	DATE	TIME
RELINQUISHED BY:	Merit Drop Box	6/5/2020	0815
RECEIVED BY:		6/5/2020	0815

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Quality Control Report

Report ID: QC-S14578-01
Generated on 06/15/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14578.01-S14578.09
Project: Monitoring
Submitted Date/Time: 06/05/2020 08:15
Sampled by: Unknown
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-10)
Prep Batch Summary (Page 11)
Surrogates per Lab Sample (Pages 12-20)
Surrogates per QC Sample (Pages 21-26)
Batch QC Results (Pages 27-43)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S14578.01

Sample Tag: MW-16-84_060420

Collected Date/Time: 06/04/2020 10:50

Matrix: Groundwater

COC Reference: 124712

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 19:49	200610A9	VS200610W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/09/20 13:03	200609A7	VF200609W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14578.02

Sample Tag: MW-19-120_060420

Collected Date/Time: 06/04/2020 12:40

Matrix: Groundwater

COC Reference: 124712

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 20:11	200610A9	VS200610W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 14:33	200606A7	VF200605W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14578.03

Sample Tag: DUP-03

Collected Date/Time: 06/04/2020 00:01

Matrix: Groundwater

COC Reference: 124712

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 14:31	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 14:53	200606A7	VF200605W3	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14578.04
Sample Tag: MW-19-121_060420
Collected Date/Time: 06/04/2020 14:05
Matrix: Groundwater
COC Reference: 124712

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	06/05/20 12:04	NTRA200605-W1-B	NTRA200605-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	06/08/20 20:26	TKN200608QC	TKN200608QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	06/10/20 14:37	PHS200610QC	PHS200610QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 23:47	200610B9	VS200610W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14578.05

Sample Tag: TW-14-02_060420

Collected Date/Time: 06/04/2020 15:30

Matrix: Groundwater

COC Reference: 124712

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 18:51	200611A9	VS200611W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 15:12	200606A7	VF200605W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14578.06

Sample Tag: MW-19-123_060420

Collected Date/Time: 06/04/2020 16:45

Matrix: Groundwater

COC Reference: 124712

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 14:53	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S14578.07

Sample Tag: FB-02_060420

Collected Date/Time: 06/04/2020 16:20

Matrix: Water

COC Reference: 124712

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 23:02	200610B9	VS200610W2	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 10:22	200606A7	VF200605W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14578.08

Sample Tag: EB-03_060420

Collected Date/Time: 06/04/2020 17:10

Matrix: Water

COC Reference: 124712

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/10/20 23:24	200610B9	VS200610W2	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 10:41	200606A7	VF200605W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14578.09

Sample Tag: Trip Blank

Collected Date/Time: 06/04/2020 00:01

Matrix: Water

COC Reference: 124712

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 11:01	200606A7	VF200605W3	Yes	BLK/LCS/LCSD

Inorganics, Prep Batch ID: NTRA200605-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14578.04	Nitrate-N	E300.0	06/05/20 12:04	NTRA200605-W1-B

Inorganics, Prep Batch ID: PHS200610QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14578.04	Total Phosphorus	SM4500-PE	06/10/20 14:37	PHS200610QC

Inorganics, Prep Batch ID: TKN200608QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14578.04	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	06/08/20 20:26	TKN200608QC

Organics - Volatiles, Prep Batch ID: VF200605W3

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14578.02	Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 14:33	200606A7
S14578.03	Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 14:53	200606A7
S14578.05	Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 15:12	200606A7
S14578.07	Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 10:22	200606A7
S14578.08	Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 10:41	200606A7
S14578.09	Volatile Organics - DEQ List	SW5030C/8260C	06/06/20 11:01	200606A7

Organics - Volatiles, Prep Batch ID: VF200609W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14578.01	Volatile Organics - DEQ List	SW5030C/8260C	06/09/20 13:03	200609A7

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14578.01	1,4-Dioxane	SW8260B - SIM	06/10/20 19:49	200610A9
S14578.02	1,4-Dioxane	SW8260B - SIM	06/10/20 20:11	200610A9

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14578.04	1,4-Dioxane	SW8260B - SIM	06/10/20 23:47	200610B9
S14578.07	1,4-Dioxane	SW8260B - SIM	06/10/20 23:02	200610B9
S14578.08	1,4-Dioxane	SW8260B - SIM	06/10/20 23:24	200610B9

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14578.05	1,4-Dioxane	SW8260B - SIM	06/11/20 18:51	200611A9

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14578.03	1,4-Dioxane	SW8260B - SIM	06/12/20 14:31	200612A9
S14578.06	1,4-Dioxane	SW8260B - SIM	06/12/20 14:53	200612A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14578.01

Sample Tag: MW-16-84_060420

Collected Date/Time: 06/04/2020 10:50

Matrix: Groundwater

COC Reference: 124712

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 19:49, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200609A7, Run Date: 06/09/2020 13:03, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.0**	80.0	124.0
1,2-Dichloroethane-D4		**101.5**	72.0	125.0
Toluene-D8		**104.1**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14578.02

Sample Tag: MW-19-120_060420

Collected Date/Time: 06/04/2020 12:40

Matrix: Groundwater

COC Reference: 124712

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610A9, Run Date: 06/10/2020 20:11, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200606A7, Run Date: 06/06/2020 14:33, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.6**	80.0	124.0
1,2-Dichloroethane-D4		**101.8**	72.0	125.0
Toluene-D8		**103.7**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14578.03

Sample Tag: DUP-03

Collected Date/Time: 06/04/2020 00:01

Matrix: Groundwater

COC Reference: 124712

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 14:31, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200606A7, Run Date: 06/06/2020 14:53, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.6**	80.0	124.0
1,2-Dichloroethane-D4		**102.1**	72.0	125.0
Toluene-D8		**103.7**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14578.04

Sample Tag: MW-19-121_060420

Collected Date/Time: 06/04/2020 14:05

Matrix: Groundwater

COC Reference: 124712

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/10/2020 23:47, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14578.05

Sample Tag: TW-14-02_060420

Collected Date/Time: 06/04/2020 15:30

Matrix: Groundwater

COC Reference: 124712

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 18:51, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200606A7, Run Date: 06/06/2020 15:12, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.5**	80.0	124.0
1,2-Dichloroethane-D4		**101.1**	72.0	125.0
Toluene-D8		**103.7**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14578.06

Sample Tag: MW-19-123_060420

Collected Date/Time: 06/04/2020 16:45

Matrix: Groundwater

COC Reference: 124712

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 14:53, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14578.07

Sample Tag: FB-02_060420

Collected Date/Time: 06/04/2020 16:20

Matrix: Water

COC Reference: 124712

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/10/2020 23:02, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200606A7, Run Date: 06/06/2020 10:22, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.5**	80.0	124.0
1,2-Dichloroethane-D4		**101.3**	72.0	125.0
Toluene-D8		**102.8**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14578.08

Sample Tag: EB-03_060420

Collected Date/Time: 06/04/2020 17:10

Matrix: Water

COC Reference: 124712

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/10/2020 23:24, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200606A7, Run Date: 06/06/2020 10:41, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.5**	80.0	124.0
1,2-Dichloroethane-D4		**100.6**	72.0	125.0
Toluene-D8		**103.2**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14578.09

Sample Tag: Trip Blank

Collected Date/Time: 06/04/2020 00:01

Matrix: Water

COC Reference: 124712

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200606A7, Run Date: 06/06/2020 11:01, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.0**	80.0	124.0
1,2-Dichloroethane-D4		**101.2**	72.0	125.0
Toluene-D8		**103.1**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF200605W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200606A7.BLKW05C

Run in Batch: 200606A7, Run Date: 06/06/2020 08:45, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.4**	80.0	124.0
1,2-Dichloroethane-D4		**102.0**	72.0	125.0
Toluene-D8		**98.2**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.0**	80.0	124.0
1,2-Dichloroethane-D4		**106.6**	72.0	125.0
Toluene-D8		**100.8**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200606A7.LCSDW05D, Parent Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:47, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.5**	80.0	124.0
1,2-Dichloroethane-D4		**103.9**	72.0	125.0
Toluene-D8		**100.4**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF200609W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200609A7.BLKW09A

Run in Batch: 200609A7, Run Date: 06/09/2020 11:07, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**104.8**	72.0	125.0
Toluene-D8		**103.5**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200609A7.LCSW09A

Run in Batch: 200609A7, Run Date: 06/09/2020 09:50, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.7**	80.0	124.0
1,2-Dichloroethane-D4		**101.6**	72.0	125.0
Toluene-D8		**104.6**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200609A7.LCSDW09A, Parent Sample ID: 200609A7.LCSW09A

Run in Batch: 200609A7, Run Date: 06/09/2020 10:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.2**	80.0	124.0
1,2-Dichloroethane-D4		**103.0**	72.0	125.0
Toluene-D8		**104.0**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200610W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**80.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200610W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200611W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200612W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)	*	**50.0**	60.0	140.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Inorganics, Prep Batch ID: NTRA200605-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA200605-W1-B.LRB1

Run in Batch: NTRA200605-W1-B, Run Date: 06/05/2020 07:48, Prep Date: 06/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA200605-W1-B.LCS1

Run in Batch: NTRA200605-W1-B, Run Date: 06/05/2020 08:13, Prep Date: 06/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		99	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA200605-W1-B.MS1, Parent Sample ID: S14524.01

Run in Batch: NTRA200605-W1-B, Run Date: 06/05/2020 10:47, Prep Date: 06/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		101	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA200605-W1-B.MSD1, Parent Sample ID: NTRA200605-W1-B.MS1

Run in Batch: NTRA200605-W1-B, Run Date: 06/05/2020 11:00, Prep Date: 06/05/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		101	80	120	0	15

Duplicate (DUP)

Lab Sample ID: NTRA200605-W1-B.DP1, Parent Sample ID: S14524.01

Run in Batch: NTRA200605-W1-B, Run Date: 06/05/2020 10:34, Prep Date: 06/05/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	RPD	RPD CL
Nitrate-N		<1	15

Inorganics, Prep Batch ID: PHS200610QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS200610QC.LRB1

Run in Batch: PHS200610QC, Run Date: 06/10/2020 13:20, Prep Date: 06/10/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS200610QC.LRB2

Run in Batch: PHS200610QC, Run Date: 06/10/2020 13:28, Prep Date: 06/10/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS200610QC.LCS1

Run in Batch: PHS200610QC, Run Date: 06/10/2020 13:37, Prep Date: 06/10/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		91	90	110

Matrix Spike (MS)

Lab Sample ID: PHS200610QC.MS1, Parent Sample ID: S14548.01

Run in Batch: PHS200610QC, Run Date: 06/10/2020 19:11, Prep Date: 06/10/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		91	80	120

Duplicate (DUP)

Lab Sample ID: PHS200610QC.DP1, Parent Sample ID: S14562.03

Run in Batch: PHS200610QC, Run Date: 06/10/2020 19:08, Prep Date: 06/10/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		2.6	20

Inorganics, Prep Batch ID: TKN200608QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN200608QC.LRB1

Run in Batch: TKN200608QC, Run Date: 06/08/2020 13:55, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.02	mg/L

Blank (BLK)

Lab Sample ID: TKN200608QC.LRB2

Run in Batch: TKN200608QC, Run Date: 06/08/2020 15:59, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN200608QC.LCS1

Run in Batch: TKN200608QC, Run Date: 06/08/2020 16:20, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		94	90	110

Matrix Spike (MS)

Lab Sample ID: TKN200608QC.MS1, Parent Sample ID: S14499.02

Run in Batch: TKN200608QC, Run Date: 06/08/2020 16:57, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		101	80	120

Duplicate (DUP)

Lab Sample ID: TKN200608QC.DP1, Parent Sample ID: S14499.01

Run in Batch: TKN200608QC, Run Date: 06/08/2020 16:39, Prep Date: 06/08/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		5.4	20

Organics - Volatiles, Prep Batch ID: VF200605W3

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

Blank (BLK)

Lab Sample ID: 200606A7.BLKW05C

Run in Batch: 200606A7, Run Date: 06/06/2020 08:45, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200605W3 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200606A7.BLKW05C

Run in Batch: 200606A7, Run Date: 06/06/2020 08:45, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		103.7	67.4	121.2
Acetone		114.2	29.9	161.5
Methyl iodide		101.9	68.8	116.4
Carbon disulfide		103.4	63.8	137.4
tert-Methyl butyl ether (MTBE)		102.9	73.2	122.4
Acrylonitrile		104.0	69.9	128.9
2-Butanone (MEK)		104.4	44.0	134.4
Dichlorodifluoromethane		113.9	10.0	222.8
Chloromethane		107.8	23.8	166.5
Vinyl chloride		107.2	43.5	149.1
Bromomethane		97.3	56.8	151.3
Chloroethane		102.4	53.4	149.4
Trichlorofluoromethane		98.4	59.7	151.8
1,1-Dichloroethene		106.9	69.6	139.4
Methylene chloride		98.1	73.3	121.1
trans-1,2-Dichloroethene		105.8	73.6	129.3
1,1-Dichloroethane		107.0	71.5	126.2
cis-1,2-Dichloroethene		102.5	76.6	122.1
Tetrahydrofuran		100.7	59.0	117.9
Chloroform		104.7	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200605W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		102.0	78.2	120.8
1,1,1-Trichloroethane		102.6	79.4	130.9
4-Methyl-2-pentanone (MIBK)		101.2	71.6	125.2
2-Hexanone		103.5	55.4	136.9
Carbon tetrachloride		99.1	72.6	133.0
Benzene		104.0	79.9	124.9
1,2-Dichloroethane		100.7	76.0	126.3
Trichloroethene		103.4	79.7	124.2
1,2-Dichloropropane		105.0	78.6	126.4
Bromodichloromethane		101.4	80.4	128.2
Dibromomethane		98.6	76.9	122.1
cis-1,3-Dichloropropene		96.4	79.8	129.9
Toluene		102.8	79.8	124.5
trans-1,3-Dichloropropene		94.6	74.0	131.3
1,1,2-Trichloroethane		102.7	78.7	123.1
Tetrachloroethene	*	138.9	74.5	124.5
trans-1,4-Dichloro-2-butene		84.6	68.6	135.4
Dibromochloromethane		96.1	74.6	127.2
1,2-Dibromoethane		98.6	70.3	133.7
Chlorobenzene		98.5	79.2	122.7
1,1,1,2-Tetrachloroethane		97.2	80.3	128.2
Ethylbenzene		102.0	79.5	129.1
p,m-Xylene		99.2	79.4	132.2
o-Xylene		99.7	80.2	131.0
Styrene	*	3.3	69.5	126.7
Isopropylbenzene		102.2	74.4	121.5
Bromoform		91.2	69.4	128.0
1,1,2,2-Tetrachloroethane		97.6	79.8	126.3
1,2,3-Trichloropropane		99.3	78.3	138.8
n-Propylbenzene		102.5	82.0	130.7
Bromobenzene		96.1	78.7	124.6
1,3,5-Trimethylbenzene		100.0	81.3	128.9
tert-Butylbenzene		101.0	80.7	128.9
1,2,4-Trimethylbenzene		98.3	81.4	130.8
sec-Butylbenzene		103.9	77.4	129.8
p-Isopropyltoluene		101.5	79.8	137.5
1,3-Dichlorobenzene		98.1	77.0	131.3
1,4-Dichlorobenzene		97.9	20.7	137.7
1,2-Dichlorobenzene		100.4	10.0	166.2
1,2,3-Trimethylbenzene		102.8	76.3	124.2
n-Butylbenzene		99.9	80.0	133.3
Hexachloroethane		94.3	23.8	138.1
1,2-Dibromo-3-chloropropane		97.3	21.2	189.4
1,2,4-Trichlorobenzene		97.1	27.4	143.4
1,2,3-Trichlorobenzene		97.3	75.4	131.4
Naphthalene		102.2	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200605W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:28, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		102.4	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200606A7.LCSDW05D, Parent Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:47, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		107.2	67.4	121.2	3.4	30.0
Acetone		116.2	29.9	161.5	1.8	30.0
Methyl iodide		104.8	68.8	116.4	2.8	30.0
Carbon disulfide		105.0	63.8	137.4	1.5	30.0
tert-Methyl butyl ether (MTBE)		107.1	73.2	122.4	4.0	30.0
Acrylonitrile		103.7	69.9	128.9	0.3	30.0
2-Butanone (MEK)		105.3	44.0	134.4	0.8	30.0
Dichlorodifluoromethane		113.5	10.0	222.8	0.4	30.0
Chloromethane		111.1	23.8	166.5	3.1	30.0
Vinyl chloride		108.6	43.5	149.1	1.4	30.0
Bromomethane		99.2	56.8	151.3	1.9	30.0
Chloroethane		104.7	53.4	149.4	2.2	30.0
Trichlorofluoromethane		99.7	59.7	151.8	1.3	30.0
1,1-Dichloroethene		107.5	69.6	139.4	0.6	30.0
Methylene chloride		101.3	73.3	121.1	3.3	30.0
trans-1,2-Dichloroethene		107.7	73.6	129.3	1.8	30.0
1,1-Dichloroethane		109.4	71.5	126.2	2.2	30.0
cis-1,2-Dichloroethene		105.2	76.6	122.1	2.5	30.0
Tetrahydrofuran		103.1	59.0	117.9	2.4	30.0
Chloroform		108.0	78.4	124.0	3.0	30.0
Bromochloromethane		105.4	78.2	120.8	3.3	30.0
1,1,1-Trichloroethane		105.3	79.4	130.9	2.6	30.0
4-Methyl-2-pentanone (MIBK)		103.7	71.6	125.2	2.5	30.0
2-Hexanone		105.5	55.4	136.9	1.8	30.0
Carbon tetrachloride		100.0	72.6	133.0	0.9	30.0
Benzene		106.3	79.9	124.9	2.2	30.0
1,2-Dichloroethane		103.1	76.0	126.3	2.4	30.0
Trichloroethene		106.7	79.7	124.2	3.2	30.0
1,2-Dichloropropane		107.6	78.6	126.4	2.4	30.0
Bromodichloromethane		105.7	80.4	128.2	4.1	30.0
Dibromomethane		101.3	76.9	122.1	2.7	30.0
cis-1,3-Dichloropropene		98.7	79.8	129.9	2.4	30.0
Toluene		104.3	79.8	124.5	1.4	30.0
trans-1,3-Dichloropropene		97.6	74.0	131.3	3.1	30.0
1,1,2-Trichloroethane		105.1	78.7	123.1	2.3	30.0
Tetrachloroethene	*	158.1	74.5	124.5	12.9	30.0
trans-1,4-Dichloro-2-butene		85.9	68.6	135.4	1.5	30.0
Dibromochloromethane		99.5	74.6	127.2	3.5	30.0
1,2-Dibromoethane		101.2	70.3	133.7	2.6	30.0
Chlorobenzene		100.7	79.2	122.7	2.2	30.0

Organics - Volatiles, Prep Batch ID: VF200605W3 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200606A7.LCSDW05D, Parent Sample ID: 200606A7.LCSW05D

Run in Batch: 200606A7, Run Date: 06/06/2020 07:47, Prep Date: 06/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		100.0	80.3	128.2	2.9	30.0
Ethylbenzene		104.3	79.5	129.1	2.2	30.0
p,m-Xylene		100.5	79.4	132.2	1.3	30.0
o-Xylene		102.1	80.2	131.0	2.4	30.0
Styrene	*	6.6	69.5	126.7	66.1	30.0
Isopropylbenzene		103.6	74.4	121.5	1.4	30.0
Bromoform		94.9	69.4	128.0	4.0	30.0
1,1,2,2-Tetrachloroethane		97.1	79.8	126.3	0.6	30.0
1,2,3-Trichloropropane		102.9	78.3	138.8	3.6	30.0
n-Propylbenzene		103.5	82.0	130.7	1.0	30.0
Bromobenzene		98.4	78.7	124.6	2.3	30.0
1,3,5-Trimethylbenzene		101.4	81.3	128.9	1.4	30.0
tert-Butylbenzene		102.7	80.7	128.9	1.7	30.0
1,2,4-Trimethylbenzene		100.5	81.4	130.8	2.3	30.0
sec-Butylbenzene		105.4	77.4	129.8	1.5	30.0
p-Isopropyltoluene		102.9	79.8	137.5	1.4	30.0
1,3-Dichlorobenzene		100.6	77.0	131.3	2.6	30.0
1,4-Dichlorobenzene		100.6	20.7	137.7	2.7	30.0
1,2-Dichlorobenzene		102.9	10.0	166.2	2.4	30.0
1,2,3-Trimethylbenzene		105.3	76.3	124.2	2.4	30.0
n-Butylbenzene		100.4	80.0	133.3	0.5	30.0
Hexachloroethane		96.8	23.8	138.1	2.6	30.0
1,2-Dibromo-3-chloropropane		96.9	21.2	189.4	0.4	30.0
1,2,4-Trichlorobenzene		98.0	27.4	143.4	0.9	30.0
1,2,3-Trichlorobenzene		99.5	75.4	131.4	2.3	30.0
Naphthalene		102.2	32.9	135.8	0.0	30.0
2-Methylnaphthalene		103.1	25.5	165.5	0.7	30.0

Organics - Volatiles, Prep Batch ID: VF200609W1

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

Blank (BLK)

Lab Sample ID: 200609A7.BLKW09A

Run in Batch: 200609A7, Run Date: 06/09/2020 11:07, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200609W1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200609A7.BLKW09A

Run in Batch: 200609A7, Run Date: 06/09/2020 11:07, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200609A7.LCSW09A

Run in Batch: 200609A7, Run Date: 06/09/2020 09:50, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		107.5	67.4	121.2
Acetone		109.8	29.9	161.5
Methyl iodide		106.8	68.8	116.4
Carbon disulfide		109.4	63.8	137.4
tert-Methyl butyl ether (MTBE)		106.1	73.2	122.4
Acrylonitrile		108.2	69.9	128.9
2-Butanone (MEK)		105.1	44.0	134.4
Dichlorodifluoromethane		109.1	10.0	222.8
Chloromethane		106.7	23.8	166.5
Vinyl chloride		107.1	43.5	149.1
Bromomethane		99.2	56.8	151.3
Chloroethane		103.5	53.4	149.4
Trichlorofluoromethane		100.5	59.7	151.8
1,1-Dichloroethene		111.6	69.6	139.4
Methylene chloride		101.9	73.3	121.1
trans-1,2-Dichloroethene		108.6	73.6	129.3
1,1-Dichloroethane		108.9	71.5	126.2
cis-1,2-Dichloroethene		104.7	76.6	122.1
Tetrahydrofuran		108.9	59.0	117.9
Chloroform		105.3	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200609W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200609A7.LCSW09A

Run in Batch: 200609A7, Run Date: 06/09/2020 09:50, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		103.6	78.2	120.8
1,1,1-Trichloroethane		106.6	79.4	130.9
4-Methyl-2-pentanone (MIBK)		106.3	71.6	125.2
2-Hexanone		113.7	55.4	136.9
Carbon tetrachloride		101.1	72.6	133.0
Benzene		104.1	79.9	124.9
1,2-Dichloroethane		98.3	76.0	126.3
Trichloroethene		101.7	79.7	124.2
1,2-Dichloropropane		106.2	78.6	126.4
Bromodichloromethane		102.7	80.4	128.2
Dibromomethane		98.9	76.9	122.1
cis-1,3-Dichloropropene		107.9	79.8	129.9
Toluene		105.6	79.8	124.5
trans-1,3-Dichloropropene		109.9	74.0	131.3
1,1,2-Trichloroethane		107.6	78.7	123.1
Tetrachloroethene		99.1	74.5	124.5
trans-1,4-Dichloro-2-butene		102.2	68.6	135.4
Dibromochloromethane		96.8	74.6	127.2
1,2-Dibromoethane		100.6	70.3	133.7
Chlorobenzene		98.7	79.2	122.7
1,1,1,2-Tetrachloroethane		93.5	80.3	128.2
Ethylbenzene		102.1	79.5	129.1
p,m-Xylene		100.0	79.4	132.2
o-Xylene		98.9	80.2	131.0
Styrene		100.8	69.5	126.7
Isopropylbenzene		99.7	74.4	121.5
Bromoform		95.5	69.4	128.0
1,1,2,2-Tetrachloroethane		101.3	79.8	126.3
1,2,3-Trichloropropane		100.4	78.3	138.8
n-Propylbenzene		102.5	82.0	130.7
Bromobenzene		97.1	78.7	124.6
1,3,5-Trimethylbenzene		98.0	81.3	128.9
tert-Butylbenzene		96.7	80.7	128.9
1,2,4-Trimethylbenzene		97.0	81.4	130.8
sec-Butylbenzene		100.4	77.4	129.8
p-Isopropyltoluene		99.7	79.8	137.5
1,3-Dichlorobenzene		97.5	77.0	131.3
1,4-Dichlorobenzene		97.3	20.7	137.7
1,2-Dichlorobenzene		97.1	10.0	166.2
1,2,3-Trimethylbenzene		96.8	76.3	124.2
n-Butylbenzene		100.9	80.0	133.3
Hexachloroethane		88.8	23.8	138.1
1,2-Dibromo-3-chloropropane		96.9	21.2	189.4
1,2,4-Trichlorobenzene		92.7	27.4	143.4
1,2,3-Trichlorobenzene		92.5	75.4	131.4
Naphthalene		96.1	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200609W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200609A7.LCSW09A

Run in Batch: 200609A7, Run Date: 06/09/2020 09:50, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		94.6	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200609A7.LCSDW09A, Parent Sample ID: 200609A7.LCSW09A

Run in Batch: 200609A7, Run Date: 06/09/2020 10:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		112.0	67.4	121.2	4.1	30.0
Acetone		107.8	29.9	161.5	1.8	30.0
Methyl iodide		111.7	68.8	116.4	4.5	30.0
Carbon disulfide		115.3	63.8	137.4	5.2	30.0
tert-Methyl butyl ether (MTBE)		109.6	73.2	122.4	3.3	30.0
Acrylonitrile		109.6	69.9	128.9	1.3	30.0
2-Butanone (MEK)		104.5	44.0	134.4	0.5	30.0
Dichlorodifluoromethane		117.0	10.0	222.8	7.0	30.0
Chloromethane		112.8	23.8	166.5	5.6	30.0
Vinyl chloride		112.9	43.5	149.1	5.3	30.0
Bromomethane		103.8	56.8	151.3	4.5	30.0
Chloroethane		108.5	53.4	149.4	4.7	30.0
Trichlorofluoromethane		104.9	59.7	151.8	4.3	30.0
1,1-Dichloroethene		117.1	69.6	139.4	4.7	30.0
Methylene chloride		106.0	73.3	121.1	3.9	30.0
trans-1,2-Dichloroethene		113.0	73.6	129.3	3.9	30.0
1,1-Dichloroethane		113.3	71.5	126.2	4.0	30.0
cis-1,2-Dichloroethene		109.8	76.6	122.1	4.8	30.0
Tetrahydrofuran		110.0	59.0	117.9	1.0	30.0
Chloroform		110.3	78.4	124.0	4.6	30.0
Bromochloromethane		108.0	78.2	120.8	4.1	30.0
1,1,1-Trichloroethane		110.4	79.4	130.9	3.5	30.0
4-Methyl-2-pentanone (MIBK)		106.6	71.6	125.2	0.3	30.0
2-Hexanone		111.3	55.4	136.9	2.1	30.0
Carbon tetrachloride		104.7	72.6	133.0	3.6	30.0
Benzene		107.0	79.9	124.9	2.8	30.0
1,2-Dichloroethane		100.3	76.0	126.3	2.0	30.0
Trichloroethene		104.4	79.7	124.2	2.7	30.0
1,2-Dichloropropane		108.3	78.6	126.4	2.0	30.0
Bromodichloromethane		104.2	80.4	128.2	1.4	30.0
Dibromomethane		101.2	76.9	122.1	2.3	30.0
cis-1,3-Dichloropropene		109.3	79.8	129.9	1.3	30.0
Toluene		108.1	79.8	124.5	2.3	30.0
trans-1,3-Dichloropropene		111.6	74.0	131.3	1.5	30.0
1,1,2-Trichloroethane		109.0	78.7	123.1	1.3	30.0
Tetrachloroethene		101.0	74.5	124.5	1.9	30.0
trans-1,4-Dichloro-2-butene		102.4	68.6	135.4	0.2	30.0
Dibromochloromethane		97.4	74.6	127.2	0.6	30.0
1,2-Dibromoethane		101.1	70.3	133.7	0.5	30.0
Chlorobenzene		100.4	79.2	122.7	1.7	30.0

Organics - Volatiles, Prep Batch ID: VF200609W1 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200609A7.LCSDW09A, Parent Sample ID: 200609A7.LCSW09A

Run in Batch: 200609A7, Run Date: 06/09/2020 10:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		95.1	80.3	128.2	1.7	30.0
Ethylbenzene		103.4	79.5	129.1	1.3	30.0
p,m-Xylene		101.5	79.4	132.2	1.4	30.0
o-Xylene		100.8	80.2	131.0	1.9	30.0
Styrene		102.2	69.5	126.7	1.4	30.0
Isopropylbenzene		103.1	74.4	121.5	3.3	30.0
Bromoform		95.8	69.4	128.0	0.4	30.0
1,1,2,2-Tetrachloroethane		100.9	79.8	126.3	0.4	30.0
1,2,3-Trichloropropane		100.4	78.3	138.8	0.1	30.0
n-Propylbenzene		105.3	82.0	130.7	2.8	30.0
Bromobenzene		97.3	78.7	124.6	0.2	30.0
1,3,5-Trimethylbenzene		100.7	81.3	128.9	2.8	30.0
tert-Butylbenzene		99.6	80.7	128.9	3.0	30.0
1,2,4-Trimethylbenzene		99.5	81.4	130.8	2.6	30.0
sec-Butylbenzene		104.9	77.4	129.8	4.4	30.0
p-Isopropyltoluene		103.4	79.8	137.5	3.6	30.0
1,3-Dichlorobenzene		99.7	77.0	131.3	2.2	30.0
1,4-Dichlorobenzene		99.8	20.7	137.7	2.6	30.0
1,2-Dichlorobenzene		99.2	10.0	166.2	2.2	30.0
1,2,3-Trimethylbenzene		99.9	76.3	124.2	3.1	30.0
n-Butylbenzene		104.2	80.0	133.3	3.2	30.0
Hexachloroethane		92.9	23.8	138.1	4.4	30.0
1,2-Dibromo-3-chloropropane		98.0	21.2	189.4	1.1	30.0
1,2,4-Trichlorobenzene		97.2	27.4	143.4	4.7	30.0
1,2,3-Trichlorobenzene		97.6	75.4	131.4	5.3	30.0
Naphthalene		99.0	32.9	135.8	3.0	30.0
2-Methylnaphthalene		101.2	25.5	165.5	6.7	30.0

Organics - Volatiles, Prep Batch ID: VS200610W1

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

Blank (BLK)

Lab Sample ID: 200610A9.BLKS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 11:38, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:35, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		85.1	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A9.LCSDS09A, Parent Sample ID: 200610A9.LCSS09A

Run in Batch: 200610A9, Run Date: 06/10/2020 10:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.3	70.0	130.0	12.4	30.0

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		96.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.8	70.0	130.0	16.2	30.0

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.4	70.0	130.0	10.8	30.0

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		94.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		105.0	70.0	130.0	10.7	30.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.4	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		111.3	70.0	130.0	7.2	30.0

Merit Laboratories, Inc.
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Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124712

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil Daniel Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO. FAX NO. P.O. NO.
E-MAIL ADDRESS: Mike.Spacil@arcadis.com daniel.stockard@arcadis.com QUOTE NO.

INVOICE TO

CONTACT NAME X SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME
SAMPLER(S) - PLEASE PRINT/SIGN NAME

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs 8260C	1,4-Dioxane 8260B SIM	Nitrate E300	TKN 351.2 Nitrog/NH_3	TP SM4500-PE	Special Instructions
14578.01	6/4/20	10:50	MW-16-84-060420	GW	3		3						X	X				
.02	6/4/20	12:40	MW-19-120-060420	GW	3		3						X	X				
.03	6/4/20		DUP-03	GW	3		3						X	X				
.04	6/4/20	14:05	MW-19-121-060420	GW	5	1	3		1				X	X	X	X	X	No VOCs
.05	6/4/20	15:30	TW-19-02-060420	GW	3		3						X	X				
.06	6/4/20	16:45	MW-19-123-060420	GW	3		3							X				
.07	6/4/20	16:20	FB-02-060420	GW	3		3						X	X				
.08	6/4/20	17:10	EB-03-060420	GW	3		3						X	X				
.09																		

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Daniel Stockard / Sampler	6/4/20	17:37	Merit Drop Box	6/5/2020 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	6/4/20	17:47	M Chilcoat	6/5/2020 0815
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME		
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME		

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Quality Control Report

Report ID: QC-S14611-02
Generated on 07/07/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14611.01-S14611.05
Project: Monitoring
Submitted Date/Time: 06/05/2020 16:35
Sampled by: Unknown
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-6)
Prep Batch Summary (Page 7)
Surrogates per Lab Sample (Pages 8-11)
Surrogates per QC Sample (Pages 12-15)
Batch QC Results (Pages 16-23)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S14611.01
Sample Tag: MW-19-124_060520
Collected Date/Time: 06/05/2020 12:05
Matrix: Groundwater
COC Reference: 124711

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 00:53	200610B9	VS200610W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14611.02

Sample Tag: MW-16-74_060520

Collected Date/Time: 06/05/2020 13:40

Matrix: Groundwater

COC Reference: 124711

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/16/20 15:13	200616B9	VS200616W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14611.03

Sample Tag: MW-16-81_060520

Collected Date/Time: 06/05/2020 14:45

Matrix: Groundwater

COC Reference: 124711

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 19:13	200611A9	VS200611W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 14:27	200609C7	VF200609W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14611.04

Sample Tag: MW-19-122_060520

Collected Date/Time: 06/05/2020 15:50

Matrix: Groundwater

COC Reference: 124711

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 01:37	200610B9	VS200610W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14611.05

Sample Tag: DUP-02_060520

Collected Date/Time: 06/05/2020 00:01

Matrix: Groundwater

COC Reference: 124711

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 19:35	200611A9	VS200611W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF200609W3

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14611.03	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 14:27	200609C7

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14611.01	1,4-Dioxane	SW8260B - SIM	06/11/20 00:53	200610B9
S14611.04	1,4-Dioxane	SW8260B - SIM	06/11/20 01:37	200610B9

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14611.03	1,4-Dioxane	SW8260B - SIM	06/11/20 19:13	200611A9
S14611.05	1,4-Dioxane	SW8260B - SIM	06/11/20 19:35	200611A9

Organics - Volatiles, Prep Batch ID: VS200616W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14611.02	1,4-Dioxane	SW8260B - SIM	06/16/20 15:13	200616B9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14611.01

Sample Tag: MW-19-124_060520

Collected Date/Time: 06/05/2020 12:05

Matrix: Groundwater

COC Reference: 124711

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/11/2020 00:53, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14611.03

Sample Tag: MW-16-81_060520

Collected Date/Time: 06/05/2020 14:45

Matrix: Groundwater

COC Reference: 124711

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 19:13, Matrix: WW, Dilution: 100

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200609C7, Run Date: 06/10/2020 14:27, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.1**	80.0	124.0
1,2-Dichloroethane-D4		**100.5**	72.0	125.0
Toluene-D8		**100.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14611.04

Sample Tag: MW-19-122_060520

Collected Date/Time: 06/05/2020 15:50

Matrix: Groundwater

COC Reference: 124711

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/11/2020 01:37, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14611.05

Sample Tag: DUP-02_060520

Collected Date/Time: 06/05/2020 00:01

Matrix: Groundwater

COC Reference: 124711

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 19:35, Matrix: WW, Dilution: 100

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VF200609W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.2**	80.0	124.0
1,2-Dichloroethane-D4		**99.9**	72.0	125.0
Toluene-D8		**99.7**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**98.1**	72.0	125.0
Toluene-D8		**101.2**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.6**	80.0	124.0
1,2-Dichloroethane-D4		**98.5**	72.0	125.0
Toluene-D8		**100.4**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200610W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200611W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200616W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200616B9.BLKW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 13:47, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:23, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200616B9.LCSDW16A, Parent Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:44, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VF200609W3

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

Blank (BLK)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		109.3	67.4	121.2
Acetone		109.2	29.9	161.5
Methyl iodide		107.8	68.8	116.4
Carbon disulfide		111.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		104.9	73.2	122.4
Acrylonitrile		105.2	69.9	128.9
2-Butanone (MEK)		96.7	44.0	134.4
Dichlorodifluoromethane		112.4	10.0	222.8
Chloromethane		110.6	23.8	166.5
Vinyl chloride		110.5	43.5	149.1
Bromomethane		100.5	56.8	151.3
Chloroethane		104.6	53.4	149.4
Trichlorofluoromethane		99.5	59.7	151.8
1,1-Dichloroethene		112.2	69.6	139.4
Methylene chloride		102.4	73.3	121.1
trans-1,2-Dichloroethene		110.8	73.6	129.3
1,1-Dichloroethane		111.0	71.5	126.2
cis-1,2-Dichloroethene		106.6	76.6	122.1
Tetrahydrofuran		102.9	59.0	117.9
Chloroform		107.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		105.5	78.2	120.8
1,1,1-Trichloroethane		106.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		101.0	71.6	125.2
2-Hexanone		103.7	55.4	136.9
Carbon tetrachloride		101.1	72.6	133.0
Benzene		108.6	79.9	124.9
1,2-Dichloroethane		99.9	76.0	126.3
Trichloroethene		108.1	79.7	124.2
1,2-Dichloropropane		108.2	78.6	126.4
Bromodichloromethane		103.3	80.4	128.2
Dibromomethane		100.9	76.9	122.1
cis-1,3-Dichloropropene		102.9	79.8	129.9
Toluene		108.5	79.8	124.5
trans-1,3-Dichloropropene		103.3	74.0	131.3
1,1,2-Trichloroethane		106.2	78.7	123.1
Tetrachloroethene	*	158.5	74.5	124.5
trans-1,4-Dichloro-2-butene		86.2	68.6	135.4
Dibromochloromethane		96.7	74.6	127.2
1,2-Dibromoethane		101.7	70.3	133.7
Chlorobenzene		102.5	79.2	122.7
1,1,1,2-Tetrachloroethane		96.0	80.3	128.2
Ethylbenzene		104.8	79.5	129.1
p,m-Xylene		102.7	79.4	132.2
o-Xylene		101.6	80.2	131.0
Styrene		102.7	69.5	126.7
Isopropylbenzene		102.7	74.4	121.5
Bromoform		92.0	69.4	128.0
1,1,2,2-Tetrachloroethane		96.0	79.8	126.3
1,2,3-Trichloropropane		98.7	78.3	138.8
n-Propylbenzene		103.5	82.0	130.7
Bromobenzene		98.5	78.7	124.6
1,3,5-Trimethylbenzene		99.7	81.3	128.9
tert-Butylbenzene		98.9	80.7	128.9
1,2,4-Trimethylbenzene		98.5	81.4	130.8
sec-Butylbenzene		103.6	77.4	129.8
p-Isopropyltoluene		102.7	79.8	137.5
1,3-Dichlorobenzene		99.5	77.0	131.3
1,4-Dichlorobenzene		100.5	20.7	137.7
1,2-Dichlorobenzene		101.0	10.0	166.2
1,2,3-Trimethylbenzene		100.2	76.3	124.2
n-Butylbenzene		100.1	80.0	133.3
Hexachloroethane		90.0	23.8	138.1
1,2-Dibromo-3-chloropropane		93.8	21.2	189.4
1,2,4-Trichlorobenzene		96.2	27.4	143.4
1,2,3-Trichlorobenzene		96.5	75.4	131.4
Naphthalene		98.8	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		95.5	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		106.4	67.4	121.2	2.7	30.0
Acetone		112.2	29.9	161.5	2.7	30.0
Methyl iodide		105.7	68.8	116.4	1.9	30.0
Carbon disulfide		108.1	63.8	137.4	3.3	30.0
tert-Methyl butyl ether (MTBE)		102.8	73.2	122.4	2.0	30.0
Acrylonitrile		103.6	69.9	128.9	1.5	30.0
2-Butanone (MEK)		96.6	44.0	134.4	0.1	30.0
Dichlorodifluoromethane		105.7	10.0	222.8	6.1	30.0
Chloromethane		106.9	23.8	166.5	3.3	30.0
Vinyl chloride		107.1	43.5	149.1	3.2	30.0
Bromomethane		97.5	56.8	151.3	3.0	30.0
Chloroethane		103.5	53.4	149.4	1.0	30.0
Trichlorofluoromethane		94.6	59.7	151.8	5.0	30.0
1,1-Dichloroethene		108.0	69.6	139.4	3.8	30.0
Methylene chloride		100.3	73.3	121.1	2.0	30.0
trans-1,2-Dichloroethene		107.1	73.6	129.3	3.3	30.0
1,1-Dichloroethane		107.7	71.5	126.2	2.9	30.0
cis-1,2-Dichloroethene		103.3	76.6	122.1	3.2	30.0
Tetrahydrofuran		104.4	59.0	117.9	1.4	30.0
Chloroform		104.6	78.4	124.0	2.4	30.0
Bromochloromethane		103.6	78.2	120.8	1.8	30.0
1,1,1-Trichloroethane		102.6	79.4	130.9	3.3	30.0
4-Methyl-2-pentanone (MIBK)		99.2	71.6	125.2	1.8	30.0
2-Hexanone		101.9	55.4	136.9	1.7	30.0
Carbon tetrachloride		97.3	72.6	133.0	3.9	30.0
Benzene		106.1	79.9	124.9	2.3	30.0
1,2-Dichloroethane		98.1	76.0	126.3	1.8	30.0
Trichloroethene		102.3	79.7	124.2	5.5	30.0
1,2-Dichloropropane		105.5	78.6	126.4	2.5	30.0
Bromodichloromethane		101.2	80.4	128.2	2.0	30.0
Dibromomethane		98.5	76.9	122.1	2.5	30.0
cis-1,3-Dichloropropene		100.0	79.8	129.9	2.9	30.0
Toluene		104.8	79.8	124.5	3.5	30.0
trans-1,3-Dichloropropene		99.7	74.0	131.3	3.5	30.0
1,1,2-Trichloroethane		103.2	78.7	123.1	2.9	30.0
Tetrachloroethene	*	103.4	74.5	124.5	42.0	30.0
trans-1,4-Dichloro-2-butene		84.6	68.6	135.4	1.9	30.0
Dibromochloromethane		95.3	74.6	127.2	1.5	30.0
1,2-Dibromoethane		99.8	70.3	133.7	1.8	30.0
Chlorobenzene		100.1	79.2	122.7	2.3	30.0

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		94.7	80.3	128.2	1.4	30.0
Ethylbenzene		102.6	79.5	129.1	2.2	30.0
p,m-Xylene		100.5	79.4	132.2	2.2	30.0
o-Xylene		100.4	80.2	131.0	1.1	30.0
Styrene		100.1	69.5	126.7	2.6	30.0
Isopropylbenzene		100.8	74.4	121.5	1.8	30.0
Bromoform		90.4	69.4	128.0	1.7	30.0
1,1,2,2-Tetrachloroethane		97.5	79.8	126.3	1.6	30.0
1,2,3-Trichloropropane		97.3	78.3	138.8	1.4	30.0
n-Propylbenzene		102.1	82.0	130.7	1.4	30.0
Bromobenzene		96.9	78.7	124.6	1.6	30.0
1,3,5-Trimethylbenzene		99.6	81.3	128.9	0.1	30.0
tert-Butylbenzene		98.5	80.7	128.9	0.4	30.0
1,2,4-Trimethylbenzene		97.7	81.4	130.8	0.9	30.0
sec-Butylbenzene		104.1	77.4	129.8	0.5	30.0
p-Isopropyltoluene		101.9	79.8	137.5	0.7	30.0
1,3-Dichlorobenzene		98.6	77.0	131.3	0.9	30.0
1,4-Dichlorobenzene		99.4	20.7	137.7	1.1	30.0
1,2-Dichlorobenzene		100.5	10.0	166.2	0.6	30.0
1,2,3-Trimethylbenzene		100.7	76.3	124.2	0.5	30.0
n-Butylbenzene		100.2	80.0	133.3	0.2	30.0
Hexachloroethane		90.7	23.8	138.1	0.8	30.0
1,2-Dibromo-3-chloropropane		94.0	21.2	189.4	0.2	30.0
1,2,4-Trichlorobenzene		96.7	27.4	143.4	0.5	30.0
1,2,3-Trichlorobenzene		97.5	75.4	131.4	1.1	30.0
Naphthalene		100.1	32.9	135.8	1.3	30.0
2-Methylnaphthalene		98.4	25.5	165.5	3.1	30.0

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		96.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.8	70.0	130.0	16.2	30.0

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.4	70.0	130.0	10.8	30.0

Organics - Volatiles, Prep Batch ID: VS200616W1

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

Blank (BLK)

Lab Sample ID: 200616B9.BLKW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 13:47, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:23, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		101.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200616B9.LCSDW16A, Parent Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:44, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.9	70.0	130.0	6.6	30.0

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C.O.C. PAGE # 1 OF 1

124711

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil Daniel Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Mike.spacil@arcadis.com daniel.stockard@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME:
SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

1,4-Dioxane 8260B SIM

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B SIM
14611.01	6/5/20	12:05	MW-19-124-060520	GW	3		3						X
.02	6/5/20	13:40	MW-16-74-060520	GW	3		3						X
.03	6/5/20	19:45	MW-16-81-060520	GW	3		3						X
.04	6/5/20	15:50	MW-19-122-060520	GW	3		3						X
.05	6/5/20		DUP-02	GW	3		3						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Daniel Stockard ☒ Sampler DATE: 6/5/20 TIME: 16:35
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Dropbox DATE: 6/5/20 TIME: 16:35
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box DATE: 6/5/2020 TIME: 1635
RECEIVED BY: SIGNATURE/ORGANIZATION: M Chilcote DATE: 6/5/2020 TIME: 1635

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES:
TEMP. ON ARRIVAL: 5.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18.12

Quality Control Report

Report ID: QC-S14650-01
Generated on 06/15/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14650.01-S14650.09
Project: Monitoring
Submitted Date/Time: 06/09/2020 08:15
Sampled by: Unknown
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-10)
Prep Batch Summary (Page 11)
Surrogates per Lab Sample (Pages 12-20)
Surrogates per QC Sample (Pages 21-23)
Batch QC Results (Pages 24-30)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S14650.01
Sample Tag: MW-14-63_060820
Collected Date/Time: 06/08/2020 09:15
Matrix: Groundwater
COC Reference: 128278

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 15:38	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S14650.02
Sample Tag: MW-16-80_060820
Collected Date/Time: 06/08/2020 10:40
Matrix: Groundwater
COC Reference: 128278

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 16:00	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S14650.03
Sample Tag: MW-15-73_060820
Collected Date/Time: 06/08/2020 12:15
Matrix: Groundwater
COC Reference: 128278

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 21:32	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S14650.04

Sample Tag: MW-12-18_060820

Collected Date/Time: 06/08/2020 11:35

Matrix: Groundwater

COC Reference: 128278

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 08:05	200609C7	VF200609W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14650.05

Sample Tag: MW-12-09_060820

Collected Date/Time: 06/08/2020 13:00

Matrix: Groundwater

COC Reference: 128278

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 16:22	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 08:24	200609C7	VF200609W3	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14650.06
Sample Tag: MW-16-83_060820
Collected Date/Time: 06/08/2020 13:40
Matrix: Groundwater
COC Reference: 128278

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 16:44	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S14650.07
Sample Tag: MW-13-51_060820
Collected Date/Time: 06/08/2020 15:20
Matrix: Groundwater
COC Reference: 128278

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 03:51	200610B9	VS200610W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14650.08

Sample Tag: MW-14-56_060820

Collected Date/Time: 06/08/2020 15:15

Matrix: Groundwater

COC Reference: 128278

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 04:14	200610B9	VS200610W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14650.09

Sample Tag: Trip Blank_060820

Collected Date/Time: 06/08/2020 00:01

Matrix: Water

COC Reference: 128278

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 06:28	200609C7	VF200609W3	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF200609W3

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14650.04	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 08:05	200609C7
S14650.05	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 08:24	200609C7
S14650.09	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 06:28	200609C7

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14650.07	1,4-Dioxane	SW8260B - SIM	06/11/20 03:51	200610B9
S14650.08	1,4-Dioxane	SW8260B - SIM	06/11/20 04:14	200610B9

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14650.01	1,4-Dioxane	SW8260B - SIM	06/12/20 15:38	200612A9
S14650.02	1,4-Dioxane	SW8260B - SIM	06/12/20 16:00	200612A9
S14650.03	1,4-Dioxane	SW8260B - SIM	06/12/20 21:32	200612A9
S14650.05	1,4-Dioxane	SW8260B - SIM	06/12/20 16:22	200612A9
S14650.06	1,4-Dioxane	SW8260B - SIM	06/12/20 16:44	200612A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14650.01

Sample Tag: MW-14-63_060820

Collected Date/Time: 06/08/2020 09:15

Matrix: Groundwater

COC Reference: 128278

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 15:38, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14650.02

Sample Tag: MW-16-80_060820

Collected Date/Time: 06/08/2020 10:40

Matrix: Groundwater

COC Reference: 128278

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 16:00, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14650.03

Sample Tag: MW-15-73_060820

Collected Date/Time: 06/08/2020 12:15

Matrix: Groundwater

COC Reference: 128278

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 21:32, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14650.04

Sample Tag: MW-12-18_060820

Collected Date/Time: 06/08/2020 11:35

Matrix: Groundwater

COC Reference: 128278

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200609C7, Run Date: 06/10/2020 08:05, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.8**	80.0	124.0
1,2-Dichloroethane-D4		**99.3**	72.0	125.0
Toluene-D8		**99.5**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14650.05

Sample Tag: MW-12-09_060820

Collected Date/Time: 06/08/2020 13:00

Matrix: Groundwater

COC Reference: 128278

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 16:22, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200609C7, Run Date: 06/10/2020 08:24, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.3**	80.0	124.0
1,2-Dichloroethane-D4		**99.5**	72.0	125.0
Toluene-D8		**99.1**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14650.06

Sample Tag: MW-16-83_060820

Collected Date/Time: 06/08/2020 13:40

Matrix: Groundwater

COC Reference: 128278

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 16:44, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14650.07

Sample Tag: MW-13-51_060820

Collected Date/Time: 06/08/2020 15:20

Matrix: Groundwater

COC Reference: 128278

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/11/2020 03:51, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14650.08

Sample Tag: MW-14-56_060820

Collected Date/Time: 06/08/2020 15:15

Matrix: Groundwater

COC Reference: 128278

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/11/2020 04:14, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14650.09

Sample Tag: Trip Blank_060820

Collected Date/Time: 06/08/2020 00:01

Matrix: Water

COC Reference: 128278

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200609C7, Run Date: 06/10/2020 06:28, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.4**	80.0	124.0
1,2-Dichloroethane-D4		**98.9**	72.0	125.0
Toluene-D8		**99.3**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200609W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.2**	80.0	124.0
1,2-Dichloroethane-D4		**99.9**	72.0	125.0
Toluene-D8		**99.7**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**98.1**	72.0	125.0
Toluene-D8		**101.2**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.6**	80.0	124.0
1,2-Dichloroethane-D4		**98.5**	72.0	125.0
Toluene-D8		**100.4**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200610W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200612W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)	*	**50.0**	60.0	140.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VF200609W3

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

Blank (BLK)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		109.3	67.4	121.2
Acetone		109.2	29.9	161.5
Methyl iodide		107.8	68.8	116.4
Carbon disulfide		111.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		104.9	73.2	122.4
Acrylonitrile		105.2	69.9	128.9
2-Butanone (MEK)		96.7	44.0	134.4
Dichlorodifluoromethane		112.4	10.0	222.8
Chloromethane		110.6	23.8	166.5
Vinyl chloride		110.5	43.5	149.1
Bromomethane		100.5	56.8	151.3
Chloroethane		104.6	53.4	149.4
Trichlorofluoromethane		99.5	59.7	151.8
1,1-Dichloroethene		112.2	69.6	139.4
Methylene chloride		102.4	73.3	121.1
trans-1,2-Dichloroethene		110.8	73.6	129.3
1,1-Dichloroethane		111.0	71.5	126.2
cis-1,2-Dichloroethene		106.6	76.6	122.1
Tetrahydrofuran		102.9	59.0	117.9
Chloroform		107.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		105.5	78.2	120.8
1,1,1-Trichloroethane		106.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		101.0	71.6	125.2
2-Hexanone		103.7	55.4	136.9
Carbon tetrachloride		101.1	72.6	133.0
Benzene		108.6	79.9	124.9
1,2-Dichloroethane		99.9	76.0	126.3
Trichloroethene		108.1	79.7	124.2
1,2-Dichloropropane		108.2	78.6	126.4
Bromodichloromethane		103.3	80.4	128.2
Dibromomethane		100.9	76.9	122.1
cis-1,3-Dichloropropene		102.9	79.8	129.9
Toluene		108.5	79.8	124.5
trans-1,3-Dichloropropene		103.3	74.0	131.3
1,1,2-Trichloroethane		106.2	78.7	123.1
Tetrachloroethene	*	158.5	74.5	124.5
trans-1,4-Dichloro-2-butene		86.2	68.6	135.4
Dibromochloromethane		96.7	74.6	127.2
1,2-Dibromoethane		101.7	70.3	133.7
Chlorobenzene		102.5	79.2	122.7
1,1,1,2-Tetrachloroethane		96.0	80.3	128.2
Ethylbenzene		104.8	79.5	129.1
p,m-Xylene		102.7	79.4	132.2
o-Xylene		101.6	80.2	131.0
Styrene		102.7	69.5	126.7
Isopropylbenzene		102.7	74.4	121.5
Bromoform		92.0	69.4	128.0
1,1,2,2-Tetrachloroethane		96.0	79.8	126.3
1,2,3-Trichloropropane		98.7	78.3	138.8
n-Propylbenzene		103.5	82.0	130.7
Bromobenzene		98.5	78.7	124.6
1,3,5-Trimethylbenzene		99.7	81.3	128.9
tert-Butylbenzene		98.9	80.7	128.9
1,2,4-Trimethylbenzene		98.5	81.4	130.8
sec-Butylbenzene		103.6	77.4	129.8
p-Isopropyltoluene		102.7	79.8	137.5
1,3-Dichlorobenzene		99.5	77.0	131.3
1,4-Dichlorobenzene		100.5	20.7	137.7
1,2-Dichlorobenzene		101.0	10.0	166.2
1,2,3-Trimethylbenzene		100.2	76.3	124.2
n-Butylbenzene		100.1	80.0	133.3
Hexachloroethane		90.0	23.8	138.1
1,2-Dibromo-3-chloropropane		93.8	21.2	189.4
1,2,4-Trichlorobenzene		96.2	27.4	143.4
1,2,3-Trichlorobenzene		96.5	75.4	131.4
Naphthalene		98.8	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		95.5	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		106.4	67.4	121.2	2.7	30.0
Acetone		112.2	29.9	161.5	2.7	30.0
Methyl iodide		105.7	68.8	116.4	1.9	30.0
Carbon disulfide		108.1	63.8	137.4	3.3	30.0
tert-Methyl butyl ether (MTBE)		102.8	73.2	122.4	2.0	30.0
Acrylonitrile		103.6	69.9	128.9	1.5	30.0
2-Butanone (MEK)		96.6	44.0	134.4	0.1	30.0
Dichlorodifluoromethane		105.7	10.0	222.8	6.1	30.0
Chloromethane		106.9	23.8	166.5	3.3	30.0
Vinyl chloride		107.1	43.5	149.1	3.2	30.0
Bromomethane		97.5	56.8	151.3	3.0	30.0
Chloroethane		103.5	53.4	149.4	1.0	30.0
Trichlorofluoromethane		94.6	59.7	151.8	5.0	30.0
1,1-Dichloroethene		108.0	69.6	139.4	3.8	30.0
Methylene chloride		100.3	73.3	121.1	2.0	30.0
trans-1,2-Dichloroethene		107.1	73.6	129.3	3.3	30.0
1,1-Dichloroethane		107.7	71.5	126.2	2.9	30.0
cis-1,2-Dichloroethene		103.3	76.6	122.1	3.2	30.0
Tetrahydrofuran		104.4	59.0	117.9	1.4	30.0
Chloroform		104.6	78.4	124.0	2.4	30.0
Bromochloromethane		103.6	78.2	120.8	1.8	30.0
1,1,1-Trichloroethane		102.6	79.4	130.9	3.3	30.0
4-Methyl-2-pentanone (MIBK)		99.2	71.6	125.2	1.8	30.0
2-Hexanone		101.9	55.4	136.9	1.7	30.0
Carbon tetrachloride		97.3	72.6	133.0	3.9	30.0
Benzene		106.1	79.9	124.9	2.3	30.0
1,2-Dichloroethane		98.1	76.0	126.3	1.8	30.0
Trichloroethene		102.3	79.7	124.2	5.5	30.0
1,2-Dichloropropane		105.5	78.6	126.4	2.5	30.0
Bromodichloromethane		101.2	80.4	128.2	2.0	30.0
Dibromomethane		98.5	76.9	122.1	2.5	30.0
cis-1,3-Dichloropropene		100.0	79.8	129.9	2.9	30.0
Toluene		104.8	79.8	124.5	3.5	30.0
trans-1,3-Dichloropropene		99.7	74.0	131.3	3.5	30.0
1,1,2-Trichloroethane		103.2	78.7	123.1	2.9	30.0
Tetrachloroethene	*	103.4	74.5	124.5	42.0	30.0
trans-1,4-Dichloro-2-butene		84.6	68.6	135.4	1.9	30.0
Dibromochloromethane		95.3	74.6	127.2	1.5	30.0
1,2-Dibromoethane		99.8	70.3	133.7	1.8	30.0
Chlorobenzene		100.1	79.2	122.7	2.3	30.0

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		94.7	80.3	128.2	1.4	30.0
Ethylbenzene		102.6	79.5	129.1	2.2	30.0
p,m-Xylene		100.5	79.4	132.2	2.2	30.0
o-Xylene		100.4	80.2	131.0	1.1	30.0
Styrene		100.1	69.5	126.7	2.6	30.0
Isopropylbenzene		100.8	74.4	121.5	1.8	30.0
Bromoform		90.4	69.4	128.0	1.7	30.0
1,1,2,2-Tetrachloroethane		97.5	79.8	126.3	1.6	30.0
1,2,3-Trichloropropane		97.3	78.3	138.8	1.4	30.0
n-Propylbenzene		102.1	82.0	130.7	1.4	30.0
Bromobenzene		96.9	78.7	124.6	1.6	30.0
1,3,5-Trimethylbenzene		99.6	81.3	128.9	0.1	30.0
tert-Butylbenzene		98.5	80.7	128.9	0.4	30.0
1,2,4-Trimethylbenzene		97.7	81.4	130.8	0.9	30.0
sec-Butylbenzene		104.1	77.4	129.8	0.5	30.0
p-Isopropyltoluene		101.9	79.8	137.5	0.7	30.0
1,3-Dichlorobenzene		98.6	77.0	131.3	0.9	30.0
1,4-Dichlorobenzene		99.4	20.7	137.7	1.1	30.0
1,2-Dichlorobenzene		100.5	10.0	166.2	0.6	30.0
1,2,3-Trimethylbenzene		100.7	76.3	124.2	0.5	30.0
n-Butylbenzene		100.2	80.0	133.3	0.2	30.0
Hexachloroethane		90.7	23.8	138.1	0.8	30.0
1,2-Dibromo-3-chloropropane		94.0	21.2	189.4	0.2	30.0
1,2,4-Trichlorobenzene		96.7	27.4	143.4	0.5	30.0
1,2,3-Trichlorobenzene		97.5	75.4	131.4	1.1	30.0
Naphthalene		100.1	32.9	135.8	1.3	30.0
2-Methylnaphthalene		98.4	25.5	165.5	3.1	30.0

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		96.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.8	70.0	130.0	16.2	30.0

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		94.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		105.0	70.0	130.0	10.7	30.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.4	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		111.3	70.0	130.0	7.2	30.0

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C.O.C. PAGE # 1 OF 1

128278

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: MIKE SPACIL / DAN STOCKARD
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR # 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO. FAX NO. P.O. NO.
E-MAIL ADDRESS: MICHAEL.SPACIL@ARCADIS.COM QUOTE NO.

INVOICE TO

CONTACT NAME X SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME SAMPLER(S) - PLEASE PRINT/SIGN NAME

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 DIOXANE By 8260B SIM	VOCs
14650.01	6/8/20	9:15	MW-14-63_060820	GW	3		3						X	
.02	6/8/20	10:40	MW-16-80_060820	GW	3		3						X	
.03	6/8/20	12:15	MW-15-73_060820	GW	3		3						X	
.04	6/8/20	11:35	MW-12-18_060820	GW	3		3							X
.05	6/8/20	13:00	MW-12-09_060820	GW	3		3						X	X
.06	6/8/20	13:40	MW-16-83_060820	GW	3		3						X	
.07	6/8/20	15:20	MW-13-51_060820	GW	3		3						X	
.08	6/8/20	1515	MW-14-56_060820	GW	3		3						X	
.09	6/8/20	—	TRIP BLANK_060820	W	1		1							X
	6/8/20													

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis	☒ Sampler	DATE 6/8/20	TIME 1550
RECEIVED BY: SIGNATURE/ORGANIZATION	Arcadis		DATE 6/8/20	TIME 15:50
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis		DATE 6/8/20	TIME 18:30
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox		DATE 6/8/20	TIME 18:30

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Dropbox		DATE 6/9/20	TIME 815
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE 6/9/20	TIME 815

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S14651-02
Generated on 07/07/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14651.01-S14651.10
Project: 30042872.04700 / RACER Lansing Plant 3
Submitted Date/Time: 06/09/2020 08:15
Sampled by: Austin Westhuis
P.O. #: 30042872.04700

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-11)
Prep Batch Summary (Page 12)
Surrogates per Lab Sample (Pages 13-21)
Surrogates per QC Sample (Pages 22-25)
Batch QC Results (Pages 26-43)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S14651.01

Sample Tag: MW-02-04(3)_060820

Collected Date/Time: 06/08/2020 10:35

Matrix: Groundwater

COC Reference: 128282

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Metals						
Arsenic	E200.8	06/12/20 10:55	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/12/20 10:55	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Copper	E200.8	06/12/20 10:55	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Lead	E200.8	06/12/20 10:55	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/12/20 10:55	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/12/20 10:55	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 04:36	200610B9	VS200610W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14651.02

Sample Tag: MW-18-97_060820

Collected Date/Time: 06/08/2020 12:15

Matrix: Groundwater

COC Reference: 128282

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 04:58	200610B9	VS200610W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14651.03

Sample Tag: MW-18-94_060820

Collected Date/Time: 06/08/2020 13:40

Matrix: Groundwater

COC Reference: 128282

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 05:20	200610B9	VS200610W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14651.04

Sample Tag: CH-14-RO_060820

Collected Date/Time: 06/08/2020 15:55

Matrix: Groundwater

COC Reference: 128282

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chromium VI	SM3500-Cr B	06/09/20 15:20	CHR200609-W1	CHR200609-W1	No	BLK/LCS/MS/DUP
Metals						
Arsenic	E200.8	06/12/20 10:58	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/12/20 10:58	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Copper	E200.8	06/12/20 10:58	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Lead	E200.8	06/12/20 10:58	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/12/20 10:58	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/12/20 10:58	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD

Lab Sample ID: S14651.05

Sample Tag: UNK-11_060820

Collected Date/Time: 06/08/2020 09:50

Matrix: Groundwater

COC Reference: 128282

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 15:23	P200615	SF200612W01	Yes	BLK/LCS/LCSD
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 14:22	200610A3	VF200610W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14651.06
Sample Tag: UNK-10_060820
Collected Date/Time: 06/08/2020 11:00
Matrix: Groundwater
COC Reference: 128282

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 08:43	200609C7	VF200609W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14651.07
Sample Tag: P3-SB-28_060820
Collected Date/Time: 06/08/2020 12:15
Matrix: Groundwater
COC Reference: 128282

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 15:53	P200615	SF200612W01	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14651.08
Sample Tag: MW-05(3)_060820
Collected Date/Time: 06/08/2020 14:15
Matrix: Groundwater
COC Reference: 128282

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 09:03	200609C7	VF200609W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14651.09

Sample Tag: MW-13-32_060820

Collected Date/Time: 06/08/2020 15:45

Matrix: Groundwater

COC Reference: 128282

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Metals						
Arsenic	E200.8	06/12/20 11:00	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/12/20 11:00	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Copper	E200.8	06/12/20 11:00	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Lead	E200.8	06/12/20 11:00	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/12/20 11:00	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/12/20 11:00	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 16:24	P200615	SF200612W01	Yes	BLK/LCS/LCSD

Lab Sample ID: S14651.10

Sample Tag: Trip Blank_060820

Collected Date/Time: 06/08/2020 00:01

Matrix: Water

COC Reference: 128282

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 06:47	200609C7	VF200609W3	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: CHR200609-W1

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14651.04	Chromium VI	SM3500-Cr B	06/09/20 15:20	CHR200609-W1

Metals, Prep Batch ID: MTD-061220-1

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14651.01	Arsenic	E200.8	06/12/20 10:55	MT5-20-0612A
S14651.01	Chromium	E200.8	06/12/20 10:55	MT5-20-0612A
S14651.01	Copper	E200.8	06/12/20 10:55	MT5-20-0612A
S14651.01	Lead	E200.8	06/12/20 10:55	MT5-20-0612A
S14651.01	Nickel	E200.8	06/12/20 10:55	MT5-20-0612A
S14651.01	Vanadium	E200.8	06/12/20 10:55	MT5-20-0612A
S14651.04	Arsenic	E200.8	06/12/20 10:58	MT5-20-0612A
S14651.04	Chromium	E200.8	06/12/20 10:58	MT5-20-0612A
S14651.04	Copper	E200.8	06/12/20 10:58	MT5-20-0612A
S14651.04	Lead	E200.8	06/12/20 10:58	MT5-20-0612A
S14651.04	Nickel	E200.8	06/12/20 10:58	MT5-20-0612A
S14651.04	Vanadium	E200.8	06/12/20 10:58	MT5-20-0612A
S14651.09	Arsenic	E200.8	06/12/20 11:00	MT5-20-0612A
S14651.09	Chromium	E200.8	06/12/20 11:00	MT5-20-0612A
S14651.09	Copper	E200.8	06/12/20 11:00	MT5-20-0612A
S14651.09	Lead	E200.8	06/12/20 11:00	MT5-20-0612A
S14651.09	Nickel	E200.8	06/12/20 11:00	MT5-20-0612A
S14651.09	Vanadium	E200.8	06/12/20 11:00	MT5-20-0612A

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14651.05	Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 15:23	P200615
S14651.07	Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 15:53	P200615
S14651.09	Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 16:24	P200615

Organics - Volatiles, Prep Batch ID: VF200609W3

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14651.06	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 08:43	200609C7
S14651.08	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 09:03	200609C7
S14651.10	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 06:47	200609C7

Organics - Volatiles, Prep Batch ID: VF200610W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14651.05	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 14:22	200610A3

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14651.01	1,4-Dioxane	SW8260B - SIM	06/11/20 04:36	200610B9
S14651.02	1,4-Dioxane	SW8260B - SIM	06/11/20 04:58	200610B9
S14651.03	1,4-Dioxane	SW8260B - SIM	06/11/20 05:20	200610B9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14651.01

Sample Tag: MW-02-04(3)_060820

Collected Date/Time: 06/08/2020 10:35

Matrix: Groundwater

COC Reference: 128282

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/11/2020 04:36, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14651.02

Sample Tag: MW-18-97_060820

Collected Date/Time: 06/08/2020 12:15

Matrix: Groundwater

COC Reference: 128282

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/11/2020 04:58, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14651.03

Sample Tag: MW-18-94_060820

Collected Date/Time: 06/08/2020 13:40

Matrix: Groundwater

COC Reference: 128282

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/11/2020 05:20, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Lab Sample ID: S14651.05

Sample Tag: UNK-11_060820

Collected Date/Time: 06/08/2020 09:50

Matrix: Groundwater

COC Reference: 128282

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200615, Run Date: 06/15/2020 15:23, Matrix: WW, Dilution: 2

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**50.3**	10.0	110.0
Phenol-D5		**36.6**	10.0	110.0
Nitrobenzene-D5		**86.0**	10.0	114.0
2-Fluorobiphenyl		**92.4**	10.0	116.0
2,4,6-Tribromophenol		**87.6**	10.0	123.0
Terphenyl-D14		**87.8**	10.0	141.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200610A3, Run Date: 06/10/2020 14:22, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**91.2**	80.0	124.0
1,2-Dichloroethane-D4		**113.2**	72.0	125.0
Toluene-D8		**94.4**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14651.06

Sample Tag: UNK-10_060820

Collected Date/Time: 06/08/2020 11:00

Matrix: Groundwater

COC Reference: 128282

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200609C7, Run Date: 06/10/2020 08:43, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.4**	80.0	124.0
1,2-Dichloroethane-D4		**101.7**	72.0	125.0
Toluene-D8		**100.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14651.07

Sample Tag: P3-SB-28_060820

Collected Date/Time: 06/08/2020 12:15

Matrix: Groundwater

COC Reference: 128282

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200615, Run Date: 06/15/2020 15:53, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**52.6**	10.0	110.0
Phenol-D5		**37.7**	10.0	110.0
Nitrobenzene-D5		**89.4**	10.0	114.0
2-Fluorobiphenyl		**100.8**	10.0	116.0
2,4,6-Tribromophenol		**98.5**	10.0	123.0
Terphenyl-D14		**100.8**	10.0	141.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14651.08

Sample Tag: MW-05(3)_060820

Collected Date/Time: 06/08/2020 14:15

Matrix: Groundwater

COC Reference: 128282

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200609C7, Run Date: 06/10/2020 09:03, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**97.7**	72.0	125.0
Toluene-D8		**100.7**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14651.09

Sample Tag: MW-13-32_060820

Collected Date/Time: 06/08/2020 15:45

Matrix: Groundwater

COC Reference: 128282

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200615, Run Date: 06/15/2020 16:24, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**49.2**	10.0	110.0
Phenol-D5		**34.8**	10.0	110.0
Nitrobenzene-D5		**83.5**	10.0	114.0
2-Fluorobiphenyl		**92.6**	10.0	116.0
2,4,6-Tribromophenol		**83.2**	10.0	123.0
Terphenyl-D14		**86.0**	10.0	141.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14651.10

Sample Tag: Trip Blank_060820

Collected Date/Time: 06/08/2020 00:01

Matrix: Water

COC Reference: 128282

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200609C7, Run Date: 06/10/2020 06:47, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.9**	80.0	124.0
1,2-Dichloroethane-D4		**101.3**	72.0	125.0
Toluene-D8		**99.6**	89.0	112.0

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: P200615.BLKW12A

Run in Batch: P200615, Run Date: 06/15/2020 13:52, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**50.3**	10.0	110.0
Phenol-D5		**35.7**	10.0	110.0
Nitrobenzene-D5		**87.9**	10.0	114.0
2-Fluorobiphenyl		**91.1**	10.0	116.0
2,4,6-Tribromophenol		**88.2**	10.0	123.0
Terphenyl-D14		**85.6**	10.0	141.0

Laboratory Control Sample (LCS)

Lab Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:22, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**54.0**	10.0	110.0
Phenol-D5		**38.5**	10.0	110.0
Nitrobenzene-D5		**94.8**	10.0	114.0
2-Fluorobiphenyl		**103.0**	10.0	116.0
2,4,6-Tribromophenol		**97.2**	10.0	123.0
Terphenyl-D14		**92.3**	10.0	141.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200615.LCSDW12A, Parent Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:53, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**54.4**	10.0	110.0
Phenol-D5		**38.9**	10.0	110.0
Nitrobenzene-D5		**94.6**	10.0	114.0
2-Fluorobiphenyl		**101.0**	10.0	116.0
2,4,6-Tribromophenol		**99.4**	10.0	123.0
Terphenyl-D14		**94.5**	10.0	141.0

Organics - Volatiles, Prep Batch ID: VF200609W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.2**	80.0	124.0
1,2-Dichloroethane-D4		**99.9**	72.0	125.0
Toluene-D8		**99.7**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**98.1**	72.0	125.0
Toluene-D8		**101.2**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.6**	80.0	124.0
1,2-Dichloroethane-D4		**98.5**	72.0	125.0
Toluene-D8		**100.4**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200610W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**88.2**	80.0	124.0
1,2-Dichloroethane-D4		**105.6**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.6**	80.0	124.0
1,2-Dichloroethane-D4		**101.8**	72.0	125.0
Toluene-D8		**101.0**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**99.8**	80.0	124.0
1,2-Dichloroethane-D4		**104.8**	72.0	125.0
Toluene-D8		**100.6**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200610W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Inorganics, Prep Batch ID: CHR200609-W1

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: CHR200609-W1.LRB1

Run in Batch: CHR200609-W1, Run Date: 06/09/2020 15:00, Prep Date: 06/09/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Chromium VI		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: CHR200609-W1.LCS1

Run in Batch: CHR200609-W1, Run Date: 06/09/2020 15:15, Prep Date: 06/09/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Chromium VI		105	90	110

Matrix Spike (MS)

Lab Sample ID: CHR200609-W1.MS1, Parent Sample ID: S14651.04

Run in Batch: CHR200609-W1, Run Date: 06/09/2020 15:30, Prep Date: 06/09/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Chromium VI		93	80	120

Duplicate (DUP)

Lab Sample ID: CHR200609-W1.DP1, Parent Sample ID: S14651.04

Run in Batch: CHR200609-W1, Run Date: 06/09/2020 15:25, Prep Date: 06/09/2020, Matrix: Liquid, Dilution: 25

Analyte	Flags	RPD	RPD CL
Chromium VI		1	15

Metals, Prep Batch ID: MTD-061220-1

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Blank (BLK)

Lab Sample ID: MT5-20-0612A.021.LRB

Run in Batch: MT5-20-0612A, Run Date: 06/12/2020 10:52, Prep Date: 06/12/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Arsenic		ND	0.0004	mg/L
Chromium		ND	0.001	mg/L
Copper		ND	0.001	mg/L
Lead		ND	0.0006	mg/L
Nickel		ND	0.001	mg/L
Vanadium		ND	0.001	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: MT5-20-0612A.020.LCS

Run in Batch: MT5-20-0612A, Run Date: 06/12/2020 10:51, Prep Date: 06/12/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Arsenic		105	85	115
Chromium		102	85	115
Copper		106	85	115
Lead		98	85	115
Nickel		105	85	115
Vanadium		103	85	115

Matrix Spike (MS)

Lab Sample ID: MT5-20-0612A.032.MS, Parent Sample ID: S14704.01

Run in Batch: MT5-20-0612A, Run Date: 06/12/2020 11:06, Prep Date: 06/12/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Arsenic		104	75	125
Chromium		104	75	125
Copper		101	75	125
Lead		94	75	125
Nickel		102	75	125
Vanadium		107	75	125

Matrix Spike Duplicate (MSD)

Lab Sample ID: MT5-20-0612A.033.MSD, Parent Sample ID: MT5-20-0612A.032.MS

Run in Batch: MT5-20-0612A, Run Date: 06/12/2020 11:07, Prep Date: 06/12/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Arsenic		104	75	125	0	20
Chromium		103	75	125	0	20
Copper		100	75	125	1	20
Lead		94	75	125	0	20
Nickel		99	75	125	3	20
Vanadium		104	75	125	3	20

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01

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

Blank (BLK)

Lab Sample ID: P200615.BLKW12A

Run in Batch: P200615, Run Date: 06/15/2020 13:52, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acenaphthene		ND	0.00050	mg/l
Acenaphthylene		ND	0.00050	mg/l
Anthracene		ND	0.00050	mg/l
Benzo(a)anthracene		ND	0.00050	mg/l
Benzo(b)fluoranthene		ND	0.00050	mg/l
Benzo(k)fluoranthene		ND	0.00050	mg/l
Benzo(ghi)perylene		ND	0.00050	mg/l
Benzo(a)pyrene		ND	0.00050	mg/l
bis(2-Chloroethoxy)methane		ND	0.00050	mg/l
bis(2-Chloroethyl)ether		ND	0.00050	mg/l
bis(2-Chloroisopropyl)ether		ND	0.00050	mg/l
bis(2-Ethylhexyl)phthalate		ND	0.00050	mg/l
4-Bromophenyl phenyl ether		ND	0.00050	mg/l
Butyl benzyl phthalate		ND	0.00050	mg/l
4-Chloroaniline		ND	0.00050	mg/l
2-Chloronaphthalene		ND	0.00050	mg/l
4-Chloro-3-methylphenol		ND	0.00050	mg/l
2-Chlorophenol		ND	0.00050	mg/l
4-Chlorophenyl phenyl ether		ND	0.00050	mg/l
Chrysene		ND	0.00050	mg/l
3-, 4-Methylphenol (p,m-Cresol)		ND	0.00100	mg/l
2-Methylphenol (o-Cresol)		ND	0.00050	mg/l
Dibenzo(ah)anthracene		ND	0.00050	mg/l
Dibenzofuran		ND	0.00050	mg/l
di-n-Butyl phthalate	*	0.00059	0.00050	mg/l
1,2-Dichlorobenzene		ND	0.00050	mg/l
1,3-Dichlorobenzene		ND	0.00050	mg/l
1,4-Dichlorobenzene		ND	0.00050	mg/l
3,3'-Dichlorobenzidine		ND	0.00050	mg/l
2,4-Dichlorophenol		ND	0.00050	mg/l
Diethyl phthalate		ND	0.00050	mg/l
2,4-Dimethylphenol		ND	0.00050	mg/l
Dimethyl phthalate		ND	0.00050	mg/l
4,6-Dinitro-2-methylphenol		ND	0.00050	mg/l
2,4-Dinitrophenol		ND	0.00050	mg/l
2,4-Dinitrotoluene		ND	0.00050	mg/l
2,6-Dinitrotoluene		ND	0.00050	mg/l
1,2-Diphenylhydrazine		ND	0.00050	mg/l
di-n-Octyl phthalate		ND	0.00050	mg/l
Fluoranthene		ND	0.00050	mg/l
Fluorene		ND	0.00050	mg/l
Hexachlorobenzene		ND	0.00050	mg/l
Hexachlorobutadiene		ND	0.00050	mg/l
Hexachlorocyclopentadiene		ND	0.00050	mg/l
Hexachloroethane		ND	0.00050	mg/l
Indeno(1,2,3-cd)pyrene		ND	0.00050	mg/l

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: P200615.BLKW12A

Run in Batch: P200615, Run Date: 06/15/2020 13:52, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Isophorone		ND	0.00050	mg/l
2-Methylnaphthalene		ND	0.00050	mg/l
Naphthalene		ND	0.00050	mg/l
2-Nitroaniline		ND	0.00050	mg/l
3-Nitroaniline		ND	0.00050	mg/l
4-Nitroaniline		ND	0.00050	mg/l
Nitrobenzene		ND	0.00050	mg/l
2-Nitrophenol		ND	0.00050	mg/l
4-Nitrophenol		ND	0.00050	mg/l
N-Nitrosodiphenylamine		ND	0.00050	mg/l
N-Nitrosodi-n-propylamine		ND	0.00050	mg/l
Pentachlorophenol		ND	0.00050	mg/l
Phenanthrene		ND	0.00050	mg/l
Phenol		ND	0.00050	mg/l
Pyrene		ND	0.00050	mg/l
1,2,4-Trichlorobenzene		ND	0.00050	mg/l
2,4,5-Trichlorophenol		ND	0.00050	mg/l
2,4,6-Trichlorophenol		ND	0.00050	mg/l

Laboratory Control Sample (LCS)

Lab Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:22, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		87.7	37.82	102.82
Acenaphthylene		95.8	34.75	114.76
Anthracene		87.8	38.29	107.17
Benzo(a)anthracene		89.2	39.45	103.23
Benzo(b)fluoranthene		95.9	39.3	105.62
Benzo(k)fluoranthene		93.5	37.32	99.27
Benzo(ghi)perylene		92.2	25.65	121.02
Benzo(a)pyrene		95.9	41	102.98
bis(2-Chloroethoxy)methane		82.5	38.96	94.94
bis(2-Chloroethyl)ether		71.3	32.79	92.32
bis(2-Chloroisopropyl)ether		61.7	28.96	95.55
bis(2-Ethylhexyl)phthalate		77.7	43.38	102.89
4-Bromophenyl phenyl ether		87.3	36.32	111.95
Butyl benzyl phthalate		79.9	41.29	98.17
4-Chloroaniline		60.0	11.53	72.6
2-Chloronaphthalene		85.6	36.7	102.59
4-Chloro-3-methylphenol		82.6	39.63	104.28
2-Chlorophenol		77.6	34.18	94.55
4-Chlorophenyl phenyl ether		86.5	38.63	115.88
Chrysene		94.6	42.42	104.5
3-, 4-Methylphenol (p,m-Cresol)		59.2	36.4	115.4
2-Methylphenol (o-Cresol)		67.4	37.3	120.0
Dibenzo(ah)anthracene		82.6	31.37	119.17

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:22, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Dibenzofuran		90.9	40.25	104.89
di-n-Butyl phthalate		83.4	42.66	109.16
1,2-Dichlorobenzene		63.9	35.29	149.51
1,3-Dichlorobenzene		60.5	32.15	155.22
1,4-Dichlorobenzene		61.6	33.22	151.25
3,3'-Dichlorobenzidine		78.2	26.1	103.71
2,4-Dichlorophenol		86.0	41.58	98.03
Diethyl phthalate		83.1	43.35	109.88
2,4-Dimethylphenol		84.6	39.69	104.6
Dimethyl phthalate		88.5	44.99	102.98
4,6-Dinitro-2-methylphenol		77.9	19.98	101.32
2,4-Dinitrophenol		67.1	10	109.59
2,4-Dinitrotoluene		90.5	37.33	115.88
2,6-Dinitrotoluene		91.3	41.24	106.63
1,2-Diphenylhydrazine		83.9	39.95	95.79
di-n-Octyl phthalate		93.6	38.19	107.3
Fluoranthene		89.7	39.79	106.64
Fluorene		89.6	36.94	108.4
Hexachlorobenzene		89.3	34.37	118.98
Hexachlorobutadiene		61.2	16.99	122.89
Hexachlorocyclopentadiene		81.3	21.56	132.1
Hexachloroethane		52.3	22.96	157.68
Indeno(1,2,3-cd)pyrene		88.7	29.55	116.59
Isophorone		84.8	33.67	101.86
2-Methylnaphthalene		75.5	29.6	140.3
Naphthalene		76.1	31.37	140.54
2-Nitroaniline		94.1	41.37	98.69
3-Nitroaniline		73.0	22.05	86.36
4-Nitroaniline		89.5	31.15	107.83
Nitrobenzene		75.1	38.21	124.16
2-Nitrophenol		85.1	38.56	92.8
4-Nitrophenol		49.6	13.39	116.72
N-Nitrosodiphenylamine		92.5	33.26	108.23
N-Nitrosodi-n-propylamine		78.4	32.25	95.51
Pentachlorophenol		60.7	17.09	112.61
Phenanthrene		87.2	37.67	105.05
Phenol		35.1	10	103.25
Pyrene		98.8	38.69	102.69
1,2,4-Trichlorobenzene		70.0	39.12	156.7
2,4,5-Trichlorophenol		92.9	38.05	112.24
2,4,6-Trichlorophenol		88.8	38.38	108.99

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200615.LCSDW12A, Parent Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:53, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		86.1	37.82	102.82	1.8	30.0
Acenaphthylene		94.7	34.75	114.76	1.1	30.0
Anthracene		88.1	38.29	107.17	0.4	30.0
Benzo(a)anthracene		91.7	39.45	103.23	2.8	30.0
Benzo(b)fluoranthene		94.6	39.3	105.62	1.4	30.0
Benzo(k)fluoranthene		94.6	37.32	99.27	1.2	30.0
Benzo(ghi)perylene		91.6	25.65	121.02	0.6	30.0
Benzo(a)pyrene		94.9	41	102.98	1.1	30.0
bis(2-Chloroethoxy)methane		81.9	38.96	94.94	0.8	30.0
bis(2-Chloroethyl)ether		73.4	32.79	92.32	2.8	30.0
bis(2-Chloroisopropyl)ether		62.0	28.96	95.55	0.4	30.0
bis(2-Ethylhexyl)phthalate		79.1	43.38	102.89	1.8	30.0
4-Bromophenyl phenyl ether		89.0	36.32	111.95	2.0	30.0
Butyl benzyl phthalate		82.0	41.29	98.17	2.5	30.0
4-Chloroaniline		60.0	11.53	72.6	0.1	30.0
2-Chloronaphthalene		84.5	36.7	102.59	1.3	30.0
4-Chloro-3-methylphenol		81.9	39.63	104.28	0.9	30.0
2-Chlorophenol		78.9	34.18	94.55	1.6	30.0
4-Chlorophenyl phenyl ether		84.8	38.63	115.88	2.0	30.0
Chrysene		93.6	42.42	104.5	1.1	30.0
3-, 4-Methylphenol (p,m-Cresol)		59.1	36.4	115.4	0.2	30.0
2-Methylphenol (o-Cresol)		68.5	37.3	120.0	1.6	30.0
Dibenzo(ah)anthracene		85.7	31.37	119.17	3.7	30.0
Dibenzofuran		87.5	40.25	104.89	3.8	30.0
di-n-Butyl phthalate		82.9	42.66	109.16	0.6	30.0
1,2-Dichlorobenzene		65.3	35.29	149.51	2.1	30.0
1,3-Dichlorobenzene		59.6	32.15	155.22	1.6	30.0
1,4-Dichlorobenzene		61.0	33.22	151.25	1.0	30.0
3,3'-Dichlorobenzidine		76.7	26.1	103.71	1.9	30.0
2,4-Dichlorophenol		82.9	41.58	98.03	3.6	30.0
Diethyl phthalate		83.8	43.35	109.88	0.9	30.0
2,4-Dimethylphenol		82.3	39.69	104.6	2.8	30.0
Dimethyl phthalate		88.1	44.99	102.98	0.4	30.0
4,6-Dinitro-2-methylphenol		79.1	19.98	101.32	1.6	30.0
2,4-Dinitrophenol		70.7	10	109.59	5.3	30.0
2,4-Dinitrotoluene		90.1	37.33	115.88	0.4	30.0
2,6-Dinitrotoluene		91.7	41.24	106.63	0.5	30.0
1,2-Diphenylhydrazine		84.9	39.95	95.79	1.2	30.0
di-n-Octyl phthalate		92.0	38.19	107.3	1.7	30.0
Fluoranthene		88.5	39.79	106.64	1.3	30.0
Fluorene		89.8	36.94	108.4	0.2	30.0
Hexachlorobenzene		92.5	34.37	118.98	3.5	30.0
Hexachlorobutadiene		59.4	16.99	122.89	3.0	30.0
Hexachlorocyclopentadiene		79.5	21.56	132.1	2.2	30.0
Hexachloroethane		52.6	22.96	157.68	0.5	30.0
Indeno(1,2,3-cd)pyrene		89.7	29.55	116.59	1.1	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: P200615.LCSDW12A, Parent Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:53, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isophorone		84.2	33.67	101.86	0.7	30.0
2-Methylnaphthalene		75.4	29.6	140.3	0.2	30.0
Naphthalene		74.8	31.37	140.54	1.8	30.0
2-Nitroaniline		91.7	41.37	98.69	2.5	30.0
3-Nitroaniline		73.3	22.05	86.36	0.4	30.0
4-Nitroaniline		88.6	31.15	107.83	1.1	30.0
Nitrobenzene		74.1	38.21	124.16	1.4	30.0
2-Nitrophenol		85.0	38.56	92.8	0.2	30.0
4-Nitrophenol		49.9	13.39	116.72	0.7	30.0
N-Nitrosodiphenylamine		94.2	33.26	108.23	1.9	30.0
N-Nitrosodi-n-propylamine		79.5	32.25	95.51	1.5	30.0
Pentachlorophenol		63.6	17.09	112.61	4.6	30.0
Phenanthrene		89.5	37.67	105.05	2.5	30.0
Phenol		35.8	10	103.25	2.0	30.0
Pyrene		99.6	38.69	102.69	0.8	30.0
1,2,4-Trichlorobenzene		68.3	39.12	156.7	2.4	30.0
2,4,5-Trichlorophenol		95.7	38.05	112.24	2.9	30.0
2,4,6-Trichlorophenol		90.1	38.38	108.99	1.4	30.0

Organics - Volatiles, Prep Batch ID: VF200609W3

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

Blank (BLK)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		109.3	67.4	121.2
Acetone		109.2	29.9	161.5
Methyl iodide		107.8	68.8	116.4
Carbon disulfide		111.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		104.9	73.2	122.4
Acrylonitrile		105.2	69.9	128.9
2-Butanone (MEK)		96.7	44.0	134.4
Dichlorodifluoromethane		112.4	10.0	222.8
Chloromethane		110.6	23.8	166.5
Vinyl chloride		110.5	43.5	149.1
Bromomethane		100.5	56.8	151.3
Chloroethane		104.6	53.4	149.4
Trichlorofluoromethane		99.5	59.7	151.8
1,1-Dichloroethene		112.2	69.6	139.4
Methylene chloride		102.4	73.3	121.1
trans-1,2-Dichloroethene		110.8	73.6	129.3
1,1-Dichloroethane		111.0	71.5	126.2
cis-1,2-Dichloroethene		106.6	76.6	122.1
Tetrahydrofuran		102.9	59.0	117.9
Chloroform		107.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		105.5	78.2	120.8
1,1,1-Trichloroethane		106.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		101.0	71.6	125.2
2-Hexanone		103.7	55.4	136.9
Carbon tetrachloride		101.1	72.6	133.0
Benzene		108.6	79.9	124.9
1,2-Dichloroethane		99.9	76.0	126.3
Trichloroethene		108.1	79.7	124.2
1,2-Dichloropropane		108.2	78.6	126.4
Bromodichloromethane		103.3	80.4	128.2
Dibromomethane		100.9	76.9	122.1
cis-1,3-Dichloropropene		102.9	79.8	129.9
Toluene		108.5	79.8	124.5
trans-1,3-Dichloropropene		103.3	74.0	131.3
1,1,2-Trichloroethane		106.2	78.7	123.1
Tetrachloroethene	*	158.5	74.5	124.5
trans-1,4-Dichloro-2-butene		86.2	68.6	135.4
Dibromochloromethane		96.7	74.6	127.2
1,2-Dibromoethane		101.7	70.3	133.7
Chlorobenzene		102.5	79.2	122.7
1,1,1,2-Tetrachloroethane		96.0	80.3	128.2
Ethylbenzene		104.8	79.5	129.1
p,m-Xylene		102.7	79.4	132.2
o-Xylene		101.6	80.2	131.0
Styrene		102.7	69.5	126.7
Isopropylbenzene		102.7	74.4	121.5
Bromoform		92.0	69.4	128.0
1,1,2,2-Tetrachloroethane		96.0	79.8	126.3
1,2,3-Trichloropropane		98.7	78.3	138.8
n-Propylbenzene		103.5	82.0	130.7
Bromobenzene		98.5	78.7	124.6
1,3,5-Trimethylbenzene		99.7	81.3	128.9
tert-Butylbenzene		98.9	80.7	128.9
1,2,4-Trimethylbenzene		98.5	81.4	130.8
sec-Butylbenzene		103.6	77.4	129.8
p-Isopropyltoluene		102.7	79.8	137.5
1,3-Dichlorobenzene		99.5	77.0	131.3
1,4-Dichlorobenzene		100.5	20.7	137.7
1,2-Dichlorobenzene		101.0	10.0	166.2
1,2,3-Trimethylbenzene		100.2	76.3	124.2
n-Butylbenzene		100.1	80.0	133.3
Hexachloroethane		90.0	23.8	138.1
1,2-Dibromo-3-chloropropane		93.8	21.2	189.4
1,2,4-Trichlorobenzene		96.2	27.4	143.4
1,2,3-Trichlorobenzene		96.5	75.4	131.4
Naphthalene		98.8	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		95.5	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		106.4	67.4	121.2	2.7	30.0
Acetone		112.2	29.9	161.5	2.7	30.0
Methyl iodide		105.7	68.8	116.4	1.9	30.0
Carbon disulfide		108.1	63.8	137.4	3.3	30.0
tert-Methyl butyl ether (MTBE)		102.8	73.2	122.4	2.0	30.0
Acrylonitrile		103.6	69.9	128.9	1.5	30.0
2-Butanone (MEK)		96.6	44.0	134.4	0.1	30.0
Dichlorodifluoromethane		105.7	10.0	222.8	6.1	30.0
Chloromethane		106.9	23.8	166.5	3.3	30.0
Vinyl chloride		107.1	43.5	149.1	3.2	30.0
Bromomethane		97.5	56.8	151.3	3.0	30.0
Chloroethane		103.5	53.4	149.4	1.0	30.0
Trichlorofluoromethane		94.6	59.7	151.8	5.0	30.0
1,1-Dichloroethene		108.0	69.6	139.4	3.8	30.0
Methylene chloride		100.3	73.3	121.1	2.0	30.0
trans-1,2-Dichloroethene		107.1	73.6	129.3	3.3	30.0
1,1-Dichloroethane		107.7	71.5	126.2	2.9	30.0
cis-1,2-Dichloroethene		103.3	76.6	122.1	3.2	30.0
Tetrahydrofuran		104.4	59.0	117.9	1.4	30.0
Chloroform		104.6	78.4	124.0	2.4	30.0
Bromochloromethane		103.6	78.2	120.8	1.8	30.0
1,1,1-Trichloroethane		102.6	79.4	130.9	3.3	30.0
4-Methyl-2-pentanone (MIBK)		99.2	71.6	125.2	1.8	30.0
2-Hexanone		101.9	55.4	136.9	1.7	30.0
Carbon tetrachloride		97.3	72.6	133.0	3.9	30.0
Benzene		106.1	79.9	124.9	2.3	30.0
1,2-Dichloroethane		98.1	76.0	126.3	1.8	30.0
Trichloroethene		102.3	79.7	124.2	5.5	30.0
1,2-Dichloropropane		105.5	78.6	126.4	2.5	30.0
Bromodichloromethane		101.2	80.4	128.2	2.0	30.0
Dibromomethane		98.5	76.9	122.1	2.5	30.0
cis-1,3-Dichloropropene		100.0	79.8	129.9	2.9	30.0
Toluene		104.8	79.8	124.5	3.5	30.0
trans-1,3-Dichloropropene		99.7	74.0	131.3	3.5	30.0
1,1,2-Trichloroethane		103.2	78.7	123.1	2.9	30.0
Tetrachloroethene	*	103.4	74.5	124.5	42.0	30.0
trans-1,4-Dichloro-2-butene		84.6	68.6	135.4	1.9	30.0
Dibromochloromethane		95.3	74.6	127.2	1.5	30.0
1,2-Dibromoethane		99.8	70.3	133.7	1.8	30.0
Chlorobenzene		100.1	79.2	122.7	2.3	30.0

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		94.7	80.3	128.2	1.4	30.0
Ethylbenzene		102.6	79.5	129.1	2.2	30.0
p,m-Xylene		100.5	79.4	132.2	2.2	30.0
o-Xylene		100.4	80.2	131.0	1.1	30.0
Styrene		100.1	69.5	126.7	2.6	30.0
Isopropylbenzene		100.8	74.4	121.5	1.8	30.0
Bromoform		90.4	69.4	128.0	1.7	30.0
1,1,2,2-Tetrachloroethane		97.5	79.8	126.3	1.6	30.0
1,2,3-Trichloropropane		97.3	78.3	138.8	1.4	30.0
n-Propylbenzene		102.1	82.0	130.7	1.4	30.0
Bromobenzene		96.9	78.7	124.6	1.6	30.0
1,3,5-Trimethylbenzene		99.6	81.3	128.9	0.1	30.0
tert-Butylbenzene		98.5	80.7	128.9	0.4	30.0
1,2,4-Trimethylbenzene		97.7	81.4	130.8	0.9	30.0
sec-Butylbenzene		104.1	77.4	129.8	0.5	30.0
p-Isopropyltoluene		101.9	79.8	137.5	0.7	30.0
1,3-Dichlorobenzene		98.6	77.0	131.3	0.9	30.0
1,4-Dichlorobenzene		99.4	20.7	137.7	1.1	30.0
1,2-Dichlorobenzene		100.5	10.0	166.2	0.6	30.0
1,2,3-Trimethylbenzene		100.7	76.3	124.2	0.5	30.0
n-Butylbenzene		100.2	80.0	133.3	0.2	30.0
Hexachloroethane		90.7	23.8	138.1	0.8	30.0
1,2-Dibromo-3-chloropropane		94.0	21.2	189.4	0.2	30.0
1,2,4-Trichlorobenzene		96.7	27.4	143.4	0.5	30.0
1,2,3-Trichlorobenzene		97.5	75.4	131.4	1.1	30.0
Naphthalene		100.1	32.9	135.8	1.3	30.0
2-Methylnaphthalene		98.4	25.5	165.5	3.1	30.0

Organics - Volatiles, Prep Batch ID: VF200610W1

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

Blank (BLK)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		101.0	67.4	121.2
Acetone		98.8	29.9	161.5
Methyl iodide		101.4	68.8	116.4
Carbon disulfide		105.3	63.8	137.4
tert-Methyl butyl ether (MTBE)		105.1	73.2	122.4
Acrylonitrile		104.3	69.9	128.9
2-Butanone (MEK)		95.2	44.0	134.4
Dichlorodifluoromethane		109.2	10.0	222.8
Chloromethane		100.0	23.8	166.5
Vinyl chloride		102.4	43.5	149.1
Bromomethane		102.0	56.8	151.3
Chloroethane		101.9	53.4	149.4
Trichlorofluoromethane		97.8	59.7	151.8
1,1-Dichloroethene		104.6	69.6	139.4
Methylene chloride		93.5	73.3	121.1
trans-1,2-Dichloroethene		101.3	73.6	129.3
1,1-Dichloroethane		100.5	71.5	126.2
cis-1,2-Dichloroethene		98.7	76.6	122.1
Tetrahydrofuran		99.9	59.0	117.9
Chloroform		98.1	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		99.4	78.2	120.8
1,1,1-Trichloroethane		104.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.2	71.6	125.2
2-Hexanone		101.4	55.4	136.9
Carbon tetrachloride		98.7	72.6	133.0
Benzene		96.5	79.9	124.9
1,2-Dichloroethane		93.9	76.0	126.3
Trichloroethene		97.6	79.7	124.2
1,2-Dichloropropane		98.7	78.6	126.4
Bromodichloromethane		99.4	80.4	128.2
Dibromomethane		95.5	76.9	122.1
cis-1,3-Dichloropropene		104.0	79.8	129.9
Toluene		97.8	79.8	124.5
trans-1,3-Dichloropropene		105.2	74.0	131.3
1,1,2-Trichloroethane		97.1	78.7	123.1
Tetrachloroethene		93.8	74.5	124.5
trans-1,4-Dichloro-2-butene		106.7	68.6	135.4
Dibromochloromethane		99.3	74.6	127.2
1,2-Dibromoethane		96.5	70.3	133.7
Chlorobenzene		96.5	79.2	122.7
1,1,1,2-Tetrachloroethane		98.7	80.3	128.2
Ethylbenzene		100.7	79.5	129.1
p,m-Xylene		99.5	79.4	132.2
o-Xylene		100.0	80.2	131.0
Styrene		102.7	69.5	126.7
Isopropylbenzene		101.9	74.4	121.5
Bromoform		100.2	69.4	128.0
1,1,2,2-Tetrachloroethane		95.1	79.8	126.3
1,2,3-Trichloropropane		93.3	78.3	138.8
n-Propylbenzene		100.2	82.0	130.7
Bromobenzene		96.1	78.7	124.6
1,3,5-Trimethylbenzene		100.3	81.3	128.9
tert-Butylbenzene		100.6	80.7	128.9
1,2,4-Trimethylbenzene		101.8	81.4	130.8
sec-Butylbenzene		100.6	77.4	129.8
p-Isopropyltoluene		102.7	79.8	137.5
1,3-Dichlorobenzene		96.2	77.0	131.3
1,4-Dichlorobenzene		93.8	20.7	137.7
1,2-Dichlorobenzene		93.9	10.0	166.2
1,2,3-Trimethylbenzene		97.3	76.3	124.2
n-Butylbenzene		101.8	80.0	133.3
Hexachloroethane		98.9	23.8	138.1
1,2-Dibromo-3-chloropropane		100.2	21.2	189.4
1,2,4-Trichlorobenzene		101.3	27.4	143.4
1,2,3-Trichlorobenzene		99.5	75.4	131.4
Naphthalene		106.7	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		98.0	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		107.4	67.4	121.2	6.2	30.0
Acetone		104.7	29.9	161.5	5.8	30.0
Methyl iodide		106.7	68.8	116.4	5.1	30.0
Carbon disulfide		110.8	63.8	137.4	5.1	30.0
tert-Methyl butyl ether (MTBE)		110.6	73.2	122.4	5.1	30.0
Acrylonitrile		112.6	69.9	128.9	7.7	30.0
2-Butanone (MEK)		100.9	44.0	134.4	5.8	30.0
Dichlorodifluoromethane		111.0	10.0	222.8	1.7	30.0
Chloromethane		109.0	23.8	166.5	8.6	30.0
Vinyl chloride		107.3	43.5	149.1	4.6	30.0
Bromomethane		105.5	56.8	151.3	3.4	30.0
Chloroethane		106.0	53.4	149.4	4.0	30.0
Trichlorofluoromethane		101.6	59.7	151.8	3.8	30.0
1,1-Dichloroethene		103.8	69.6	139.4	0.7	30.0
Methylene chloride		99.2	73.3	121.1	6.0	30.0
trans-1,2-Dichloroethene		107.3	73.6	129.3	5.8	30.0
1,1-Dichloroethane		106.0	71.5	126.2	5.3	30.0
cis-1,2-Dichloroethene		105.2	76.6	122.1	6.3	30.0
Tetrahydrofuran		106.8	59.0	117.9	6.6	30.0
Chloroform		103.9	78.4	124.0	5.8	30.0
Bromochloromethane		105.5	78.2	120.8	6.0	30.0
1,1,1-Trichloroethane		108.5	79.4	130.9	4.2	30.0
4-Methyl-2-pentanone (MIBK)		103.8	71.6	125.2	5.5	30.0
2-Hexanone		103.9	55.4	136.9	2.5	30.0
Carbon tetrachloride		100.6	72.6	133.0	2.0	30.0
Benzene		99.0	79.9	124.9	2.5	30.0
1,2-Dichloroethane		96.6	76.0	126.3	2.8	30.0
Trichloroethene		99.5	79.7	124.2	1.8	30.0
1,2-Dichloropropane		102.9	78.6	126.4	4.1	30.0
Bromodichloromethane		102.3	80.4	128.2	2.9	30.0
Dibromomethane		99.2	76.9	122.1	3.8	30.0
cis-1,3-Dichloropropene		109.1	79.8	129.9	4.8	30.0
Toluene		99.9	79.8	124.5	2.1	30.0
trans-1,3-Dichloropropene		109.2	74.0	131.3	3.8	30.0
1,1,2-Trichloroethane		101.1	78.7	123.1	4.0	30.0
Tetrachloroethene		96.4	74.5	124.5	2.6	30.0
trans-1,4-Dichloro-2-butene		108.6	68.6	135.4	1.7	30.0
Dibromochloromethane		102.7	74.6	127.2	3.3	30.0
1,2-Dibromoethane		99.9	70.3	133.7	3.5	30.0
Chlorobenzene		99.1	79.2	122.7	2.6	30.0

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		100.9	80.3	128.2	2.2	30.0
Ethylbenzene		103.0	79.5	129.1	2.2	30.0
p,m-Xylene		101.3	79.4	132.2	1.8	30.0
o-Xylene		102.4	80.2	131.0	2.3	30.0
Styrene		105.2	69.5	126.7	2.5	30.0
Isopropylbenzene		104.3	74.4	121.5	2.3	30.0
Bromoform		102.7	69.4	128.0	2.5	30.0
1,1,2,2-Tetrachloroethane		99.1	79.8	126.3	4.1	30.0
1,2,3-Trichloropropane		96.1	78.3	138.8	3.0	30.0
n-Propylbenzene		102.8	82.0	130.7	2.6	30.0
Bromobenzene		97.9	78.7	124.6	1.9	30.0
1,3,5-Trimethylbenzene		102.8	81.3	128.9	2.5	30.0
tert-Butylbenzene		102.7	80.7	128.9	2.1	30.0
1,2,4-Trimethylbenzene		103.3	81.4	130.8	1.5	30.0
sec-Butylbenzene		106.6	77.4	129.8	5.8	30.0
p-Isopropyltoluene		108.2	79.8	137.5	5.2	30.0
1,3-Dichlorobenzene		100.4	77.0	131.3	4.3	30.0
1,4-Dichlorobenzene		99.0	20.7	137.7	5.5	30.0
1,2-Dichlorobenzene		100.1	10.0	166.2	6.4	30.0
1,2,3-Trimethylbenzene		102.4	76.3	124.2	5.1	30.0
n-Butylbenzene		107.0	80.0	133.3	5.0	30.0
Hexachloroethane		104.0	23.8	138.1	5.0	30.0
1,2-Dibromo-3-chloropropane		109.8	21.2	189.4	9.2	30.0
1,2,4-Trichlorobenzene		109.0	27.4	143.4	7.3	30.0
1,2,3-Trichlorobenzene		106.6	75.4	131.4	6.9	30.0
Naphthalene		115.0	32.9	135.8	7.4	30.0
2-Methylnaphthalene		106.4	25.5	165.5	8.2	30.0

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		96.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.8	70.0	130.0	16.2	30.0

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128282

CHAIN OF CUSTODY RECORD Plant 3

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-385-2494 FAX NO.: 248-994-2241 P.O. NO.:
E-MAIL ADDRESS: Michael.Spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700/RACER Lansing Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM5030C/8260C	1,4-Dioxane 8260B SIMS	Select Metals SM3471B	SVOCs SM8270B	Hexavalent Chromium
14651.01	6/8/20	1035	MW-02-04(3)_060820	GW	4		3	1						X	X		
.02	6/8/20	1215	MW-18-97_060820	GW	3		3							X			
.03	6/8/20	1340	MW-18-94_060820	GW	3		3							X			
.04	6/8/20	1555	CH-14-RD_060820	GW	2	1		1							X		X
.05	6/8/20	0950	UNK-11_060820	GW	5	2	3						X			X	
.06	6/8/20	1100	UNK-10_060820	GW	3		3						X				
.07	6/8/20	1215	P3-SB-28_060820	GW	2	2										X	
.08	6/8/20	1415	MW-05(3)_060820	GW	3		3						X				
.09	6/8/20	1545	MW-13-32_060820	GW	3	2		1							X	X	
.10	6/8/20	—	Trip Blank	GW	1		1						X				

* Select Metals: As, Ni, Pb, V, Cr, Cu

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Austin Westhuis / Arcadis ☒ Sampler	DATE 6/8/20	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	Daniel Stoddard Arcadis	DATE 6/8/20	TIME 17:10
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Daniel Stoddard	DATE 6/8/20	TIME 18:30
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 6/8/20	TIME 18:30

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 6/9/2020	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Ailsworth	DATE 6/9/2020	TIME 0915

SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS
SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS

NOTES. TEMP. ON ARRIVAL 2.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S14653-02
Generated on 07/07/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14653.01-S14653.07
Project: 30042872 RACER Lansing
Submitted Date/Time: 06/09/2020 08:15
Sampled by: Daniel Stockard
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-8)
Prep Batch Summary (Page 9)
Surrogates per Lab Sample (Pages 10-13)
Surrogates per QC Sample (Pages 14-17)
Batch QC Results (Pages 18-25)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S14653.01
Sample Tag: MW-16-85_060820
Collected Date/Time: 06/08/2020 09:55
Matrix: Groundwater
COC Reference: 124710

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 14:08	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 07:26	200609C7	VF200609W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14653.02

Sample Tag: MW-16-85_060820 MS

Collected Date/Time: 06/08/2020 09:55

Matrix: Groundwater

COC Reference: 124710

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 21:54	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 04:51	200609C7	VF200609W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14653.03

Sample Tag: MW-16-85_060820 MSD

Collected Date/Time: 06/08/2020 09:55

Matrix: Groundwater

COC Reference: 124710

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 22:16	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 05:11	200609C7	VF200609W3	Yes	BLK/LCS/LCSD

Lab Sample ID: S14653.04

Sample Tag: MW-16-75_060820

Collected Date/Time: 06/08/2020 14:30

Matrix: Groundwater

COC Reference: 124710

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/16/20 15:35	200616B9	VS200616W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14653.05

Sample Tag: MW-16-77_060820

Collected Date/Time: 06/08/2020 16:05

Matrix: Groundwater

COC Reference: 124710

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 06:04	200610B9	VS200610W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14653.06

Sample Tag: MW-16-76_060820

Collected Date/Time: 06/08/2020 17:40

Matrix: Groundwater

COC Reference: 124710

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 06:26	200610B9	VS200610W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14653.07

Sample Tag: Trip Blank_060820

Collected Date/Time: 06/08/2020 00:01

Matrix: Water

COC Reference: 124710

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 07:07	200609C7	VF200609W3	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF200609W3

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14653.01	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 07:26	200609C7
S14653.02	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 04:51	200609C7
S14653.03	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 05:11	200609C7
S14653.07	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 07:07	200609C7

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14653.05	1,4-Dioxane	SW8260B - SIM	06/11/20 06:04	200610B9
S14653.06	1,4-Dioxane	SW8260B - SIM	06/11/20 06:26	200610B9

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14653.01	1,4-Dioxane	SW8260B - SIM	06/12/20 14:08	200612A9
S14653.02	1,4-Dioxane	SW8260B - SIM	06/12/20 21:54	200612A9
S14653.03	1,4-Dioxane	SW8260B - SIM	06/12/20 22:16	200612A9

Organics - Volatiles, Prep Batch ID: VS200616W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14653.04	1,4-Dioxane	SW8260B - SIM	06/16/20 15:35	200616B9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14653.01

Sample Tag: MW-16-85_060820

Collected Date/Time: 06/08/2020 09:55

Matrix: Groundwater

COC Reference: 124710

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 14:08, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200609C7, Run Date: 06/10/2020 07:26, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.5**	80.0	124.0
1,2-Dichloroethane-D4		**98.8**	72.0	125.0
Toluene-D8		**101.2**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14653.05

Sample Tag: MW-16-77_060820

Collected Date/Time: 06/08/2020 16:05

Matrix: Groundwater

COC Reference: 124710

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/11/2020 06:04, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14653.06

Sample Tag: MW-16-76_060820

Collected Date/Time: 06/08/2020 17:40

Matrix: Groundwater

COC Reference: 124710

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/11/2020 06:26, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14653.07

Sample Tag: Trip Blank_060820

Collected Date/Time: 06/08/2020 00:01

Matrix: Water

COC Reference: 124710

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200609C7, Run Date: 06/10/2020 07:07, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.7**	80.0	124.0
1,2-Dichloroethane-D4		**99.9**	72.0	125.0
Toluene-D8		**100.1**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200609W3

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.2**	80.0	124.0
1,2-Dichloroethane-D4		**99.9**	72.0	125.0
Toluene-D8		**99.7**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**98.1**	72.0	125.0
Toluene-D8		**101.2**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.6**	80.0	124.0
1,2-Dichloroethane-D4		**98.5**	72.0	125.0
Toluene-D8		**100.4**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200610W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200612W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)	*	**50.0**	60.0	140.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200616W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200616B9.BLKW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 13:47, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:23, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200616B9.LCSDW16A, Parent Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:44, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VF200609W3

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

Blank (BLK)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200609C7.BLKW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 06:09, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		109.3	67.4	121.2
Acetone		109.2	29.9	161.5
Methyl iodide		107.8	68.8	116.4
Carbon disulfide		111.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		104.9	73.2	122.4
Acrylonitrile		105.2	69.9	128.9
2-Butanone (MEK)		96.7	44.0	134.4
Dichlorodifluoromethane		112.4	10.0	222.8
Chloromethane		110.6	23.8	166.5
Vinyl chloride		110.5	43.5	149.1
Bromomethane		100.5	56.8	151.3
Chloroethane		104.6	53.4	149.4
Trichlorofluoromethane		99.5	59.7	151.8
1,1-Dichloroethene		112.2	69.6	139.4
Methylene chloride		102.4	73.3	121.1
trans-1,2-Dichloroethene		110.8	73.6	129.3
1,1-Dichloroethane		111.0	71.5	126.2
cis-1,2-Dichloroethene		106.6	76.6	122.1
Tetrahydrofuran		102.9	59.0	117.9
Chloroform		107.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		105.5	78.2	120.8
1,1,1-Trichloroethane		106.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		101.0	71.6	125.2
2-Hexanone		103.7	55.4	136.9
Carbon tetrachloride		101.1	72.6	133.0
Benzene		108.6	79.9	124.9
1,2-Dichloroethane		99.9	76.0	126.3
Trichloroethene		108.1	79.7	124.2
1,2-Dichloropropane		108.2	78.6	126.4
Bromodichloromethane		103.3	80.4	128.2
Dibromomethane		100.9	76.9	122.1
cis-1,3-Dichloropropene		102.9	79.8	129.9
Toluene		108.5	79.8	124.5
trans-1,3-Dichloropropene		103.3	74.0	131.3
1,1,2-Trichloroethane		106.2	78.7	123.1
Tetrachloroethene	*	158.5	74.5	124.5
trans-1,4-Dichloro-2-butene		86.2	68.6	135.4
Dibromochloromethane		96.7	74.6	127.2
1,2-Dibromoethane		101.7	70.3	133.7
Chlorobenzene		102.5	79.2	122.7
1,1,1,2-Tetrachloroethane		96.0	80.3	128.2
Ethylbenzene		104.8	79.5	129.1
p,m-Xylene		102.7	79.4	132.2
o-Xylene		101.6	80.2	131.0
Styrene		102.7	69.5	126.7
Isopropylbenzene		102.7	74.4	121.5
Bromoform		92.0	69.4	128.0
1,1,2,2-Tetrachloroethane		96.0	79.8	126.3
1,2,3-Trichloropropane		98.7	78.3	138.8
n-Propylbenzene		103.5	82.0	130.7
Bromobenzene		98.5	78.7	124.6
1,3,5-Trimethylbenzene		99.7	81.3	128.9
tert-Butylbenzene		98.9	80.7	128.9
1,2,4-Trimethylbenzene		98.5	81.4	130.8
sec-Butylbenzene		103.6	77.4	129.8
p-Isopropyltoluene		102.7	79.8	137.5
1,3-Dichlorobenzene		99.5	77.0	131.3
1,4-Dichlorobenzene		100.5	20.7	137.7
1,2-Dichlorobenzene		101.0	10.0	166.2
1,2,3-Trimethylbenzene		100.2	76.3	124.2
n-Butylbenzene		100.1	80.0	133.3
Hexachloroethane		90.0	23.8	138.1
1,2-Dibromo-3-chloropropane		93.8	21.2	189.4
1,2,4-Trichlorobenzene		96.2	27.4	143.4
1,2,3-Trichlorobenzene		96.5	75.4	131.4
Naphthalene		98.8	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:13, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		95.5	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		106.4	67.4	121.2	2.7	30.0
Acetone		112.2	29.9	161.5	2.7	30.0
Methyl iodide		105.7	68.8	116.4	1.9	30.0
Carbon disulfide		108.1	63.8	137.4	3.3	30.0
tert-Methyl butyl ether (MTBE)		102.8	73.2	122.4	2.0	30.0
Acrylonitrile		103.6	69.9	128.9	1.5	30.0
2-Butanone (MEK)		96.6	44.0	134.4	0.1	30.0
Dichlorodifluoromethane		105.7	10.0	222.8	6.1	30.0
Chloromethane		106.9	23.8	166.5	3.3	30.0
Vinyl chloride		107.1	43.5	149.1	3.2	30.0
Bromomethane		97.5	56.8	151.3	3.0	30.0
Chloroethane		103.5	53.4	149.4	1.0	30.0
Trichlorofluoromethane		94.6	59.7	151.8	5.0	30.0
1,1-Dichloroethene		108.0	69.6	139.4	3.8	30.0
Methylene chloride		100.3	73.3	121.1	2.0	30.0
trans-1,2-Dichloroethene		107.1	73.6	129.3	3.3	30.0
1,1-Dichloroethane		107.7	71.5	126.2	2.9	30.0
cis-1,2-Dichloroethene		103.3	76.6	122.1	3.2	30.0
Tetrahydrofuran		104.4	59.0	117.9	1.4	30.0
Chloroform		104.6	78.4	124.0	2.4	30.0
Bromochloromethane		103.6	78.2	120.8	1.8	30.0
1,1,1-Trichloroethane		102.6	79.4	130.9	3.3	30.0
4-Methyl-2-pentanone (MIBK)		99.2	71.6	125.2	1.8	30.0
2-Hexanone		101.9	55.4	136.9	1.7	30.0
Carbon tetrachloride		97.3	72.6	133.0	3.9	30.0
Benzene		106.1	79.9	124.9	2.3	30.0
1,2-Dichloroethane		98.1	76.0	126.3	1.8	30.0
Trichloroethene		102.3	79.7	124.2	5.5	30.0
1,2-Dichloropropane		105.5	78.6	126.4	2.5	30.0
Bromodichloromethane		101.2	80.4	128.2	2.0	30.0
Dibromomethane		98.5	76.9	122.1	2.5	30.0
cis-1,3-Dichloropropene		100.0	79.8	129.9	2.9	30.0
Toluene		104.8	79.8	124.5	3.5	30.0
trans-1,3-Dichloropropene		99.7	74.0	131.3	3.5	30.0
1,1,2-Trichloroethane		103.2	78.7	123.1	2.9	30.0
Tetrachloroethene	*	103.4	74.5	124.5	42.0	30.0
trans-1,4-Dichloro-2-butene		84.6	68.6	135.4	1.9	30.0
Dibromochloromethane		95.3	74.6	127.2	1.5	30.0
1,2-Dibromoethane		99.8	70.3	133.7	1.8	30.0
Chlorobenzene		100.1	79.2	122.7	2.3	30.0

Organics - Volatiles, Prep Batch ID: VF200609W3 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200609C7.LCSDW09C, Parent Sample ID: 200609C7.LCSW09C

Run in Batch: 200609C7, Run Date: 06/10/2020 04:32, Prep Date: 06/09/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		94.7	80.3	128.2	1.4	30.0
Ethylbenzene		102.6	79.5	129.1	2.2	30.0
p,m-Xylene		100.5	79.4	132.2	2.2	30.0
o-Xylene		100.4	80.2	131.0	1.1	30.0
Styrene		100.1	69.5	126.7	2.6	30.0
Isopropylbenzene		100.8	74.4	121.5	1.8	30.0
Bromoform		90.4	69.4	128.0	1.7	30.0
1,1,2,2-Tetrachloroethane		97.5	79.8	126.3	1.6	30.0
1,2,3-Trichloropropane		97.3	78.3	138.8	1.4	30.0
n-Propylbenzene		102.1	82.0	130.7	1.4	30.0
Bromobenzene		96.9	78.7	124.6	1.6	30.0
1,3,5-Trimethylbenzene		99.6	81.3	128.9	0.1	30.0
tert-Butylbenzene		98.5	80.7	128.9	0.4	30.0
1,2,4-Trimethylbenzene		97.7	81.4	130.8	0.9	30.0
sec-Butylbenzene		104.1	77.4	129.8	0.5	30.0
p-Isopropyltoluene		101.9	79.8	137.5	0.7	30.0
1,3-Dichlorobenzene		98.6	77.0	131.3	0.9	30.0
1,4-Dichlorobenzene		99.4	20.7	137.7	1.1	30.0
1,2-Dichlorobenzene		100.5	10.0	166.2	0.6	30.0
1,2,3-Trimethylbenzene		100.7	76.3	124.2	0.5	30.0
n-Butylbenzene		100.2	80.0	133.3	0.2	30.0
Hexachloroethane		90.7	23.8	138.1	0.8	30.0
1,2-Dibromo-3-chloropropane		94.0	21.2	189.4	0.2	30.0
1,2,4-Trichlorobenzene		96.7	27.4	143.4	0.5	30.0
1,2,3-Trichlorobenzene		97.5	75.4	131.4	1.1	30.0
Naphthalene		100.1	32.9	135.8	1.3	30.0
2-Methylnaphthalene		98.4	25.5	165.5	3.1	30.0

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		96.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.8	70.0	130.0	16.2	30.0

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		94.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		105.0	70.0	130.0	10.7	30.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.4	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		111.3	70.0	130.0	7.2	30.0

Organics - Volatiles, Prep Batch ID: VS200616W1

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

Blank (BLK)

Lab Sample ID: 200616B9.BLKW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 13:47, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:23, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		101.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200616B9.LCSDW16A, Parent Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:44, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.9	70.0	130.0	6.6	30.0

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C.O.C. PAGE # 1 OF 1

124710

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spaci / Daniel Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO: FAX NO: P.O. NO:
E-MAIL ADDRESS: mike.spaci@arcadis-us.com daniel.stockard@arcadis-us.com QUOTE NO:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Daniel Stockard

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs 8260C/SM5030C	1,4-Dioxane 8260B SIM	Special Instructions
.01/.02/.03	6/8/20	9:55	MW-16-85_060820	GW	9	9							X	X	MS/MSD
14653.04	6/8/20	14:30	MW-16-75_060820	GW	3	3								X	
.05	6/8/20	16:05	MW-16-77_060820	GW	3	3								X	
.06	6/8/20	17:40	MW-16-76_060820	GW	3	3								X	
.07			Trip Blank DMS		1								X	X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Daniel Stockard Arcadis (Sampler)	DATE 6/8/20	TIME 18:30
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 6/8/20	TIME 18:30
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 6/9/2020	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Pilcat	DATE 6/9/2020	TIME 0815
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: TEMP. ON ARRIVAL 2.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Quality Control Report

Report ID: QC-S14702-01
Generated on 06/15/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14702.01-S14702.04
Project: 30042872 RACER Lansing
Submitted Date/Time: 06/10/2020 08:15
Sampled by: Unknown
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-5)
Prep Batch Summary (Page 6)
Surrogates per Lab Sample (Pages 7-10)
Surrogates per QC Sample (Pages 11-13)
Batch QC Results (Pages 14-16)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S14702.01
Sample Tag: MW-13-45_060920
Collected Date/Time: 06/09/2020 09:45
Matrix: Groundwater
COC Reference: 118476

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 06:48	200610B9	VS200610W2	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14702.02
Sample Tag: MW-16-79_060920
Collected Date/Time: 06/09/2020 12:25
Matrix: Groundwater
COC Reference: 118476

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 15:09	200611A9	VS200611W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14702.03
Sample Tag: MW-16-78_060920
Collected Date/Time: 06/09/2020 15:15
Matrix: Groundwater
COC Reference: 118476

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 15:32	200611A9	VS200611W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14702.04
Sample Tag: PW-14-01_060920
Collected Date/Time: 06/09/2020 16:20
Matrix: Groundwater
COC Reference: 118476

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 20:47	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14702.01	1,4-Dioxane	SW8260B - SIM	06/11/20 06:48	200610B9

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14702.02	1,4-Dioxane	SW8260B - SIM	06/11/20 15:09	200611A9
S14702.03	1,4-Dioxane	SW8260B - SIM	06/11/20 15:32	200611A9

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14702.04	1,4-Dioxane	SW8260B - SIM	06/12/20 20:47	200612A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14702.01

Sample Tag: MW-13-45_060920

Collected Date/Time: 06/09/2020 09:45

Matrix: Groundwater

COC Reference: 118476

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200610B9, Run Date: 06/11/2020 06:48, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14702.02

Sample Tag: MW-16-79_060920

Collected Date/Time: 06/09/2020 12:25

Matrix: Groundwater

COC Reference: 118476

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 15:09, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14702.03

Sample Tag: MW-16-78_060920

Collected Date/Time: 06/09/2020 15:15

Matrix: Groundwater

COC Reference: 118476

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 15:32, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14702.04

Sample Tag: PW-14-01_060920

Collected Date/Time: 06/09/2020 16:20

Matrix: Groundwater

COC Reference: 118476

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 20:47, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200610W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200611W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200612W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)	*	**50.0**	60.0	140.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200610W2

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

Blank (BLK)

Lab Sample ID: 200610B9.BLKS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 22:40, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		96.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610B9.LCSDS09B, Parent Sample ID: 200610B9.LCSS09B

Run in Batch: 200610B9, Run Date: 06/10/2020 21:56, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		81.8	70.0	130.0	16.2	30.0

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.4	70.0	130.0	10.8	30.0

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		94.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		105.0	70.0	130.0	10.7	30.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.4	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		111.3	70.0	130.0	7.2	30.0

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C.O.C. PAGE # 1 OF 1

118476

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Specil Daniel Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: FAX NO.: P.O. NO.:
E-MAIL ADDRESS: mike.specil@arcadis.com daniel.stockard@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☐ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872. RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME:
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED ☒ MSID ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B SIM	ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)
14702.01	6/9/20	9:45	MW-13-45_060920	GW	3		3						X	
.02	6/9/20	12:25	MW-16-79_060920	GW	3		3						X	
.03	6/9/20	15:15	MW-16-78_060920	GW	3		3						X	
.04	6/9/20	16:20	DW-14-01_060920	GW	3		3						X	

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Daniel Stockard (Sampler)	DATE 6/9/20	TIME 18:30
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 6/9/20	TIME 18:30
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 6/10/20	TIME 8:15
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	DATE 6/10/20	TIME 8:15

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.1

Quality Control Report

Report ID: QC-S14704-02
Generated on 07/07/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14704.01-S14704.05
Project: 30042872.04700 / RACER Lansing - Plant 3
Submitted Date/Time: 06/10/2020 08:15
Sampled by: Unknown
P.O. #: 30042872.04700

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-6)
Prep Batch Summary (Page 7)
Surrogates per Lab Sample (Pages 8-9)
Surrogates per QC Sample (Pages 10-12)
Batch QC Results (Pages 13-25)

Report Flag Descriptions

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

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

Barbara Ball

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S14704.01
Sample Tag: MW-91-2R_060920
Collected Date/Time: 06/09/2020 15:00
Matrix: Groundwater
COC Reference: 128283

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chromium VI	SM3500-Cr B	06/10/20 11:35	CHR200610-W1	CHR200610-W1	No	BLK/LCS/MS/MSD/DU
Metals						
Arsenic	E200.8	06/12/20 11:05	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/12/20 11:05	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Copper	E200.8	06/12/20 11:05	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Lead	E200.8	06/12/20 11:05	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/12/20 11:05	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/12/20 11:05	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 12:34	200611A9	VS200611W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14704.02
Sample Tag: MW-91-2R_060920 MS
Collected Date/Time: 06/09/2020 15:00
Matrix: Groundwater
COC Reference: 128283

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chromium VI	SM3500-Cr B	06/10/20 11:40	CHR200610-W1	CHR200610-W1	No	BLK/LCS/MS/MSD/DU
Metals						
Arsenic	E200.8	06/12/20 11:06	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/12/20 11:06	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Copper	E200.8	06/12/20 11:06	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Lead	E200.8	06/12/20 11:06	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/12/20 11:06	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/12/20 11:06	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 20:20	200611A9	VS200611W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14704.03
Sample Tag: MW-91-2R_060920 MSD
Collected Date/Time: 06/09/2020 15:00
Matrix: Groundwater
COC Reference: 128283

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chromium VI	SM3500-Cr B	06/10/20 11:45	CHR200610-W1	CHR200610-W1	No	BLK/LCS/MS/MSD/DU
Metals						
Arsenic	E200.8	06/12/20 11:07	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/12/20 11:07	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Copper	E200.8	06/12/20 11:07	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Lead	E200.8	06/12/20 11:07	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/12/20 11:07	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/12/20 11:07	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 20:41	200611A9	VS200611W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14704.04
Sample Tag: MW-18-88_060920
Collected Date/Time: 06/09/2020 15:30
Matrix: Groundwater
COC Reference: 128283

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chromium VI	SM3500-Cr B	06/10/20 11:50	CHR200610-W1	CHR200610-W1	No	BLK/LCS/MS/MSD/DU
Metals						
Arsenic	E200.8	06/12/20 11:03	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	06/12/20 11:03	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Copper	E200.8	06/12/20 11:03	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Lead	E200.8	06/12/20 11:03	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Nickel	E200.8	06/12/20 11:03	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Vanadium	E200.8	06/12/20 11:03	MT5-20-0612A	MTD-061220-1	No	BLK/LCS/MS/MSD
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/15/20 15:31	200615A3	VF200615W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14704.05

Sample Tag: Trip Blank_060920

Collected Date/Time: 06/09/2020 00:01

Matrix: Water

COC Reference: 128283

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 12:27	200610A3	VF200610W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: CHR200610-W1

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14704.01	Chromium VI	SM3500-Cr B	06/10/20 11:35	CHR200610-W1
S14704.02	Chromium VI	SM3500-Cr B	06/10/20 11:40	CHR200610-W1
S14704.03	Chromium VI	SM3500-Cr B	06/10/20 11:45	CHR200610-W1
S14704.04	Chromium VI	SM3500-Cr B	06/10/20 11:50	CHR200610-W1

Metals, Prep Batch ID: MTD-061220-1

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14704.01	Arsenic	E200.8	06/12/20 11:05	MT5-20-0612A
S14704.01	Chromium	E200.8	06/12/20 11:05	MT5-20-0612A
S14704.01	Copper	E200.8	06/12/20 11:05	MT5-20-0612A
S14704.01	Lead	E200.8	06/12/20 11:05	MT5-20-0612A
S14704.01	Nickel	E200.8	06/12/20 11:05	MT5-20-0612A
S14704.01	Vanadium	E200.8	06/12/20 11:05	MT5-20-0612A
S14704.02	Arsenic	E200.8	06/12/20 11:06	MT5-20-0612A
S14704.02	Chromium	E200.8	06/12/20 11:06	MT5-20-0612A
S14704.02	Copper	E200.8	06/12/20 11:06	MT5-20-0612A
S14704.02	Lead	E200.8	06/12/20 11:06	MT5-20-0612A
S14704.02	Nickel	E200.8	06/12/20 11:06	MT5-20-0612A
S14704.02	Vanadium	E200.8	06/12/20 11:06	MT5-20-0612A
S14704.03	Arsenic	E200.8	06/12/20 11:07	MT5-20-0612A
S14704.03	Chromium	E200.8	06/12/20 11:07	MT5-20-0612A
S14704.03	Copper	E200.8	06/12/20 11:07	MT5-20-0612A
S14704.03	Lead	E200.8	06/12/20 11:07	MT5-20-0612A
S14704.03	Nickel	E200.8	06/12/20 11:07	MT5-20-0612A
S14704.03	Vanadium	E200.8	06/12/20 11:07	MT5-20-0612A
S14704.04	Arsenic	E200.8	06/12/20 11:03	MT5-20-0612A
S14704.04	Chromium	E200.8	06/12/20 11:03	MT5-20-0612A
S14704.04	Copper	E200.8	06/12/20 11:03	MT5-20-0612A
S14704.04	Lead	E200.8	06/12/20 11:03	MT5-20-0612A
S14704.04	Nickel	E200.8	06/12/20 11:03	MT5-20-0612A
S14704.04	Vanadium	E200.8	06/12/20 11:03	MT5-20-0612A

Organics - Volatiles, Prep Batch ID: VF200610W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14704.05	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 12:27	200610A3

Organics - Volatiles, Prep Batch ID: VF200615W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14704.04	Volatile Organics - DEQ List	SW5030C/8260C	06/15/20 15:31	200615A3

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14704.01	1,4-Dioxane	SW8260B - SIM	06/11/20 12:34	200611A9
S14704.02	1,4-Dioxane	SW8260B - SIM	06/11/20 20:20	200611A9
S14704.03	1,4-Dioxane	SW8260B - SIM	06/11/20 20:41	200611A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14704.01

Sample Tag: MW-91-2R_060920

Collected Date/Time: 06/09/2020 15:00

Matrix: Groundwater

COC Reference: 128283

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 12:34, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14704.05

Sample Tag: Trip Blank_060920

Collected Date/Time: 06/09/2020 00:01

Matrix: Water

COC Reference: 128283

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200610A3, Run Date: 06/10/2020 12:27, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**90.0**	80.0	124.0
1,2-Dichloroethane-D4		**109.2**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200610W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**88.2**	80.0	124.0
1,2-Dichloroethane-D4		**105.6**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.6**	80.0	124.0
1,2-Dichloroethane-D4		**101.8**	72.0	125.0
Toluene-D8		**101.0**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**99.8**	80.0	124.0
1,2-Dichloroethane-D4		**104.8**	72.0	125.0
Toluene-D8		**100.6**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200615W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200615A3.BLKW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:57, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**92.6**	80.0	124.0
1,2-Dichloroethane-D4		**96.0**	72.0	125.0
Toluene-D8		**93.8**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 11:41, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**104.2**	80.0	124.0
1,2-Dichloroethane-D4		**85.0**	72.0	125.0
Toluene-D8		**98.6**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200615A3.LCSDW15A, Parent Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:00, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**105.6**	80.0	124.0
1,2-Dichloroethane-D4		**87.0**	72.0	125.0
Toluene-D8		**97.0**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200611W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Inorganics, Prep Batch ID: CHR200610-W1

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: CHR200610-W1.LRB1

Run in Batch: CHR200610-W1, Run Date: 06/10/2020 11:00, Prep Date: 06/10/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Chromium VI		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: CHR200610-W1.LCS1

Run in Batch: CHR200610-W1, Run Date: 06/10/2020 11:15, Prep Date: 06/10/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Chromium VI		105	90	110

Matrix Spike (MS)

Lab Sample ID: CHR200610-W1.MS1, Parent Sample ID: S14704.01

Run in Batch: CHR200610-W1, Run Date: 06/10/2020 11:40, Prep Date: 06/10/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Chromium VI	*	44	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: CHR200610-W1.MSD1, Parent Sample ID: CHR200610-W1.MS1

Run in Batch: CHR200610-W1, Run Date: 06/10/2020 11:45, Prep Date: 06/10/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Chromium VI	*	53	80	120	17	15

Duplicate (DUP)

Lab Sample ID: CHR200610-W1.DP1, Parent Sample ID: S14701.01

Run in Batch: CHR200610-W1, Run Date: 06/10/2020 11:25, Prep Date: 06/10/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Chromium VI		<1	15

Metals, Prep Batch ID: MTD-061220-1

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Blank (BLK)

Lab Sample ID: MT5-20-0612A.021.LRB

Run in Batch: MT5-20-0612A, Run Date: 06/12/2020 10:52, Prep Date: 06/12/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Arsenic		ND	0.0004	mg/L
Chromium		ND	0.001	mg/L
Copper		ND	0.001	mg/L
Lead		ND	0.0006	mg/L
Nickel		ND	0.001	mg/L
Vanadium		ND	0.001	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: MT5-20-0612A.020.LCS

Run in Batch: MT5-20-0612A, Run Date: 06/12/2020 10:51, Prep Date: 06/12/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Arsenic		105	85	115
Chromium		102	85	115
Copper		106	85	115
Lead		98	85	115
Nickel		105	85	115
Vanadium		103	85	115

Matrix Spike (MS)

Lab Sample ID: MT5-20-0612A.032.MS, Parent Sample ID: S14704.01

Run in Batch: MT5-20-0612A, Run Date: 06/12/2020 11:06, Prep Date: 06/12/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Arsenic		104	75	125
Chromium		104	75	125
Copper		101	75	125
Lead		94	75	125
Nickel		102	75	125
Vanadium		107	75	125

Matrix Spike Duplicate (MSD)

Lab Sample ID: MT5-20-0612A.033.MSD, Parent Sample ID: MT5-20-0612A.032.MS

Run in Batch: MT5-20-0612A, Run Date: 06/12/2020 11:07, Prep Date: 06/12/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Arsenic		104	75	125	0	20
Chromium		103	75	125	0	20
Copper		100	75	125	1	20
Lead		94	75	125	0	20
Nickel		99	75	125	3	20
Vanadium		104	75	125	3	20

Organics - Volatiles, Prep Batch ID: VF200610W1

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

Blank (BLK)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		101.0	67.4	121.2
Acetone		98.8	29.9	161.5
Methyl iodide		101.4	68.8	116.4
Carbon disulfide		105.3	63.8	137.4
tert-Methyl butyl ether (MTBE)		105.1	73.2	122.4
Acrylonitrile		104.3	69.9	128.9
2-Butanone (MEK)		95.2	44.0	134.4
Dichlorodifluoromethane		109.2	10.0	222.8
Chloromethane		100.0	23.8	166.5
Vinyl chloride		102.4	43.5	149.1
Bromomethane		102.0	56.8	151.3
Chloroethane		101.9	53.4	149.4
Trichlorofluoromethane		97.8	59.7	151.8
1,1-Dichloroethene		104.6	69.6	139.4
Methylene chloride		93.5	73.3	121.1
trans-1,2-Dichloroethene		101.3	73.6	129.3
1,1-Dichloroethane		100.5	71.5	126.2
cis-1,2-Dichloroethene		98.7	76.6	122.1
Tetrahydrofuran		99.9	59.0	117.9
Chloroform		98.1	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		99.4	78.2	120.8
1,1,1-Trichloroethane		104.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.2	71.6	125.2
2-Hexanone		101.4	55.4	136.9
Carbon tetrachloride		98.7	72.6	133.0
Benzene		96.5	79.9	124.9
1,2-Dichloroethane		93.9	76.0	126.3
Trichloroethene		97.6	79.7	124.2
1,2-Dichloropropane		98.7	78.6	126.4
Bromodichloromethane		99.4	80.4	128.2
Dibromomethane		95.5	76.9	122.1
cis-1,3-Dichloropropene		104.0	79.8	129.9
Toluene		97.8	79.8	124.5
trans-1,3-Dichloropropene		105.2	74.0	131.3
1,1,2-Trichloroethane		97.1	78.7	123.1
Tetrachloroethene		93.8	74.5	124.5
trans-1,4-Dichloro-2-butene		106.7	68.6	135.4
Dibromochloromethane		99.3	74.6	127.2
1,2-Dibromoethane		96.5	70.3	133.7
Chlorobenzene		96.5	79.2	122.7
1,1,1,2-Tetrachloroethane		98.7	80.3	128.2
Ethylbenzene		100.7	79.5	129.1
p,m-Xylene		99.5	79.4	132.2
o-Xylene		100.0	80.2	131.0
Styrene		102.7	69.5	126.7
Isopropylbenzene		101.9	74.4	121.5
Bromoform		100.2	69.4	128.0
1,1,2,2-Tetrachloroethane		95.1	79.8	126.3
1,2,3-Trichloropropane		93.3	78.3	138.8
n-Propylbenzene		100.2	82.0	130.7
Bromobenzene		96.1	78.7	124.6
1,3,5-Trimethylbenzene		100.3	81.3	128.9
tert-Butylbenzene		100.6	80.7	128.9
1,2,4-Trimethylbenzene		101.8	81.4	130.8
sec-Butylbenzene		100.6	77.4	129.8
p-Isopropyltoluene		102.7	79.8	137.5
1,3-Dichlorobenzene		96.2	77.0	131.3
1,4-Dichlorobenzene		93.8	20.7	137.7
1,2-Dichlorobenzene		93.9	10.0	166.2
1,2,3-Trimethylbenzene		97.3	76.3	124.2
n-Butylbenzene		101.8	80.0	133.3
Hexachloroethane		98.9	23.8	138.1
1,2-Dibromo-3-chloropropane		100.2	21.2	189.4
1,2,4-Trichlorobenzene		101.3	27.4	143.4
1,2,3-Trichlorobenzene		99.5	75.4	131.4
Naphthalene		106.7	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		98.0	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		107.4	67.4	121.2	6.2	30.0
Acetone		104.7	29.9	161.5	5.8	30.0
Methyl iodide		106.7	68.8	116.4	5.1	30.0
Carbon disulfide		110.8	63.8	137.4	5.1	30.0
tert-Methyl butyl ether (MTBE)		110.6	73.2	122.4	5.1	30.0
Acrylonitrile		112.6	69.9	128.9	7.7	30.0
2-Butanone (MEK)		100.9	44.0	134.4	5.8	30.0
Dichlorodifluoromethane		111.0	10.0	222.8	1.7	30.0
Chloromethane		109.0	23.8	166.5	8.6	30.0
Vinyl chloride		107.3	43.5	149.1	4.6	30.0
Bromomethane		105.5	56.8	151.3	3.4	30.0
Chloroethane		106.0	53.4	149.4	4.0	30.0
Trichlorofluoromethane		101.6	59.7	151.8	3.8	30.0
1,1-Dichloroethene		103.8	69.6	139.4	0.7	30.0
Methylene chloride		99.2	73.3	121.1	6.0	30.0
trans-1,2-Dichloroethene		107.3	73.6	129.3	5.8	30.0
1,1-Dichloroethane		106.0	71.5	126.2	5.3	30.0
cis-1,2-Dichloroethene		105.2	76.6	122.1	6.3	30.0
Tetrahydrofuran		106.8	59.0	117.9	6.6	30.0
Chloroform		103.9	78.4	124.0	5.8	30.0
Bromochloromethane		105.5	78.2	120.8	6.0	30.0
1,1,1-Trichloroethane		108.5	79.4	130.9	4.2	30.0
4-Methyl-2-pentanone (MIBK)		103.8	71.6	125.2	5.5	30.0
2-Hexanone		103.9	55.4	136.9	2.5	30.0
Carbon tetrachloride		100.6	72.6	133.0	2.0	30.0
Benzene		99.0	79.9	124.9	2.5	30.0
1,2-Dichloroethane		96.6	76.0	126.3	2.8	30.0
Trichloroethene		99.5	79.7	124.2	1.8	30.0
1,2-Dichloropropane		102.9	78.6	126.4	4.1	30.0
Bromodichloromethane		102.3	80.4	128.2	2.9	30.0
Dibromomethane		99.2	76.9	122.1	3.8	30.0
cis-1,3-Dichloropropene		109.1	79.8	129.9	4.8	30.0
Toluene		99.9	79.8	124.5	2.1	30.0
trans-1,3-Dichloropropene		109.2	74.0	131.3	3.8	30.0
1,1,2-Trichloroethane		101.1	78.7	123.1	4.0	30.0
Tetrachloroethene		96.4	74.5	124.5	2.6	30.0
trans-1,4-Dichloro-2-butene		108.6	68.6	135.4	1.7	30.0
Dibromochloromethane		102.7	74.6	127.2	3.3	30.0
1,2-Dibromoethane		99.9	70.3	133.7	3.5	30.0
Chlorobenzene		99.1	79.2	122.7	2.6	30.0

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		100.9	80.3	128.2	2.2	30.0
Ethylbenzene		103.0	79.5	129.1	2.2	30.0
p,m-Xylene		101.3	79.4	132.2	1.8	30.0
o-Xylene		102.4	80.2	131.0	2.3	30.0
Styrene		105.2	69.5	126.7	2.5	30.0
Isopropylbenzene		104.3	74.4	121.5	2.3	30.0
Bromoform		102.7	69.4	128.0	2.5	30.0
1,1,2,2-Tetrachloroethane		99.1	79.8	126.3	4.1	30.0
1,2,3-Trichloropropane		96.1	78.3	138.8	3.0	30.0
n-Propylbenzene		102.8	82.0	130.7	2.6	30.0
Bromobenzene		97.9	78.7	124.6	1.9	30.0
1,3,5-Trimethylbenzene		102.8	81.3	128.9	2.5	30.0
tert-Butylbenzene		102.7	80.7	128.9	2.1	30.0
1,2,4-Trimethylbenzene		103.3	81.4	130.8	1.5	30.0
sec-Butylbenzene		106.6	77.4	129.8	5.8	30.0
p-Isopropyltoluene		108.2	79.8	137.5	5.2	30.0
1,3-Dichlorobenzene		100.4	77.0	131.3	4.3	30.0
1,4-Dichlorobenzene		99.0	20.7	137.7	5.5	30.0
1,2-Dichlorobenzene		100.1	10.0	166.2	6.4	30.0
1,2,3-Trimethylbenzene		102.4	76.3	124.2	5.1	30.0
n-Butylbenzene		107.0	80.0	133.3	5.0	30.0
Hexachloroethane		104.0	23.8	138.1	5.0	30.0
1,2-Dibromo-3-chloropropane		109.8	21.2	189.4	9.2	30.0
1,2,4-Trichlorobenzene		109.0	27.4	143.4	7.3	30.0
1,2,3-Trichlorobenzene		106.6	75.4	131.4	6.9	30.0
Naphthalene		115.0	32.9	135.8	7.4	30.0
2-Methylnaphthalene		106.4	25.5	165.5	8.2	30.0

Organics - Volatiles, Prep Batch ID: VF200615W1

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

Blank (BLK)

Lab Sample ID: 200615A3.BLKW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:57, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200615W1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200615A3.BLKW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:57, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 11:41, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		87.5	67.4	121.2
Acetone		93.0	29.9	161.5
Methyl iodide		91.0	68.8	116.4
Carbon disulfide		93.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		97.7	73.2	122.4
Acrylonitrile		92.2	69.9	128.9
2-Butanone (MEK)		84.3	44.0	134.4
Dichlorodifluoromethane		154.5	10.0	222.8
Chloromethane		102.5	23.8	166.5
Vinyl chloride		98.7	43.5	149.1
Bromomethane		95.1	56.8	151.3
Chloroethane		91.3	53.4	149.4
Trichlorofluoromethane		91.6	59.7	151.8
1,1-Dichloroethene		89.9	69.6	139.4
Methylene chloride		81.8	73.3	121.1
trans-1,2-Dichloroethene		88.7	73.6	129.3
1,1-Dichloroethane		88.8	71.5	126.2
cis-1,2-Dichloroethene		89.0	76.6	122.1
Tetrahydrofuran		92.0	59.0	117.9
Chloroform		89.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200615W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 11:41, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		92.1	78.2	120.8
1,1,1-Trichloroethane		95.2	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.2	71.6	125.2
2-Hexanone		100.8	55.4	136.9
Carbon tetrachloride		101.6	72.6	133.0
Benzene		94.6	79.9	124.9
1,2-Dichloroethane		93.6	76.0	126.3
Trichloroethene		96.4	79.7	124.2
1,2-Dichloropropane		95.6	78.6	126.4
Bromodichloromethane		102.6	80.4	128.2
Dibromomethane		100.2	76.9	122.1
cis-1,3-Dichloropropene		106.5	79.8	129.9
Toluene		97.5	79.8	124.5
trans-1,3-Dichloropropene		108.7	74.0	131.3
1,1,2-Trichloroethane		98.3	78.7	123.1
Tetrachloroethene		97.0	74.5	124.5
trans-1,4-Dichloro-2-butene		108.9	68.6	135.4
Dibromochloromethane		112.0	74.6	127.2
1,2-Dibromoethane		103.0	70.3	133.7
Chlorobenzene		101.3	79.2	122.7
1,1,1,2-Tetrachloroethane		105.8	80.3	128.2
Ethylbenzene		104.8	79.5	129.1
p,m-Xylene		103.9	79.4	132.2
o-Xylene		103.0	80.2	131.0
Styrene		106.8	69.5	126.7
Isopropylbenzene		106.1	74.4	121.5
Bromoform		116.1	69.4	128.0
1,1,2,2-Tetrachloroethane		99.8	79.8	126.3
1,2,3-Trichloropropane		99.7	78.3	138.8
n-Propylbenzene		103.3	82.0	130.7
Bromobenzene		101.6	78.7	124.6
1,3,5-Trimethylbenzene		104.9	81.3	128.9
tert-Butylbenzene		103.8	80.7	128.9
1,2,4-Trimethylbenzene		105.8	81.4	130.8
sec-Butylbenzene		106.1	77.4	129.8
p-Isopropyltoluene		108.0	79.8	137.5
1,3-Dichlorobenzene		101.6	77.0	131.3
1,4-Dichlorobenzene		100.1	20.7	137.7
1,2-Dichlorobenzene		99.6	10.0	166.2
1,2,3-Trimethylbenzene		102.4	76.3	124.2
n-Butylbenzene		105.4	80.0	133.3
Hexachloroethane		117.5	23.8	138.1
1,2-Dibromo-3-chloropropane		106.8	21.2	189.4
1,2,4-Trichlorobenzene		105.2	27.4	143.4
1,2,3-Trichlorobenzene		99.7	75.4	131.4
Naphthalene		103.7	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200615W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 11:41, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		89.3	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200615A3.LCSDW15A, Parent Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:00, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		84.9	67.4	121.2	3.0	30.0
Acetone		87.7	29.9	161.5	5.8	30.0
Methyl iodide		87.0	68.8	116.4	4.5	30.0
Carbon disulfide		88.2	63.8	137.4	6.1	30.0
tert-Methyl butyl ether (MTBE)		93.6	73.2	122.4	4.3	30.0
Acrylonitrile		88.3	69.9	128.9	4.3	30.0
2-Butanone (MEK)		88.2	44.0	134.4	4.5	30.0
Dichlorodifluoromethane		139.8	10.0	222.8	10.0	30.0
Chloromethane		97.0	23.8	166.5	5.5	30.0
Vinyl chloride		93.6	43.5	149.1	5.4	30.0
Bromomethane		89.9	56.8	151.3	5.6	30.0
Chloroethane		86.8	53.4	149.4	5.1	30.0
Trichlorofluoromethane		84.8	59.7	151.8	7.8	30.0
1,1-Dichloroethene		83.8	69.6	139.4	7.1	30.0
Methylene chloride		79.0	73.3	121.1	3.5	30.0
trans-1,2-Dichloroethene		85.1	73.6	129.3	4.1	30.0
1,1-Dichloroethane		85.1	71.5	126.2	4.3	30.0
cis-1,2-Dichloroethene		84.8	76.6	122.1	4.8	30.0
Tetrahydrofuran		93.8	59.0	117.9	2.0	30.0
Chloroform		84.1	78.4	124.0	5.8	30.0
Bromochloromethane		86.1	78.2	120.8	6.7	30.0
1,1,1-Trichloroethane		87.9	79.4	130.9	7.9	30.0
4-Methyl-2-pentanone (MIBK)		93.7	71.6	125.2	4.6	30.0
2-Hexanone		97.0	55.4	136.9	3.8	30.0
Carbon tetrachloride		93.6	72.6	133.0	8.2	30.0
Benzene		88.2	79.9	124.9	6.9	30.0
1,2-Dichloroethane		86.3	76.0	126.3	8.1	30.0
Trichloroethene		89.8	79.7	124.2	7.1	30.0
1,2-Dichloropropane		88.9	78.6	126.4	7.2	30.0
Bromodichloromethane		93.7	80.4	128.2	9.0	30.0
Dibromomethane		92.0	76.9	122.1	8.5	30.0
cis-1,3-Dichloropropene		97.1	79.8	129.9	9.2	30.0
Toluene		89.4	79.8	124.5	8.6	30.0
trans-1,3-Dichloropropene		98.2	74.0	131.3	10.2	30.0
1,1,2-Trichloroethane		89.8	78.7	123.1	9.1	30.0
Tetrachloroethene		88.4	74.5	124.5	9.3	30.0
trans-1,4-Dichloro-2-butene		94.1	68.6	135.4	14.6	30.0
Dibromochloromethane		100.7	74.6	127.2	10.6	30.0
1,2-Dibromoethane		94.7	70.3	133.7	8.4	30.0
Chlorobenzene		93.1	79.2	122.7	8.4	30.0

Organics - Volatiles, Prep Batch ID: VF200615W1 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200615A3.LCSDW15A, Parent Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:00, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		96.0	80.3	128.2	9.7	30.0
Ethylbenzene		95.7	79.5	129.1	9.1	30.0
p,m-Xylene		95.1	79.4	132.2	8.8	30.0
o-Xylene		95.2	80.2	131.0	7.9	30.0
Styrene		98.1	69.5	126.7	8.6	30.0
Isopropylbenzene		96.9	74.4	121.5	9.0	30.0
Bromoform		103.9	69.4	128.0	11.1	30.0
1,1,2,2-Tetrachloroethane		91.9	79.8	126.3	8.2	30.0
1,2,3-Trichloropropane		91.1	78.3	138.8	9.1	30.0
n-Propylbenzene		94.9	82.0	130.7	8.6	30.0
Bromobenzene		92.8	78.7	124.6	9.1	30.0
1,3,5-Trimethylbenzene		95.9	81.3	128.9	9.0	30.0
tert-Butylbenzene		94.2	80.7	128.9	9.7	30.0
1,2,4-Trimethylbenzene		96.7	81.4	130.8	9.0	30.0
sec-Butylbenzene		93.3	77.4	129.8	12.9	30.0
p-Isopropyltoluene		95.2	79.8	137.5	12.6	30.0
1,3-Dichlorobenzene		90.4	77.0	131.3	11.7	30.0
1,4-Dichlorobenzene		88.3	20.7	137.7	12.5	30.0
1,2-Dichlorobenzene		88.5	10.0	166.2	11.8	30.0
1,2,3-Trimethylbenzene		91.0	76.3	124.2	11.8	30.0
n-Butylbenzene		94.1	80.0	133.3	11.3	30.0
Hexachloroethane		101.3	23.8	138.1	14.8	30.0
1,2-Dibromo-3-chloropropane		97.4	21.2	189.4	9.2	30.0
1,2,4-Trichlorobenzene		94.7	27.4	143.4	10.5	30.0
1,2,3-Trichlorobenzene		91.1	75.4	131.4	9.0	30.0
Naphthalene		95.5	32.9	135.8	8.2	30.0
2-Methylnaphthalene		90.2	25.5	165.5	0.9	30.0

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.4	70.0	130.0	10.8	30.0

Plant 3

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128283

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2240 FAX NO.: 248-994-2241 P.O. NO.: 30042872.04700
E-MAIL ADDRESS: Michael.Spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700/RACER Lansing - Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM5030C/8260C	1,4-Dioxane 8260B SIMS	Select Metals *	SVOCs SM8270B	Hexavalent Chromium	Special Instructions
14704.01/02/03	6/9/20	1500	MW-91-2R_060920 MS/MSD	GW	15	3	9	3						X	X		X	* Select Metals:
.04	6/9/20	1530	MW-18-88_060920	GW	5	1	3	1					X		X		X	As, Ni, Pb, V, Cr, Cu
.05	6/9/20	—	Trip Blank	GW	1		1						X					

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
Aml Wyf b/Arcadis (☒ Sampler)	6/9/20	17:00
RECEIVED BY: Daniel Stoppard	6/9/20	17:00
RELINQUISHED BY: Daniel Stoppard	6/9/20	18:30
RECEIVED BY: Merit Dropbox	6/9/20	18:30

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
Merit Dropbox	6/10/20	815
RECEIVED BY:	6/10/20	815

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL: 2.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S14705-02
Generated on 07/07/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14705.01-S14705.11
Project: 30042872.04700 / RACER Lansing - Plant 2
Submitted Date/Time: 06/10/2020 08:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872.04700

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-12)
Prep Batch Summary (Page 13)
Surrogates per Lab Sample (Pages 14-23)
Surrogates per QC Sample (Pages 24-29)
Batch QC Results (Pages 30-51)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S14705.01
Sample Tag: Trip Blank_060920
Collected Date/Time: 06/09/2020 00:01
Matrix: Water
COC Reference: 128281

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 12:27	200610A3	VF200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14705.02
Sample Tag: MW-14-62_060920
Collected Date/Time: 06/09/2020 10:00
Matrix: Groundwater
COC Reference: 128281

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 19:56	P200615	SF200612W01	Yes	BLK/LCS/LCSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 17:06	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 16:37	200610A3	VF200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14705.03
Sample Tag: MW-14-57_060920
Collected Date/Time: 06/09/2020 09:55
Matrix: Groundwater
COC Reference: 128281

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 17:28	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S14705.04
Sample Tag: MW-14-59_060920
Collected Date/Time: 06/09/2020 11:15
Matrix: Groundwater
COC Reference: 128281

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 20:26	P200615	SF200612W01	Yes	BLK/LCS/LCSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 16:37	200611A9	VS200611W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 16:56	200610A3	VF200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14705.05

Sample Tag: DUP-01_060920

Collected Date/Time: 06/09/2020 00:01

Matrix: Groundwater

COC Reference: 128281

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 20:57	P200615	SF200612W01	Yes	BLK/LCS/LCSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 17:00	200611A9	VS200611W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 17:15	200610A3	VF200610W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14705.06
Sample Tag: MW-14-54_060920
Collected Date/Time: 06/09/2020 11:35
Matrix: Groundwater
COC Reference: 128281

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/11/20 16:22	200611A3	VF200611W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14705.07

Sample Tag: MW-14-60_060920

Collected Date/Time: 06/09/2020 13:10

Matrix: Groundwater

COC Reference: 128281

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 21:27	P200615	SF200612W01	Yes	BLK/LCS/LCSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 17:50	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	06/15/20 15:50	200615A3	VF200615W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14705.08

Sample Tag: MW-14-55_060920

Collected Date/Time: 06/09/2020 13:25

Matrix: Groundwater

COC Reference: 128281

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 18:13	200610A3	VF200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14705.09

Sample Tag: MW-14-58_060920

Collected Date/Time: 06/09/2020 14:25

Matrix: Groundwater

COC Reference: 128281

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 17:22	200611A9	VS200611W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 18:33	200610A3	VF200610W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14705.10

Sample Tag: MW-13-43_060920

Collected Date/Time: 06/09/2020 15:40

Matrix: Groundwater

COC Reference: 128281

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 21:09	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S14705.11

Sample Tag: EB-05_060920

Collected Date/Time: 06/09/2020 00:01

Matrix: Water

COC Reference: 128281

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 12:47	200610A3	VF200610W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14705.02	Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 19:56	P200615
S14705.04	Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 20:26	P200615
S14705.05	Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 20:57	P200615
S14705.07	Semi-Volatile Organics - MDEQ	SW8270D	06/15/20 21:27	P200615

Organics - Volatiles, Prep Batch ID: VF200610W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14705.01	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 12:27	200610A3
S14705.02	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 16:37	200610A3
S14705.04	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 16:56	200610A3
S14705.05	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 17:15	200610A3
S14705.08	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 18:13	200610A3
S14705.09	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 18:33	200610A3
S14705.11	Volatile Organics - DEQ List	SW5030C/8260C	06/10/20 12:47	200610A3

Organics - Volatiles, Prep Batch ID: VF200611W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14705.06	Volatile Organics - DEQ List	SW5030C/8260C	06/11/20 16:22	200611A3

Organics - Volatiles, Prep Batch ID: VF200615W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14705.07	Volatile Organics - DEQ List	SW5030C/8260C	06/15/20 15:50	200615A3

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14705.04	1,4-Dioxane	SW8260B - SIM	06/11/20 16:37	200611A9
S14705.05	1,4-Dioxane	SW8260B - SIM	06/11/20 17:00	200611A9
S14705.09	1,4-Dioxane	SW8260B - SIM	06/11/20 17:22	200611A9

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14705.02	1,4-Dioxane	SW8260B - SIM	06/12/20 17:06	200612A9
S14705.03	1,4-Dioxane	SW8260B - SIM	06/12/20 17:28	200612A9
S14705.07	1,4-Dioxane	SW8260B - SIM	06/12/20 17:50	200612A9
S14705.10	1,4-Dioxane	SW8260B - SIM	06/12/20 21:09	200612A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14705.02

Sample Tag: MW-14-62_060920

Collected Date/Time: 06/09/2020 10:00

Matrix: Groundwater

COC Reference: 128281

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200615, Run Date: 06/15/2020 19:56, Matrix: WW, Dilution: 2

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**50.5**	10.0	110.0
Phenol-D5		**36.4**	10.0	110.0
Nitrobenzene-D5		**83.9**	10.0	114.0
2-Fluorobiphenyl		**91.4**	10.0	116.0
2,4,6-Tribromophenol		**89.1**	10.0	123.0
Terphenyl-D14		**88.8**	10.0	141.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 17:06, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)	*	**50.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200610A3, Run Date: 06/10/2020 16:37, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**95.2**	80.0	124.0
1,2-Dichloroethane-D4		**98.0**	72.0	125.0
Toluene-D8		**95.8**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14705.03

Sample Tag: MW-14-57_060920

Collected Date/Time: 06/09/2020 09:55

Matrix: Groundwater

COC Reference: 128281

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 17:28, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14705.04

Sample Tag: MW-14-59_060920

Collected Date/Time: 06/09/2020 11:15

Matrix: Groundwater

COC Reference: 128281

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200615, Run Date: 06/15/2020 20:26, Matrix: WW, Dilution: 2

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**55.8**	10.0	110.0
Phenol-D5		**41.4**	10.0	110.0
Nitrobenzene-D5		**87.5**	10.0	114.0
2-Fluorobiphenyl		**93.7**	10.0	116.0
2,4,6-Tribromophenol		**90.6**	10.0	123.0
Terphenyl-D14		**91.9**	10.0	141.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 16:37, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200610A3, Run Date: 06/10/2020 16:56, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**91.0**	80.0	124.0
1,2-Dichloroethane-D4		**100.8**	72.0	125.0
Toluene-D8		**93.4**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14705.05

Sample Tag: DUP-01_060920

Collected Date/Time: 06/09/2020 00:01

Matrix: Groundwater

COC Reference: 128281

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200615, Run Date: 06/15/2020 20:57, Matrix: WW, Dilution: 2

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**52.3**	10.0	110.0
Phenol-D5		**39.4**	10.0	110.0
Nitrobenzene-D5		**80.4**	10.0	114.0
2-Fluorobiphenyl		**85.1**	10.0	116.0
2,4,6-Tribromophenol		**79.9**	10.0	123.0
Terphenyl-D14		**77.9**	10.0	141.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 17:00, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200610A3, Run Date: 06/10/2020 17:15, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**91.4**	80.0	124.0
1,2-Dichloroethane-D4		**97.4**	72.0	125.0
Toluene-D8		**94.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14705.06

Sample Tag: MW-14-54_060920

Collected Date/Time: 06/09/2020 11:35

Matrix: Groundwater

COC Reference: 128281

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200611A3, Run Date: 06/11/2020 16:22, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**98.0**	80.0	124.0
1,2-Dichloroethane-D4		**89.0**	72.0	125.0
Toluene-D8		**95.8**	89.0	112.0

Lab Sample ID: S14705.07

Sample Tag: MW-14-60_060920

Collected Date/Time: 06/09/2020 13:10

Matrix: Groundwater

COC Reference: 128281

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200615, Run Date: 06/15/2020 21:27, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**51.7**	10.0	110.0
Phenol-D5		**38.4**	10.0	110.0
Nitrobenzene-D5		**84.5**	10.0	114.0
2-Fluorobiphenyl		**94.1**	10.0	116.0
2,4,6-Tribromophenol		**89.8**	10.0	123.0
Terphenyl-D14		**88.6**	10.0	141.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 17:50, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14705.08

Sample Tag: MW-14-55_060920

Collected Date/Time: 06/09/2020 13:25

Matrix: Groundwater

COC Reference: 128281

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200610A3, Run Date: 06/10/2020 18:13, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**91.6**	80.0	124.0
1,2-Dichloroethane-D4		**93.4**	72.0	125.0
Toluene-D8		**93.8**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14705.09

Sample Tag: MW-14-58_060920

Collected Date/Time: 06/09/2020 14:25

Matrix: Groundwater

COC Reference: 128281

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611A9, Run Date: 06/11/2020 17:22, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200610A3, Run Date: 06/10/2020 18:33, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**90.2**	80.0	124.0
1,2-Dichloroethane-D4		**93.8**	72.0	125.0
Toluene-D8		**93.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14705.10

Sample Tag: MW-13-43_060920

Collected Date/Time: 06/09/2020 15:40

Matrix: Groundwater

COC Reference: 128281

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 21:09, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14705.11

Sample Tag: EB-05_060920

Collected Date/Time: 06/09/2020 00:01

Matrix: Water

COC Reference: 128281

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200610A3, Run Date: 06/10/2020 12:47, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**86.8**	80.0	124.0
1,2-Dichloroethane-D4		**109.6**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: P200615.BLKW12A

Run in Batch: P200615, Run Date: 06/15/2020 13:52, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**50.3**	10.0	110.0
Phenol-D5		**35.7**	10.0	110.0
Nitrobenzene-D5		**87.9**	10.0	114.0
2-Fluorobiphenyl		**91.1**	10.0	116.0
2,4,6-Tribromophenol		**88.2**	10.0	123.0
Terphenyl-D14		**85.6**	10.0	141.0

Laboratory Control Sample (LCS)

Lab Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:22, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**54.0**	10.0	110.0
Phenol-D5		**38.5**	10.0	110.0
Nitrobenzene-D5		**94.8**	10.0	114.0
2-Fluorobiphenyl		**103.0**	10.0	116.0
2,4,6-Tribromophenol		**97.2**	10.0	123.0
Terphenyl-D14		**92.3**	10.0	141.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200615.LCSDW12A, Parent Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:53, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**54.4**	10.0	110.0
Phenol-D5		**38.9**	10.0	110.0
Nitrobenzene-D5		**94.6**	10.0	114.0
2-Fluorobiphenyl		**101.0**	10.0	116.0
2,4,6-Tribromophenol		**99.4**	10.0	123.0
Terphenyl-D14		**94.5**	10.0	141.0

Organics - Volatiles, Prep Batch ID: VF200610W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**88.2**	80.0	124.0
1,2-Dichloroethane-D4		**105.6**	72.0	125.0
Toluene-D8		**95.0**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.6**	80.0	124.0
1,2-Dichloroethane-D4		**101.8**	72.0	125.0
Toluene-D8		**101.0**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**99.8**	80.0	124.0
1,2-Dichloroethane-D4		**104.8**	72.0	125.0
Toluene-D8		**100.6**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200611W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611A3.BLKW11A

Run in Batch: 200611A3, Run Date: 06/11/2020 11:19, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**91.0**	80.0	124.0
1,2-Dichloroethane-D4		**93.4**	72.0	125.0
Toluene-D8		**91.2**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A3.LCSW11A

Run in Batch: 200611A3, Run Date: 06/11/2020 10:01, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**101.0**	80.0	124.0
1,2-Dichloroethane-D4		**93.8**	72.0	125.0
Toluene-D8		**99.6**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A3.LCSDW11A, Parent Sample ID: 200611A3.LCSW11A

Run in Batch: 200611A3, Run Date: 06/11/2020 10:20, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**101.0**	80.0	124.0
1,2-Dichloroethane-D4		**90.2**	72.0	125.0
Toluene-D8		**96.8**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200615W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200615A3.BLKW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:57, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**92.6**	80.0	124.0
1,2-Dichloroethane-D4		**96.0**	72.0	125.0
Toluene-D8		**93.8**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 11:41, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**104.2**	80.0	124.0
1,2-Dichloroethane-D4		**85.0**	72.0	125.0
Toluene-D8		**98.6**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200615A3.LCSDW15A, Parent Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:00, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**105.6**	80.0	124.0
1,2-Dichloroethane-D4		**87.0**	72.0	125.0
Toluene-D8		**97.0**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200611W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200612W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)	*	**50.0**	60.0	140.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01

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

Blank (BLK)

Lab Sample ID: P200615.BLKW12A

Run in Batch: P200615, Run Date: 06/15/2020 13:52, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acenaphthene		ND	0.00050	mg/l
Acenaphthylene		ND	0.00050	mg/l
Anthracene		ND	0.00050	mg/l
Benzo(a)anthracene		ND	0.00050	mg/l
Benzo(b)fluoranthene		ND	0.00050	mg/l
Benzo(k)fluoranthene		ND	0.00050	mg/l
Benzo(ghi)perylene		ND	0.00050	mg/l
Benzo(a)pyrene		ND	0.00050	mg/l
bis(2-Chloroethoxy)methane		ND	0.00050	mg/l
bis(2-Chloroethyl)ether		ND	0.00050	mg/l
bis(2-Chloroisopropyl)ether		ND	0.00050	mg/l
bis(2-Ethylhexyl)phthalate		ND	0.00050	mg/l
4-Bromophenyl phenyl ether		ND	0.00050	mg/l
Butyl benzyl phthalate		ND	0.00050	mg/l
4-Chloroaniline		ND	0.00050	mg/l
2-Chloronaphthalene		ND	0.00050	mg/l
4-Chloro-3-methylphenol		ND	0.00050	mg/l
2-Chlorophenol		ND	0.00050	mg/l
4-Chlorophenyl phenyl ether		ND	0.00050	mg/l
Chrysene		ND	0.00050	mg/l
3-, 4-Methylphenol (p,m-Cresol)		ND	0.00100	mg/l
2-Methylphenol (o-Cresol)		ND	0.00050	mg/l
Dibenzo(ah)anthracene		ND	0.00050	mg/l
Dibenzofuran		ND	0.00050	mg/l
di-n-Butyl phthalate	*	0.00059	0.00050	mg/l
1,2-Dichlorobenzene		ND	0.00050	mg/l
1,3-Dichlorobenzene		ND	0.00050	mg/l
1,4-Dichlorobenzene		ND	0.00050	mg/l
3,3'-Dichlorobenzidine		ND	0.00050	mg/l
2,4-Dichlorophenol		ND	0.00050	mg/l
Diethyl phthalate		ND	0.00050	mg/l
2,4-Dimethylphenol		ND	0.00050	mg/l
Dimethyl phthalate		ND	0.00050	mg/l
4,6-Dinitro-2-methylphenol		ND	0.00050	mg/l
2,4-Dinitrophenol		ND	0.00050	mg/l
2,4-Dinitrotoluene		ND	0.00050	mg/l
2,6-Dinitrotoluene		ND	0.00050	mg/l
1,2-Diphenylhydrazine		ND	0.00050	mg/l
di-n-Octyl phthalate		ND	0.00050	mg/l
Fluoranthene		ND	0.00050	mg/l
Fluorene		ND	0.00050	mg/l
Hexachlorobenzene		ND	0.00050	mg/l
Hexachlorobutadiene		ND	0.00050	mg/l
Hexachlorocyclopentadiene		ND	0.00050	mg/l
Hexachloroethane		ND	0.00050	mg/l
Indeno(1,2,3-cd)pyrene		ND	0.00050	mg/l

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: P200615.BLKW12A

Run in Batch: P200615, Run Date: 06/15/2020 13:52, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Isophorone		ND	0.00050	mg/l
2-Methylnaphthalene		ND	0.00050	mg/l
Naphthalene		ND	0.00050	mg/l
2-Nitroaniline		ND	0.00050	mg/l
3-Nitroaniline		ND	0.00050	mg/l
4-Nitroaniline		ND	0.00050	mg/l
Nitrobenzene		ND	0.00050	mg/l
2-Nitrophenol		ND	0.00050	mg/l
4-Nitrophenol		ND	0.00050	mg/l
N-Nitrosodiphenylamine		ND	0.00050	mg/l
N-Nitrosodi-n-propylamine		ND	0.00050	mg/l
Pentachlorophenol		ND	0.00050	mg/l
Phenanthrene		ND	0.00050	mg/l
Phenol		ND	0.00050	mg/l
Pyrene		ND	0.00050	mg/l
1,2,4-Trichlorobenzene		ND	0.00050	mg/l
2,4,5-Trichlorophenol		ND	0.00050	mg/l
2,4,6-Trichlorophenol		ND	0.00050	mg/l

Laboratory Control Sample (LCS)

Lab Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:22, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		87.7	37.82	102.82
Acenaphthylene		95.8	34.75	114.76
Anthracene		87.8	38.29	107.17
Benzo(a)anthracene		89.2	39.45	103.23
Benzo(b)fluoranthene		95.9	39.3	105.62
Benzo(k)fluoranthene		93.5	37.32	99.27
Benzo(ghi)perylene		92.2	25.65	121.02
Benzo(a)pyrene		95.9	41	102.98
bis(2-Chloroethoxy)methane		82.5	38.96	94.94
bis(2-Chloroethyl)ether		71.3	32.79	92.32
bis(2-Chloroisopropyl)ether		61.7	28.96	95.55
bis(2-Ethylhexyl)phthalate		77.7	43.38	102.89
4-Bromophenyl phenyl ether		87.3	36.32	111.95
Butyl benzyl phthalate		79.9	41.29	98.17
4-Chloroaniline		60.0	11.53	72.6
2-Chloronaphthalene		85.6	36.7	102.59
4-Chloro-3-methylphenol		82.6	39.63	104.28
2-Chlorophenol		77.6	34.18	94.55
4-Chlorophenyl phenyl ether		86.5	38.63	115.88
Chrysene		94.6	42.42	104.5
3-, 4-Methylphenol (p,m-Cresol)		59.2	36.4	115.4
2-Methylphenol (o-Cresol)		67.4	37.3	120.0
Dibenzo(ah)anthracene		82.6	31.37	119.17

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:22, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Dibenzofuran		90.9	40.25	104.89
di-n-Butyl phthalate		83.4	42.66	109.16
1,2-Dichlorobenzene		63.9	35.29	149.51
1,3-Dichlorobenzene		60.5	32.15	155.22
1,4-Dichlorobenzene		61.6	33.22	151.25
3,3'-Dichlorobenzidine		78.2	26.1	103.71
2,4-Dichlorophenol		86.0	41.58	98.03
Diethyl phthalate		83.1	43.35	109.88
2,4-Dimethylphenol		84.6	39.69	104.6
Dimethyl phthalate		88.5	44.99	102.98
4,6-Dinitro-2-methylphenol		77.9	19.98	101.32
2,4-Dinitrophenol		67.1	10	109.59
2,4-Dinitrotoluene		90.5	37.33	115.88
2,6-Dinitrotoluene		91.3	41.24	106.63
1,2-Diphenylhydrazine		83.9	39.95	95.79
di-n-Octyl phthalate		93.6	38.19	107.3
Fluoranthene		89.7	39.79	106.64
Fluorene		89.6	36.94	108.4
Hexachlorobenzene		89.3	34.37	118.98
Hexachlorobutadiene		61.2	16.99	122.89
Hexachlorocyclopentadiene		81.3	21.56	132.1
Hexachloroethane		52.3	22.96	157.68
Indeno(1,2,3-cd)pyrene		88.7	29.55	116.59
Isophorone		84.8	33.67	101.86
2-Methylnaphthalene		75.5	29.6	140.3
Naphthalene		76.1	31.37	140.54
2-Nitroaniline		94.1	41.37	98.69
3-Nitroaniline		73.0	22.05	86.36
4-Nitroaniline		89.5	31.15	107.83
Nitrobenzene		75.1	38.21	124.16
2-Nitrophenol		85.1	38.56	92.8
4-Nitrophenol		49.6	13.39	116.72
N-Nitrosodiphenylamine		92.5	33.26	108.23
N-Nitrosodi-n-propylamine		78.4	32.25	95.51
Pentachlorophenol		60.7	17.09	112.61
Phenanthrene		87.2	37.67	105.05
Phenol		35.1	10	103.25
Pyrene		98.8	38.69	102.69
1,2,4-Trichlorobenzene		70.0	39.12	156.7
2,4,5-Trichlorophenol		92.9	38.05	112.24
2,4,6-Trichlorophenol		88.8	38.38	108.99

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P200615.LCSDW12A, Parent Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:53, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		86.1	37.82	102.82	1.8	30.0
Acenaphthylene		94.7	34.75	114.76	1.1	30.0
Anthracene		88.1	38.29	107.17	0.4	30.0
Benzo(a)anthracene		91.7	39.45	103.23	2.8	30.0
Benzo(b)fluoranthene		94.6	39.3	105.62	1.4	30.0
Benzo(k)fluoranthene		94.6	37.32	99.27	1.2	30.0
Benzo(ghi)perylene		91.6	25.65	121.02	0.6	30.0
Benzo(a)pyrene		94.9	41	102.98	1.1	30.0
bis(2-Chloroethoxy)methane		81.9	38.96	94.94	0.8	30.0
bis(2-Chloroethyl)ether		73.4	32.79	92.32	2.8	30.0
bis(2-Chloroisopropyl)ether		62.0	28.96	95.55	0.4	30.0
bis(2-Ethylhexyl)phthalate		79.1	43.38	102.89	1.8	30.0
4-Bromophenyl phenyl ether		89.0	36.32	111.95	2.0	30.0
Butyl benzyl phthalate		82.0	41.29	98.17	2.5	30.0
4-Chloroaniline		60.0	11.53	72.6	0.1	30.0
2-Chloronaphthalene		84.5	36.7	102.59	1.3	30.0
4-Chloro-3-methylphenol		81.9	39.63	104.28	0.9	30.0
2-Chlorophenol		78.9	34.18	94.55	1.6	30.0
4-Chlorophenyl phenyl ether		84.8	38.63	115.88	2.0	30.0
Chrysene		93.6	42.42	104.5	1.1	30.0
3-, 4-Methylphenol (p,m-Cresol)		59.1	36.4	115.4	0.2	30.0
2-Methylphenol (o-Cresol)		68.5	37.3	120.0	1.6	30.0
Dibenzo(ah)anthracene		85.7	31.37	119.17	3.7	30.0
Dibenzofuran		87.5	40.25	104.89	3.8	30.0
di-n-Butyl phthalate		82.9	42.66	109.16	0.6	30.0
1,2-Dichlorobenzene		65.3	35.29	149.51	2.1	30.0
1,3-Dichlorobenzene		59.6	32.15	155.22	1.6	30.0
1,4-Dichlorobenzene		61.0	33.22	151.25	1.0	30.0
3,3'-Dichlorobenzidine		76.7	26.1	103.71	1.9	30.0
2,4-Dichlorophenol		82.9	41.58	98.03	3.6	30.0
Diethyl phthalate		83.8	43.35	109.88	0.9	30.0
2,4-Dimethylphenol		82.3	39.69	104.6	2.8	30.0
Dimethyl phthalate		88.1	44.99	102.98	0.4	30.0
4,6-Dinitro-2-methylphenol		79.1	19.98	101.32	1.6	30.0
2,4-Dinitrophenol		70.7	10	109.59	5.3	30.0
2,4-Dinitrotoluene		90.1	37.33	115.88	0.4	30.0
2,6-Dinitrotoluene		91.7	41.24	106.63	0.5	30.0
1,2-Diphenylhydrazine		84.9	39.95	95.79	1.2	30.0
di-n-Octyl phthalate		92.0	38.19	107.3	1.7	30.0
Fluoranthene		88.5	39.79	106.64	1.3	30.0
Fluorene		89.8	36.94	108.4	0.2	30.0
Hexachlorobenzene		92.5	34.37	118.98	3.5	30.0
Hexachlorobutadiene		59.4	16.99	122.89	3.0	30.0
Hexachlorocyclopentadiene		79.5	21.56	132.1	2.2	30.0
Hexachloroethane		52.6	22.96	157.68	0.5	30.0
Indeno(1,2,3-cd)pyrene		89.7	29.55	116.59	1.1	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF200612W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: P200615.LCSDW12A, Parent Sample ID: P200615.LCSW12A

Run in Batch: P200615, Run Date: 06/15/2020 14:53, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isophorone		84.2	33.67	101.86	0.7	30.0
2-Methylnaphthalene		75.4	29.6	140.3	0.2	30.0
Naphthalene		74.8	31.37	140.54	1.8	30.0
2-Nitroaniline		91.7	41.37	98.69	2.5	30.0
3-Nitroaniline		73.3	22.05	86.36	0.4	30.0
4-Nitroaniline		88.6	31.15	107.83	1.1	30.0
Nitrobenzene		74.1	38.21	124.16	1.4	30.0
2-Nitrophenol		85.0	38.56	92.8	0.2	30.0
4-Nitrophenol		49.9	13.39	116.72	0.7	30.0
N-Nitrosodiphenylamine		94.2	33.26	108.23	1.9	30.0
N-Nitrosodi-n-propylamine		79.5	32.25	95.51	1.5	30.0
Pentachlorophenol		63.6	17.09	112.61	4.6	30.0
Phenanthrene		89.5	37.67	105.05	2.5	30.0
Phenol		35.8	10	103.25	2.0	30.0
Pyrene		99.6	38.69	102.69	0.8	30.0
1,2,4-Trichlorobenzene		68.3	39.12	156.7	2.4	30.0
2,4,5-Trichlorophenol		95.7	38.05	112.24	2.9	30.0
2,4,6-Trichlorophenol		90.1	38.38	108.99	1.4	30.0

Organics - Volatiles, Prep Batch ID: VF200610W1

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

Blank (BLK)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200610A3.BLKW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 11:49, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		101.0	67.4	121.2
Acetone		98.8	29.9	161.5
Methyl iodide		101.4	68.8	116.4
Carbon disulfide		105.3	63.8	137.4
tert-Methyl butyl ether (MTBE)		105.1	73.2	122.4
Acrylonitrile		104.3	69.9	128.9
2-Butanone (MEK)		95.2	44.0	134.4
Dichlorodifluoromethane		109.2	10.0	222.8
Chloromethane		100.0	23.8	166.5
Vinyl chloride		102.4	43.5	149.1
Bromomethane		102.0	56.8	151.3
Chloroethane		101.9	53.4	149.4
Trichlorofluoromethane		97.8	59.7	151.8
1,1-Dichloroethene		104.6	69.6	139.4
Methylene chloride		93.5	73.3	121.1
trans-1,2-Dichloroethene		101.3	73.6	129.3
1,1-Dichloroethane		100.5	71.5	126.2
cis-1,2-Dichloroethene		98.7	76.6	122.1
Tetrahydrofuran		99.9	59.0	117.9
Chloroform		98.1	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		99.4	78.2	120.8
1,1,1-Trichloroethane		104.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.2	71.6	125.2
2-Hexanone		101.4	55.4	136.9
Carbon tetrachloride		98.7	72.6	133.0
Benzene		96.5	79.9	124.9
1,2-Dichloroethane		93.9	76.0	126.3
Trichloroethene		97.6	79.7	124.2
1,2-Dichloropropane		98.7	78.6	126.4
Bromodichloromethane		99.4	80.4	128.2
Dibromomethane		95.5	76.9	122.1
cis-1,3-Dichloropropene		104.0	79.8	129.9
Toluene		97.8	79.8	124.5
trans-1,3-Dichloropropene		105.2	74.0	131.3
1,1,2-Trichloroethane		97.1	78.7	123.1
Tetrachloroethene		93.8	74.5	124.5
trans-1,4-Dichloro-2-butene		106.7	68.6	135.4
Dibromochloromethane		99.3	74.6	127.2
1,2-Dibromoethane		96.5	70.3	133.7
Chlorobenzene		96.5	79.2	122.7
1,1,1,2-Tetrachloroethane		98.7	80.3	128.2
Ethylbenzene		100.7	79.5	129.1
p,m-Xylene		99.5	79.4	132.2
o-Xylene		100.0	80.2	131.0
Styrene		102.7	69.5	126.7
Isopropylbenzene		101.9	74.4	121.5
Bromoform		100.2	69.4	128.0
1,1,2,2-Tetrachloroethane		95.1	79.8	126.3
1,2,3-Trichloropropane		93.3	78.3	138.8
n-Propylbenzene		100.2	82.0	130.7
Bromobenzene		96.1	78.7	124.6
1,3,5-Trimethylbenzene		100.3	81.3	128.9
tert-Butylbenzene		100.6	80.7	128.9
1,2,4-Trimethylbenzene		101.8	81.4	130.8
sec-Butylbenzene		100.6	77.4	129.8
p-Isopropyltoluene		102.7	79.8	137.5
1,3-Dichlorobenzene		96.2	77.0	131.3
1,4-Dichlorobenzene		93.8	20.7	137.7
1,2-Dichlorobenzene		93.9	10.0	166.2
1,2,3-Trimethylbenzene		97.3	76.3	124.2
n-Butylbenzene		101.8	80.0	133.3
Hexachloroethane		98.9	23.8	138.1
1,2-Dibromo-3-chloropropane		100.2	21.2	189.4
1,2,4-Trichlorobenzene		101.3	27.4	143.4
1,2,3-Trichlorobenzene		99.5	75.4	131.4
Naphthalene		106.7	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:34, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		98.0	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		107.4	67.4	121.2	6.2	30.0
Acetone		104.7	29.9	161.5	5.8	30.0
Methyl iodide		106.7	68.8	116.4	5.1	30.0
Carbon disulfide		110.8	63.8	137.4	5.1	30.0
tert-Methyl butyl ether (MTBE)		110.6	73.2	122.4	5.1	30.0
Acrylonitrile		112.6	69.9	128.9	7.7	30.0
2-Butanone (MEK)		100.9	44.0	134.4	5.8	30.0
Dichlorodifluoromethane		111.0	10.0	222.8	1.7	30.0
Chloromethane		109.0	23.8	166.5	8.6	30.0
Vinyl chloride		107.3	43.5	149.1	4.6	30.0
Bromomethane		105.5	56.8	151.3	3.4	30.0
Chloroethane		106.0	53.4	149.4	4.0	30.0
Trichlorofluoromethane		101.6	59.7	151.8	3.8	30.0
1,1-Dichloroethene		103.8	69.6	139.4	0.7	30.0
Methylene chloride		99.2	73.3	121.1	6.0	30.0
trans-1,2-Dichloroethene		107.3	73.6	129.3	5.8	30.0
1,1-Dichloroethane		106.0	71.5	126.2	5.3	30.0
cis-1,2-Dichloroethene		105.2	76.6	122.1	6.3	30.0
Tetrahydrofuran		106.8	59.0	117.9	6.6	30.0
Chloroform		103.9	78.4	124.0	5.8	30.0
Bromochloromethane		105.5	78.2	120.8	6.0	30.0
1,1,1-Trichloroethane		108.5	79.4	130.9	4.2	30.0
4-Methyl-2-pentanone (MIBK)		103.8	71.6	125.2	5.5	30.0
2-Hexanone		103.9	55.4	136.9	2.5	30.0
Carbon tetrachloride		100.6	72.6	133.0	2.0	30.0
Benzene		99.0	79.9	124.9	2.5	30.0
1,2-Dichloroethane		96.6	76.0	126.3	2.8	30.0
Trichloroethene		99.5	79.7	124.2	1.8	30.0
1,2-Dichloropropane		102.9	78.6	126.4	4.1	30.0
Bromodichloromethane		102.3	80.4	128.2	2.9	30.0
Dibromomethane		99.2	76.9	122.1	3.8	30.0
cis-1,3-Dichloropropene		109.1	79.8	129.9	4.8	30.0
Toluene		99.9	79.8	124.5	2.1	30.0
trans-1,3-Dichloropropene		109.2	74.0	131.3	3.8	30.0
1,1,2-Trichloroethane		101.1	78.7	123.1	4.0	30.0
Tetrachloroethene		96.4	74.5	124.5	2.6	30.0
trans-1,4-Dichloro-2-butene		108.6	68.6	135.4	1.7	30.0
Dibromochloromethane		102.7	74.6	127.2	3.3	30.0
1,2-Dibromoethane		99.9	70.3	133.7	3.5	30.0
Chlorobenzene		99.1	79.2	122.7	2.6	30.0

Organics - Volatiles, Prep Batch ID: VF200610W1 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200610A3.LCSDW10A, Parent Sample ID: 200610A3.LCSW10A

Run in Batch: 200610A3, Run Date: 06/10/2020 10:52, Prep Date: 06/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		100.9	80.3	128.2	2.2	30.0
Ethylbenzene		103.0	79.5	129.1	2.2	30.0
p,m-Xylene		101.3	79.4	132.2	1.8	30.0
o-Xylene		102.4	80.2	131.0	2.3	30.0
Styrene		105.2	69.5	126.7	2.5	30.0
Isopropylbenzene		104.3	74.4	121.5	2.3	30.0
Bromoform		102.7	69.4	128.0	2.5	30.0
1,1,2,2-Tetrachloroethane		99.1	79.8	126.3	4.1	30.0
1,2,3-Trichloropropane		96.1	78.3	138.8	3.0	30.0
n-Propylbenzene		102.8	82.0	130.7	2.6	30.0
Bromobenzene		97.9	78.7	124.6	1.9	30.0
1,3,5-Trimethylbenzene		102.8	81.3	128.9	2.5	30.0
tert-Butylbenzene		102.7	80.7	128.9	2.1	30.0
1,2,4-Trimethylbenzene		103.3	81.4	130.8	1.5	30.0
sec-Butylbenzene		106.6	77.4	129.8	5.8	30.0
p-Isopropyltoluene		108.2	79.8	137.5	5.2	30.0
1,3-Dichlorobenzene		100.4	77.0	131.3	4.3	30.0
1,4-Dichlorobenzene		99.0	20.7	137.7	5.5	30.0
1,2-Dichlorobenzene		100.1	10.0	166.2	6.4	30.0
1,2,3-Trimethylbenzene		102.4	76.3	124.2	5.1	30.0
n-Butylbenzene		107.0	80.0	133.3	5.0	30.0
Hexachloroethane		104.0	23.8	138.1	5.0	30.0
1,2-Dibromo-3-chloropropane		109.8	21.2	189.4	9.2	30.0
1,2,4-Trichlorobenzene		109.0	27.4	143.4	7.3	30.0
1,2,3-Trichlorobenzene		106.6	75.4	131.4	6.9	30.0
Naphthalene		115.0	32.9	135.8	7.4	30.0
2-Methylnaphthalene		106.4	25.5	165.5	8.2	30.0

Organics - Volatiles, Prep Batch ID: VF200611W1

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

Blank (BLK)

Lab Sample ID: 200611A3.BLKW11A

Run in Batch: 200611A3, Run Date: 06/11/2020 11:19, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200611W1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200611A3.BLKW11A

Run in Batch: 200611A3, Run Date: 06/11/2020 11:19, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A3.LCSW11A

Run in Batch: 200611A3, Run Date: 06/11/2020 10:01, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		93.0	67.4	121.2
Acetone		95.0	29.9	161.5
Methyl iodide		93.6	68.8	116.4
Carbon disulfide		97.4	63.8	137.4
tert-Methyl butyl ether (MTBE)		100.2	73.2	122.4
Acrylonitrile		100.1	69.9	128.9
2-Butanone (MEK)		90.6	44.0	134.4
Dichlorodifluoromethane		92.3	10.0	222.8
Chloromethane		94.0	23.8	166.5
Vinyl chloride		91.5	43.5	149.1
Bromomethane		90.9	56.8	151.3
Chloroethane		91.4	53.4	149.4
Trichlorofluoromethane		87.9	59.7	151.8
1,1-Dichloroethene		94.5	69.6	139.4
Methylene chloride		86.8	73.3	121.1
trans-1,2-Dichloroethene		93.5	73.6	129.3
1,1-Dichloroethane		92.6	71.5	126.2
cis-1,2-Dichloroethene		92.2	76.6	122.1
Tetrahydrofuran		105.0	59.0	117.9
Chloroform		90.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200611W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200611A3.LCSW11A

Run in Batch: 200611A3, Run Date: 06/11/2020 10:01, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		92.8	78.2	120.8
1,1,1-Trichloroethane		94.3	79.4	130.9
4-Methyl-2-pentanone (MIBK)		104.0	71.6	125.2
2-Hexanone		107.0	55.4	136.9
Carbon tetrachloride		96.3	72.6	133.0
Benzene		95.5	79.9	124.9
1,2-Dichloroethane		92.7	76.0	126.3
Trichloroethene		95.6	79.7	124.2
1,2-Dichloropropane		97.8	78.6	126.4
Bromodichloromethane		98.4	80.4	128.2
Dibromomethane		95.5	76.9	122.1
cis-1,3-Dichloropropene		104.2	79.8	129.9
Toluene		95.9	79.8	124.5
trans-1,3-Dichloropropene		104.6	74.0	131.3
1,1,2-Trichloroethane		97.1	78.7	123.1
Tetrachloroethene		93.1	74.5	124.5
trans-1,4-Dichloro-2-butene		83.4	68.6	135.4
Dibromochloromethane		100.5	74.6	127.2
1,2-Dibromoethane		97.3	70.3	133.7
Chlorobenzene		95.5	79.2	122.7
1,1,1,2-Tetrachloroethane		97.3	80.3	128.2
Ethylbenzene		99.3	79.5	129.1
p,m-Xylene		98.1	79.4	132.2
o-Xylene		98.8	80.2	131.0
Styrene		101.4	69.5	126.7
Isopropylbenzene		101.3	74.4	121.5
Bromoform		102.2	69.4	128.0
1,1,2,2-Tetrachloroethane		96.1	79.8	126.3
1,2,3-Trichloropropane		93.8	78.3	138.8
n-Propylbenzene		98.9	82.0	130.7
Bromobenzene		94.0	78.7	124.6
1,3,5-Trimethylbenzene		99.7	81.3	128.9
tert-Butylbenzene		98.6	80.7	128.9
1,2,4-Trimethylbenzene		99.9	81.4	130.8
sec-Butylbenzene		102.7	77.4	129.8
p-Isopropyltoluene		104.3	79.8	137.5
1,3-Dichlorobenzene		97.2	77.0	131.3
1,4-Dichlorobenzene		94.5	20.7	137.7
1,2-Dichlorobenzene		94.9	10.0	166.2
1,2,3-Trimethylbenzene		99.0	76.3	124.2
n-Butylbenzene		103.4	80.0	133.3
Hexachloroethane		101.3	23.8	138.1
1,2-Dibromo-3-chloropropane		104.7	21.2	189.4
1,2,4-Trichlorobenzene		103.4	27.4	143.4
1,2,3-Trichlorobenzene		99.5	75.4	131.4
Naphthalene		107.7	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200611W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200611A3.LCSW11A

Run in Batch: 200611A3, Run Date: 06/11/2020 10:01, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		94.9	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A3.LCSDW11A, Parent Sample ID: 200611A3.LCSW11A

Run in Batch: 200611A3, Run Date: 06/11/2020 10:20, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		92.4	67.4	121.2	0.6	30.0
Acetone		94.7	29.9	161.5	0.3	30.0
Methyl iodide		93.3	68.8	116.4	0.3	30.0
Carbon disulfide		96.9	63.8	137.4	0.6	30.0
tert-Methyl butyl ether (MTBE)		99.8	73.2	122.4	0.4	30.0
Acrylonitrile		100.8	69.9	128.9	0.7	30.0
2-Butanone (MEK)		91.3	44.0	134.4	0.7	30.0
Dichlorodifluoromethane		88.9	10.0	222.8	3.8	30.0
Chloromethane		93.4	23.8	166.5	0.7	30.0
Vinyl chloride		91.3	43.5	149.1	0.2	30.0
Bromomethane		90.0	56.8	151.3	1.1	30.0
Chloroethane		90.2	53.4	149.4	1.3	30.0
Trichlorofluoromethane		85.9	59.7	151.8	2.4	30.0
1,1-Dichloroethene		96.2	69.6	139.4	1.8	30.0
Methylene chloride		86.1	73.3	121.1	0.8	30.0
trans-1,2-Dichloroethene		94.9	73.6	129.3	1.5	30.0
1,1-Dichloroethane		93.8	71.5	126.2	1.4	30.0
cis-1,2-Dichloroethene		92.8	76.6	122.1	0.7	30.0
Tetrahydrofuran		100.7	59.0	117.9	4.2	30.0
Chloroform		90.8	78.4	124.0	0.7	30.0
Bromochloromethane		92.0	78.2	120.8	0.9	30.0
1,1,1-Trichloroethane		93.2	79.4	130.9	1.2	30.0
4-Methyl-2-pentanone (MIBK)		99.3	71.6	125.2	4.6	30.0
2-Hexanone		101.3	55.4	136.9	5.5	30.0
Carbon tetrachloride		92.6	72.6	133.0	3.9	30.0
Benzene		93.3	79.9	124.9	2.3	30.0
1,2-Dichloroethane		88.9	76.0	126.3	4.2	30.0
Trichloroethene		94.3	79.7	124.2	1.4	30.0
1,2-Dichloropropane		95.6	78.6	126.4	2.3	30.0
Bromodichloromethane		95.4	80.4	128.2	3.1	30.0
Dibromomethane		92.4	76.9	122.1	3.3	30.0
cis-1,3-Dichloropropene		101.6	79.8	129.9	2.5	30.0
Toluene		93.7	79.8	124.5	2.3	30.0
trans-1,3-Dichloropropene		101.1	74.0	131.3	3.4	30.0
1,1,2-Trichloroethane		94.3	78.7	123.1	2.9	30.0
Tetrachloroethene		90.0	74.5	124.5	3.5	30.0
trans-1,4-Dichloro-2-butene		84.4	68.6	135.4	1.2	30.0
Dibromochloromethane		100.7	74.6	127.2	0.2	30.0
1,2-Dibromoethane		98.7	70.3	133.7	1.4	30.0
Chlorobenzene		96.4	79.2	122.7	1.0	30.0

Organics - Volatiles, Prep Batch ID: VF200611W1 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200611A3.LCSDW11A, Parent Sample ID: 200611A3.LCSW11A

Run in Batch: 200611A3, Run Date: 06/11/2020 10:20, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		97.1	80.3	128.2	0.2	30.0
Ethylbenzene		100.1	79.5	129.1	0.8	30.0
p,m-Xylene		98.7	79.4	132.2	0.7	30.0
o-Xylene		99.1	80.2	131.0	0.3	30.0
Styrene		101.9	69.5	126.7	0.5	30.0
Isopropylbenzene		101.0	74.4	121.5	0.2	30.0
Bromoform		101.0	69.4	128.0	1.2	30.0
1,1,2,2-Tetrachloroethane		96.1	79.8	126.3	0.0	30.0
1,2,3-Trichloropropane		93.0	78.3	138.8	0.9	30.0
n-Propylbenzene		98.9	82.0	130.7	0.1	30.0
Bromobenzene		95.0	78.7	124.6	1.1	30.0
1,3,5-Trimethylbenzene		98.5	81.3	128.9	1.2	30.0
tert-Butylbenzene		98.6	80.7	128.9	0.0	30.0
1,2,4-Trimethylbenzene		99.8	81.4	130.8	0.1	30.0
sec-Butylbenzene		101.4	77.4	129.8	1.3	30.0
p-Isopropyltoluene		103.6	79.8	137.5	0.7	30.0
1,3-Dichlorobenzene		97.6	77.0	131.3	0.5	30.0
1,4-Dichlorobenzene		95.3	20.7	137.7	0.8	30.0
1,2-Dichlorobenzene		95.5	10.0	166.2	0.7	30.0
1,2,3-Trimethylbenzene		98.0	76.3	124.2	1.0	30.0
n-Butylbenzene		102.8	80.0	133.3	0.6	30.0
Hexachloroethane		100.3	23.8	138.1	1.0	30.0
1,2-Dibromo-3-chloropropane		104.7	21.2	189.4	0.1	30.0
1,2,4-Trichlorobenzene		101.3	27.4	143.4	2.0	30.0
1,2,3-Trichlorobenzene		98.0	75.4	131.4	1.5	30.0
Naphthalene		105.8	32.9	135.8	1.8	30.0
2-Methylnaphthalene		98.5	25.5	165.5	3.7	30.0

Organics - Volatiles, Prep Batch ID: VF200615W1

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

Blank (BLK)

Lab Sample ID: 200615A3.BLKW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:57, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200615W1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200615A3.BLKW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:57, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 11:41, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		87.5	67.4	121.2
Acetone		93.0	29.9	161.5
Methyl iodide		91.0	68.8	116.4
Carbon disulfide		93.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		97.7	73.2	122.4
Acrylonitrile		92.2	69.9	128.9
2-Butanone (MEK)		84.3	44.0	134.4
Dichlorodifluoromethane		154.5	10.0	222.8
Chloromethane		102.5	23.8	166.5
Vinyl chloride		98.7	43.5	149.1
Bromomethane		95.1	56.8	151.3
Chloroethane		91.3	53.4	149.4
Trichlorofluoromethane		91.6	59.7	151.8
1,1-Dichloroethene		89.9	69.6	139.4
Methylene chloride		81.8	73.3	121.1
trans-1,2-Dichloroethene		88.7	73.6	129.3
1,1-Dichloroethane		88.8	71.5	126.2
cis-1,2-Dichloroethene		89.0	76.6	122.1
Tetrahydrofuran		92.0	59.0	117.9
Chloroform		89.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200615W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 11:41, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		92.1	78.2	120.8
1,1,1-Trichloroethane		95.2	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.2	71.6	125.2
2-Hexanone		100.8	55.4	136.9
Carbon tetrachloride		101.6	72.6	133.0
Benzene		94.6	79.9	124.9
1,2-Dichloroethane		93.6	76.0	126.3
Trichloroethene		96.4	79.7	124.2
1,2-Dichloropropane		95.6	78.6	126.4
Bromodichloromethane		102.6	80.4	128.2
Dibromomethane		100.2	76.9	122.1
cis-1,3-Dichloropropene		106.5	79.8	129.9
Toluene		97.5	79.8	124.5
trans-1,3-Dichloropropene		108.7	74.0	131.3
1,1,2-Trichloroethane		98.3	78.7	123.1
Tetrachloroethene		97.0	74.5	124.5
trans-1,4-Dichloro-2-butene		108.9	68.6	135.4
Dibromochloromethane		112.0	74.6	127.2
1,2-Dibromoethane		103.0	70.3	133.7
Chlorobenzene		101.3	79.2	122.7
1,1,1,2-Tetrachloroethane		105.8	80.3	128.2
Ethylbenzene		104.8	79.5	129.1
p,m-Xylene		103.9	79.4	132.2
o-Xylene		103.0	80.2	131.0
Styrene		106.8	69.5	126.7
Isopropylbenzene		106.1	74.4	121.5
Bromoform		116.1	69.4	128.0
1,1,2,2-Tetrachloroethane		99.8	79.8	126.3
1,2,3-Trichloropropane		99.7	78.3	138.8
n-Propylbenzene		103.3	82.0	130.7
Bromobenzene		101.6	78.7	124.6
1,3,5-Trimethylbenzene		104.9	81.3	128.9
tert-Butylbenzene		103.8	80.7	128.9
1,2,4-Trimethylbenzene		105.8	81.4	130.8
sec-Butylbenzene		106.1	77.4	129.8
p-Isopropyltoluene		108.0	79.8	137.5
1,3-Dichlorobenzene		101.6	77.0	131.3
1,4-Dichlorobenzene		100.1	20.7	137.7
1,2-Dichlorobenzene		99.6	10.0	166.2
1,2,3-Trimethylbenzene		102.4	76.3	124.2
n-Butylbenzene		105.4	80.0	133.3
Hexachloroethane		117.5	23.8	138.1
1,2-Dibromo-3-chloropropane		106.8	21.2	189.4
1,2,4-Trichlorobenzene		105.2	27.4	143.4
1,2,3-Trichlorobenzene		99.7	75.4	131.4
Naphthalene		103.7	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200615W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 11:41, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		89.3	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200615A3.LCSDW15A, Parent Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:00, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		84.9	67.4	121.2	3.0	30.0
Acetone		87.7	29.9	161.5	5.8	30.0
Methyl iodide		87.0	68.8	116.4	4.5	30.0
Carbon disulfide		88.2	63.8	137.4	6.1	30.0
tert-Methyl butyl ether (MTBE)		93.6	73.2	122.4	4.3	30.0
Acrylonitrile		88.3	69.9	128.9	4.3	30.0
2-Butanone (MEK)		88.2	44.0	134.4	4.5	30.0
Dichlorodifluoromethane		139.8	10.0	222.8	10.0	30.0
Chloromethane		97.0	23.8	166.5	5.5	30.0
Vinyl chloride		93.6	43.5	149.1	5.4	30.0
Bromomethane		89.9	56.8	151.3	5.6	30.0
Chloroethane		86.8	53.4	149.4	5.1	30.0
Trichlorofluoromethane		84.8	59.7	151.8	7.8	30.0
1,1-Dichloroethene		83.8	69.6	139.4	7.1	30.0
Methylene chloride		79.0	73.3	121.1	3.5	30.0
trans-1,2-Dichloroethene		85.1	73.6	129.3	4.1	30.0
1,1-Dichloroethane		85.1	71.5	126.2	4.3	30.0
cis-1,2-Dichloroethene		84.8	76.6	122.1	4.8	30.0
Tetrahydrofuran		93.8	59.0	117.9	2.0	30.0
Chloroform		84.1	78.4	124.0	5.8	30.0
Bromochloromethane		86.1	78.2	120.8	6.7	30.0
1,1,1-Trichloroethane		87.9	79.4	130.9	7.9	30.0
4-Methyl-2-pentanone (MIBK)		93.7	71.6	125.2	4.6	30.0
2-Hexanone		97.0	55.4	136.9	3.8	30.0
Carbon tetrachloride		93.6	72.6	133.0	8.2	30.0
Benzene		88.2	79.9	124.9	6.9	30.0
1,2-Dichloroethane		86.3	76.0	126.3	8.1	30.0
Trichloroethene		89.8	79.7	124.2	7.1	30.0
1,2-Dichloropropane		88.9	78.6	126.4	7.2	30.0
Bromodichloromethane		93.7	80.4	128.2	9.0	30.0
Dibromomethane		92.0	76.9	122.1	8.5	30.0
cis-1,3-Dichloropropene		97.1	79.8	129.9	9.2	30.0
Toluene		89.4	79.8	124.5	8.6	30.0
trans-1,3-Dichloropropene		98.2	74.0	131.3	10.2	30.0
1,1,2-Trichloroethane		89.8	78.7	123.1	9.1	30.0
Tetrachloroethene		88.4	74.5	124.5	9.3	30.0
trans-1,4-Dichloro-2-butene		94.1	68.6	135.4	14.6	30.0
Dibromochloromethane		100.7	74.6	127.2	10.6	30.0
1,2-Dibromoethane		94.7	70.3	133.7	8.4	30.0
Chlorobenzene		93.1	79.2	122.7	8.4	30.0

Organics - Volatiles, Prep Batch ID: VF200615W1 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200615A3.LCSDW15A, Parent Sample ID: 200615A3.LCSW15A

Run in Batch: 200615A3, Run Date: 06/15/2020 12:00, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		96.0	80.3	128.2	9.7	30.0
Ethylbenzene		95.7	79.5	129.1	9.1	30.0
p,m-Xylene		95.1	79.4	132.2	8.8	30.0
o-Xylene		95.2	80.2	131.0	7.9	30.0
Styrene		98.1	69.5	126.7	8.6	30.0
Isopropylbenzene		96.9	74.4	121.5	9.0	30.0
Bromoform		103.9	69.4	128.0	11.1	30.0
1,1,2,2-Tetrachloroethane		91.9	79.8	126.3	8.2	30.0
1,2,3-Trichloropropane		91.1	78.3	138.8	9.1	30.0
n-Propylbenzene		94.9	82.0	130.7	8.6	30.0
Bromobenzene		92.8	78.7	124.6	9.1	30.0
1,3,5-Trimethylbenzene		95.9	81.3	128.9	9.0	30.0
tert-Butylbenzene		94.2	80.7	128.9	9.7	30.0
1,2,4-Trimethylbenzene		96.7	81.4	130.8	9.0	30.0
sec-Butylbenzene		93.3	77.4	129.8	12.9	30.0
p-Isopropyltoluene		95.2	79.8	137.5	12.6	30.0
1,3-Dichlorobenzene		90.4	77.0	131.3	11.7	30.0
1,4-Dichlorobenzene		88.3	20.7	137.7	12.5	30.0
1,2-Dichlorobenzene		88.5	10.0	166.2	11.8	30.0
1,2,3-Trimethylbenzene		91.0	76.3	124.2	11.8	30.0
n-Butylbenzene		94.1	80.0	133.3	11.3	30.0
Hexachloroethane		101.3	23.8	138.1	14.8	30.0
1,2-Dibromo-3-chloropropane		97.4	21.2	189.4	9.2	30.0
1,2,4-Trichlorobenzene		94.7	27.4	143.4	10.5	30.0
1,2,3-Trichlorobenzene		91.1	75.4	131.4	9.0	30.0
Naphthalene		95.5	32.9	135.8	8.2	30.0
2-Methylnaphthalene		90.2	25.5	165.5	0.9	30.0

Organics - Volatiles, Prep Batch ID: VS200611W1

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

Blank (BLK)

Lab Sample ID: 200611A9.BLKS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:55, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 09:51, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.5	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611A9.LCSDS11A, Parent Sample ID: 200611A9.LCSS11A

Run in Batch: 200611A9, Run Date: 06/11/2020 10:12, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		96.4	70.0	130.0	10.8	30.0

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		94.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		105.0	70.0	130.0	10.7	30.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.4	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		111.3	70.0	130.0	7.2	30.0

1 cooler

Merit Laboratories, Inc.
2000 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

12828

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spruell
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 313 407 8337 FAX NO.: PO NO.:
E-MAIL ADDRESS: Michael.Spruell@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.03740 / Racer Lansing Plant 2
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz
TURNAROUND TIME REQUIRED: ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking W ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM5030C/8260C	1,4-Dioxane 8260B SIM	SVOCs SM8270D
14705.01	6-9-20	AM	Trip Blank	L	1		1						X		
.02	6-9-20	1000	MW-14-62_060920	GW	4	1	3						X	X	X
.03	6-9-20	0955	MW-14-57_060920	GW	3		3							X	
.04	6-9-20	1115	MW-14-59_060920	GW	4	1	3						X	X	X
.05	6-9-20	AM	Dup-01	GW	4	1	3						X	X	X
.06	6-9-20	1135	MW-14-54_060920	GW	3		3						X		
.07	6-9-20	1310	MW-14-60_060920	GW	4	1	3						X	X	X
.08	6-9-20	1325	MW-14-55_060920	GW	3		3						X		
.09	6-9-20	1425	MW-14-58_060920	GW	3		3						X	X	
.10	6-9-20	1540	MW-13-43_060920	GW	3		3							X	
.11	6-9-20	AM	EB-05_060920	L	3		3						X		

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 6.9.20	TIME 1630
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 6/9/20	TIME 1635
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Daniel Stanford	DATE 6/9/20	TIME 18:20
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 6/9/20	TIME 18:30

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE 6/9/20	TIM 17:0
RECEIVED BY: SIGNATURE/ORGANIZATION	Daniel Stanford	DATE 6/9/20	TIM 17:00
SEAL NO	SEAL INTACT YES ☐ NO ☐	INITIALS Merit Dropbox	
SEAL NO	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: 6/10/20 815 10/10 20 815 2.3
TEMP. ON ARRIVAL

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev.

Quality Control Report

Report ID: QC-S14757-02
Generated on 07/07/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14757.01-S14757.10
Project: 30042872.04700 / RACER Lansing Plant 3
Submitted Date/Time: 06/11/2020 08:15
Sampled by: Austin Westhuis
P.O. #: 30042872.04700

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-11)
Prep Batch Summary (Page 12)
Surrogates per Lab Sample (Pages 13-20)
Surrogates per QC Sample (Pages 21-25)
Batch QC Results (Pages 26-44)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S14757.01

Sample Tag: MW-13-49_061020

Collected Date/Time: 06/10/2020 10:10

Matrix: Groundwater

COC Reference: 128286

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 23:10	200611B9	VS200611W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14757.02

Sample Tag: MW-13-48_061020

Collected Date/Time: 06/10/2020 11:00

Matrix: Groundwater

COC Reference: 128286

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 23:32	200611B9	VS200611W2	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/15/20 15:17	200615A7	VF200615W2	Yes	BLK/LCS/LCSD/MS

Lab Sample ID: S14757.03

Sample Tag: MW-13-25_061020

Collected Date/Time: 06/10/2020 10:50

Matrix: Groundwater

COC Reference: 128286

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/11/20 23:54	200611B9	VS200611W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14757.04

Sample Tag: MW-13-34_061020

Collected Date/Time: 06/10/2020 12:00

Matrix: Groundwater

COC Reference: 128286

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 00:16	200611B9	VS200611W2	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 00:03	200612B3	VF200612W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14757.05

Sample Tag: MW-13-46_061020

Collected Date/Time: 06/10/2020 13:20

Matrix: Groundwater

COC Reference: 128286

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/16/20 15:57	200616B9	VS200616W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14757.06

Sample Tag: MW-13-29_061020

Collected Date/Time: 06/10/2020 12:20

Matrix: Groundwater

COC Reference: 128286

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 01:00	200611B9	VS200611W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14757.07

Sample Tag: PW-14-03_061020

Collected Date/Time: 06/10/2020 14:25

Matrix: Groundwater

COC Reference: 128286

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 01:23	200611B9	VS200611W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14757.08

Sample Tag: MW-13-24_061020

Collected Date/Time: 06/10/2020 13:55

Matrix: Groundwater

COC Reference: 128286

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/16/20 16:19	200616B9	VS200616W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14757.09

Sample Tag: MW-12-20_061020

Collected Date/Time: 06/10/2020 14:15

Matrix: Groundwater

COC Reference: 128286

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 02:07	200611B9	VS200611W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14757.10

Sample Tag: Trip Blank_061020

Collected Date/Time: 06/10/2020 00:01

Matrix: Water

COC Reference: 128286

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/11/20 21:32	200611B3	VF200611W2	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF200611W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14757.10	Volatile Organics - DEQ List	SW5030C/8260C	06/11/20 21:32	200611B3

Organics - Volatiles, Prep Batch ID: VF200612W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14757.04	Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 00:03	200612B3

Organics - Volatiles, Prep Batch ID: VF200615W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14757.02	Volatile Organics - DEQ List	SW5030C/8260C	06/15/20 15:17	200615A7

Organics - Volatiles, Prep Batch ID: VS200611W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14757.01	1,4-Dioxane	SW8260B - SIM	06/11/20 23:10	200611B9
S14757.02	1,4-Dioxane	SW8260B - SIM	06/11/20 23:32	200611B9
S14757.03	1,4-Dioxane	SW8260B - SIM	06/11/20 23:54	200611B9
S14757.04	1,4-Dioxane	SW8260B - SIM	06/12/20 00:16	200611B9
S14757.06	1,4-Dioxane	SW8260B - SIM	06/12/20 01:00	200611B9
S14757.07	1,4-Dioxane	SW8260B - SIM	06/12/20 01:23	200611B9
S14757.09	1,4-Dioxane	SW8260B - SIM	06/12/20 02:07	200611B9

Organics - Volatiles, Prep Batch ID: VS200616W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14757.05	1,4-Dioxane	SW8260B - SIM	06/16/20 15:57	200616B9
S14757.08	1,4-Dioxane	SW8260B - SIM	06/16/20 16:19	200616B9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14757.01

Sample Tag: MW-13-49_061020

Collected Date/Time: 06/10/2020 10:10

Matrix: Groundwater

COC Reference: 128286

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611B9, Run Date: 06/11/2020 23:10, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14757.02

Sample Tag: MW-13-48_061020

Collected Date/Time: 06/10/2020 11:00

Matrix: Groundwater

COC Reference: 128286

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611B9, Run Date: 06/11/2020 23:32, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200615A7, Run Date: 06/15/2020 15:17, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.9**	80.0	124.0
1,2-Dichloroethane-D4		**104.5**	72.0	125.0
Toluene-D8		**101.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14757.03

Sample Tag: MW-13-25_061020

Collected Date/Time: 06/10/2020 10:50

Matrix: Groundwater

COC Reference: 128286

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611B9, Run Date: 06/11/2020 23:54, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14757.04

Sample Tag: MW-13-34_061020

Collected Date/Time: 06/10/2020 12:00

Matrix: Groundwater

COC Reference: 128286

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611B9, Run Date: 06/12/2020 00:16, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200612B3, Run Date: 06/13/2020 00:03, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**90.0**	80.0	124.0
1,2-Dichloroethane-D4		**99.6**	72.0	125.0
Toluene-D8		**93.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14757.06

Sample Tag: MW-13-29_061020

Collected Date/Time: 06/10/2020 12:20

Matrix: Groundwater

COC Reference: 128286

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611B9, Run Date: 06/12/2020 01:00, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14757.07

Sample Tag: PW-14-03_061020

Collected Date/Time: 06/10/2020 14:25

Matrix: Groundwater

COC Reference: 128286

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611B9, Run Date: 06/12/2020 01:23, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14757.09

Sample Tag: MW-12-20_061020

Collected Date/Time: 06/10/2020 14:15

Matrix: Groundwater

COC Reference: 128286

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611B9, Run Date: 06/12/2020 02:07, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14757.10

Sample Tag: Trip Blank_061020

Collected Date/Time: 06/10/2020 00:01

Matrix: Water

COC Reference: 128286

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200611B3, Run Date: 06/11/2020 21:32, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**87.2**	80.0	124.0
1,2-Dichloroethane-D4		**96.8**	72.0	125.0
Toluene-D8		**92.4**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200611W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611B3.BLKW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 20:35, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**91.0**	80.0	124.0
1,2-Dichloroethane-D4		**95.6**	72.0	125.0
Toluene-D8		**92.8**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:18, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**103.2**	80.0	124.0
1,2-Dichloroethane-D4		**88.8**	72.0	125.0
Toluene-D8		**98.4**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611B3.LCSDW11B, Parent Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:38, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.6**	80.0	124.0
1,2-Dichloroethane-D4		**88.6**	72.0	125.0
Toluene-D8		**97.0**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200612W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200612B3.BLKW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 22:10, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**89.0**	80.0	124.0
1,2-Dichloroethane-D4		**93.6**	72.0	125.0
Toluene-D8		**92.8**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 20:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**103.0**	80.0	124.0
1,2-Dichloroethane-D4		**86.6**	72.0	125.0
Toluene-D8		**97.8**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612B3.LCSDW12B, Parent Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 21:13, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**104.0**	80.0	124.0
1,2-Dichloroethane-D4		**92.8**	72.0	125.0
Toluene-D8		**99.8**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200615W2

QC Types: BLK/LCS/LCSD/MS

Blank (BLK)

Lab Sample ID: 200615A7.BLKW15A

Run in Batch: 200615A7, Run Date: 06/15/2020 14:19, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.2**	80.0	124.0
1,2-Dichloroethane-D4		**102.9**	72.0	125.0
Toluene-D8		**100.6**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200615A7.LCSW15A

Run in Batch: 200615A7, Run Date: 06/15/2020 12:42, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**96.8**	80.0	124.0
1,2-Dichloroethane-D4		**97.7**	72.0	125.0
Toluene-D8		**100.8**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200615A7.LCSDW15A, Parent Sample ID: 200615A7.LCSW15A

Run in Batch: 200615A7, Run Date: 06/15/2020 13:01, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.2**	80.0	124.0
1,2-Dichloroethane-D4		**99.2**	72.0	125.0
Toluene-D8		**99.9**	89.0	112.0

Matrix Spike (MS)

Lab Sample ID: 200615A7.1461209M, Parent Sample ID: S14612.09

Run in Batch: 200615A7, Run Date: 06/15/2020 13:40, Prep Date: 06/15/2020, Matrix: WW, Dilution: 100

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.7**	80.0	124.0
1,2-Dichloroethane-D4		**106.5**	72.0	125.0
Toluene-D8		**100.4**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200611W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611B9.BLKS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 22:47, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611B9.LCSS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 21:44, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611B9.LCSDS11B, Parent Sample ID: 200611B9.LCSS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 22:05, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200616W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200616B9.BLKW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 13:47, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:23, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200616B9.LCSDW16A, Parent Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:44, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VF200611W2

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

Blank (BLK)

Lab Sample ID: 200611B3.BLKW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 20:35, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200611W2 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200611B3.BLKW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 20:35, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:18, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		87.4	67.4	121.2
Acetone		103.4	29.9	161.5
Methyl iodide		89.2	68.8	116.4
Carbon disulfide		90.0	63.8	137.4
tert-Methyl butyl ether (MTBE)		91.5	73.2	122.4
Acrylonitrile		90.8	69.9	128.9
2-Butanone (MEK)		83.2	44.0	134.4
Dichlorodifluoromethane		89.4	10.0	222.8
Chloromethane		88.5	23.8	166.5
Vinyl chloride		88.0	43.5	149.1
Bromomethane		88.1	56.8	151.3
Chloroethane		88.6	53.4	149.4
Trichlorofluoromethane		84.3	59.7	151.8
1,1-Dichloroethene		90.1	69.6	139.4
Methylene chloride		81.4	73.3	121.1
trans-1,2-Dichloroethene		89.1	73.6	129.3
1,1-Dichloroethane		88.0	71.5	126.2
cis-1,2-Dichloroethene		87.5	76.6	122.1
Tetrahydrofuran		89.0	59.0	117.9
Chloroform		86.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200611W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:18, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		87.6	78.2	120.8
1,1,1-Trichloroethane		89.8	79.4	130.9
4-Methyl-2-pentanone (MIBK)		94.4	71.6	125.2
2-Hexanone		94.9	55.4	136.9
Carbon tetrachloride		91.9	72.6	133.0
Benzene		91.9	79.9	124.9
1,2-Dichloroethane		87.1	76.0	126.3
Trichloroethene		92.2	79.7	124.2
1,2-Dichloropropane		92.1	78.6	126.4
Bromodichloromethane		92.4	80.4	128.2
Dibromomethane		91.3	76.9	122.1
cis-1,3-Dichloropropene		94.3	79.8	129.9
Toluene		92.4	79.8	124.5
trans-1,3-Dichloropropene		93.6	74.0	131.3
1,1,2-Trichloroethane		90.5	78.7	123.1
Tetrachloroethene		89.8	74.5	124.5
trans-1,4-Dichloro-2-butene		86.6	68.6	135.4
Dibromochloromethane		97.6	74.6	127.2
1,2-Dibromoethane		95.7	70.3	133.7
Chlorobenzene		95.8	79.2	122.7
1,1,1,2-Tetrachloroethane		96.2	80.3	128.2
Ethylbenzene		99.4	79.5	129.1
p,m-Xylene		98.3	79.4	132.2
o-Xylene		98.9	80.2	131.0
Styrene		101.4	69.5	126.7
Isopropylbenzene		100.8	74.4	121.5
Bromoform		97.0	69.4	128.0
1,1,2,2-Tetrachloroethane		93.9	79.8	126.3
1,2,3-Trichloropropane		92.8	78.3	138.8
n-Propylbenzene		98.1	82.0	130.7
Bromobenzene		94.3	78.7	124.6
1,3,5-Trimethylbenzene		98.2	81.3	128.9
tert-Butylbenzene		97.4	80.7	128.9
1,2,4-Trimethylbenzene		99.2	81.4	130.8
sec-Butylbenzene		97.5	77.4	129.8
p-Isopropyltoluene		98.6	79.8	137.5
1,3-Dichlorobenzene		93.6	77.0	131.3
1,4-Dichlorobenzene		91.2	20.7	137.7
1,2-Dichlorobenzene		92.0	10.0	166.2
1,2,3-Trimethylbenzene		94.7	76.3	124.2
n-Butylbenzene		96.0	80.0	133.3
Hexachloroethane		95.6	23.8	138.1
1,2-Dibromo-3-chloropropane		96.0	21.2	189.4
1,2,4-Trichlorobenzene		95.6	27.4	143.4
1,2,3-Trichlorobenzene		92.8	75.4	131.4
Naphthalene		99.1	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200611W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:18, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		86.0	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611B3.LCSDW11B, Parent Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:38, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		78.3	67.4	121.2	11.0	30.0
Acetone		93.4	29.9	161.5	10.2	30.0
Methyl iodide		78.3	68.8	116.4	13.1	30.0
Carbon disulfide		78.8	63.8	137.4	13.2	30.0
tert-Methyl butyl ether (MTBE)		81.3	73.2	122.4	11.9	30.0
Acrylonitrile		82.6	69.9	128.9	9.5	30.0
2-Butanone (MEK)		80.8	44.0	134.4	2.9	30.0
Dichlorodifluoromethane		76.5	10.0	222.8	15.6	30.0
Chloromethane		77.4	23.8	166.5	13.3	30.0
Vinyl chloride		77.1	43.5	149.1	13.2	30.0
Bromomethane		77.2	56.8	151.3	13.1	30.0
Chloroethane		78.0	53.4	149.4	12.7	30.0
Trichlorofluoromethane		72.0	59.7	151.8	15.8	30.0
1,1-Dichloroethene		78.5	69.6	139.4	13.8	30.0
Methylene chloride	*	72.1	73.3	121.1	12.1	30.0
trans-1,2-Dichloroethene		77.0	73.6	129.3	14.5	30.0
1,1-Dichloroethane		76.9	71.5	126.2	13.5	30.0
cis-1,2-Dichloroethene	*	76.5	76.6	122.1	13.4	30.0
Tetrahydrofuran		79.0	59.0	117.9	11.9	30.0
Chloroform	*	74.8	78.4	124.0	14.2	30.0
Bromochloromethane	*	77.3	78.2	120.8	12.5	30.0
1,1,1-Trichloroethane	*	77.6	79.4	130.9	14.5	30.0
4-Methyl-2-pentanone (MIBK)		84.0	71.6	125.2	11.6	30.0
2-Hexanone		84.3	55.4	136.9	11.9	30.0
Carbon tetrachloride		79.2	72.6	133.0	14.9	30.0
Benzene		80.3	79.9	124.9	13.5	30.0
1,2-Dichloroethane		77.7	76.0	126.3	11.4	30.0
Trichloroethene		80.6	79.7	124.2	13.5	30.0
1,2-Dichloropropane		82.0	78.6	126.4	11.6	30.0
Bromodichloromethane		81.0	80.4	128.2	13.1	30.0
Dibromomethane		81.2	76.9	122.1	11.7	30.0
cis-1,3-Dichloropropene		83.4	79.8	129.9	12.2	30.0
Toluene		80.6	79.8	124.5	13.7	30.0
trans-1,3-Dichloropropene		83.6	74.0	131.3	11.3	30.0
1,1,2-Trichloroethane		81.0	78.7	123.1	11.1	30.0
Tetrachloroethene		83.4	74.5	124.5	7.5	30.0
trans-1,4-Dichloro-2-butene		75.7	68.6	135.4	13.4	30.0
Dibromochloromethane		83.8	74.6	127.2	15.1	30.0
1,2-Dibromoethane		83.0	70.3	133.7	14.2	30.0
Chlorobenzene		82.0	79.2	122.7	15.5	30.0

Organics - Volatiles, Prep Batch ID: VF200611W2 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200611B3.LCSDW11B, Parent Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:38, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		83.4	80.3	128.2	14.3	30.0
Ethylbenzene		85.4	79.5	129.1	15.2	30.0
p,m-Xylene		84.8	79.4	132.2	14.7	30.0
o-Xylene		84.5	80.2	131.0	15.6	30.0
Styrene		88.0	69.5	126.7	14.2	30.0
Isopropylbenzene		85.9	74.4	121.5	16.0	30.0
Bromoform		84.3	69.4	128.0	14.0	30.0
1,1,2,2-Tetrachloroethane		81.6	79.8	126.3	13.9	30.0
1,2,3-Trichloropropane		81.0	78.3	138.8	13.6	30.0
n-Propylbenzene		84.1	82.0	130.7	15.3	30.0
Bromobenzene		82.2	78.7	124.6	13.7	30.0
1,3,5-Trimethylbenzene		85.0	81.3	128.9	14.4	30.0
tert-Butylbenzene		84.1	80.7	128.9	14.6	30.0
1,2,4-Trimethylbenzene		86.0	81.4	130.8	14.2	30.0
sec-Butylbenzene		86.5	77.4	129.8	12.0	30.0
p-Isopropyltoluene		87.9	79.8	137.5	11.5	30.0
1,3-Dichlorobenzene		83.6	77.0	131.3	11.3	30.0
1,4-Dichlorobenzene		81.7	20.7	137.7	10.9	30.0
1,2-Dichlorobenzene		82.2	10.0	166.2	11.3	30.0
1,2,3-Trimethylbenzene		84.5	76.3	124.2	11.4	30.0
n-Butylbenzene		85.8	80.0	133.3	11.2	30.0
Hexachloroethane		83.6	23.8	138.1	13.3	30.0
1,2-Dibromo-3-chloropropane		85.9	21.2	189.4	11.1	30.0
1,2,4-Trichlorobenzene		86.6	27.4	143.4	9.8	30.0
1,2,3-Trichlorobenzene		84.5	75.4	131.4	9.5	30.0
Naphthalene		89.8	32.9	135.8	9.9	30.0
2-Methylnaphthalene		83.5	25.5	165.5	3.0	30.0

Organics - Volatiles, Prep Batch ID: VF200612W2

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

Blank (BLK)

Lab Sample ID: 200612B3.BLKW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 22:10, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200612W2 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200612B3.BLKW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 22:10, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 20:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		87.1	67.4	121.2
Acetone		111.8	29.9	161.5
Methyl iodide		87.9	68.8	116.4
Carbon disulfide		90.1	63.8	137.4
tert-Methyl butyl ether (MTBE)		93.2	73.2	122.4
Acrylonitrile		90.7	69.9	128.9
2-Butanone (MEK)		82.6	44.0	134.4
Dichlorodifluoromethane		85.5	10.0	222.8
Chloromethane		86.5	23.8	166.5
Vinyl chloride		86.0	43.5	149.1
Bromomethane		83.0	56.8	151.3
Chloroethane		85.6	53.4	149.4
Trichlorofluoromethane		82.6	59.7	151.8
1,1-Dichloroethene		86.7	69.6	139.4
Methylene chloride		79.3	73.3	121.1
trans-1,2-Dichloroethene		86.3	73.6	129.3
1,1-Dichloroethane		86.5	71.5	126.2
cis-1,2-Dichloroethene		85.4	76.6	122.1
Tetrahydrofuran		90.8	59.0	117.9
Chloroform		84.6	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200612W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 20:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		86.6	78.2	120.8
1,1,1-Trichloroethane		89.5	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.2	71.6	125.2
2-Hexanone		99.7	55.4	136.9
Carbon tetrachloride		91.8	72.6	133.0
Benzene		91.1	79.9	124.9
1,2-Dichloroethane		86.5	76.0	126.3
Trichloroethene		92.0	79.7	124.2
1,2-Dichloropropane		91.7	78.6	126.4
Bromodichloromethane		92.7	80.4	128.2
Dibromomethane		91.6	76.9	122.1
cis-1,3-Dichloropropene		87.0	79.8	129.9
Toluene		92.3	79.8	124.5
trans-1,3-Dichloropropene		87.6	74.0	131.3
1,1,2-Trichloroethane		92.8	78.7	123.1
Tetrachloroethene		89.9	74.5	124.5
trans-1,4-Dichloro-2-butene		69.0	68.6	135.4
Dibromochloromethane		96.9	74.6	127.2
1,2-Dibromoethane		95.9	70.3	133.7
Chlorobenzene		93.5	79.2	122.7
1,1,1,2-Tetrachloroethane		94.2	80.3	128.2
Ethylbenzene		97.6	79.5	129.1
p,m-Xylene		96.2	79.4	132.2
o-Xylene		96.4	80.2	131.0
Styrene		97.5	69.5	126.7
Isopropylbenzene		98.6	74.4	121.5
Bromoform		98.8	69.4	128.0
1,1,2,2-Tetrachloroethane		93.4	79.8	126.3
1,2,3-Trichloropropane		92.3	78.3	138.8
n-Propylbenzene		95.1	82.0	130.7
Bromobenzene		93.4	78.7	124.6
1,3,5-Trimethylbenzene		96.1	81.3	128.9
tert-Butylbenzene		95.2	80.7	128.9
1,2,4-Trimethylbenzene		95.5	81.4	130.8
sec-Butylbenzene		98.2	77.4	129.8
p-Isopropyltoluene		98.8	79.8	137.5
1,3-Dichlorobenzene		94.4	77.0	131.3
1,4-Dichlorobenzene		92.8	20.7	137.7
1,2-Dichlorobenzene		93.7	10.0	166.2
1,2,3-Trimethylbenzene		96.8	76.3	124.2
n-Butylbenzene		92.9	80.0	133.3
Hexachloroethane		99.1	23.8	138.1
1,2-Dibromo-3-chloropropane		102.1	21.2	189.4
1,2,4-Trichlorobenzene		96.7	27.4	143.4
1,2,3-Trichlorobenzene		94.0	75.4	131.4
Naphthalene		102.3	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200612W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 20:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		89.1	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612B3.LCSDW12B, Parent Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 21:13, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		90.3	67.4	121.2	3.6	30.0
Acetone		107.1	29.9	161.5	4.3	30.0
Methyl iodide		90.1	68.8	116.4	2.4	30.0
Carbon disulfide		94.0	63.8	137.4	4.3	30.0
tert-Methyl butyl ether (MTBE)		96.7	73.2	122.4	3.6	30.0
Acrylonitrile		93.0	69.9	128.9	2.5	30.0
2-Butanone (MEK)		84.6	44.0	134.4	2.4	30.0
Dichlorodifluoromethane		84.8	10.0	222.8	0.8	30.0
Chloromethane		87.0	23.8	166.5	0.5	30.0
Vinyl chloride		87.7	43.5	149.1	2.0	30.0
Bromomethane		84.6	56.8	151.3	1.8	30.0
Chloroethane		86.6	53.4	149.4	1.1	30.0
Trichlorofluoromethane		82.7	59.7	151.8	0.2	30.0
1,1-Dichloroethene		89.0	69.6	139.4	2.7	30.0
Methylene chloride		83.0	73.3	121.1	4.5	30.0
trans-1,2-Dichloroethene		89.0	73.6	129.3	3.1	30.0
1,1-Dichloroethane		89.1	71.5	126.2	3.0	30.0
cis-1,2-Dichloroethene		88.3	76.6	122.1	3.3	30.0
Tetrahydrofuran		94.5	59.0	117.9	4.0	30.0
Chloroform		86.4	78.4	124.0	2.1	30.0
Bromochloromethane		89.3	78.2	120.8	3.1	30.0
1,1,1-Trichloroethane		89.5	79.4	130.9	0.1	30.0
4-Methyl-2-pentanone (MIBK)		99.9	71.6	125.2	1.6	30.0
2-Hexanone		101.5	55.4	136.9	1.8	30.0
Carbon tetrachloride		91.6	72.6	133.0	0.3	30.0
Benzene		92.3	79.9	124.9	1.3	30.0
1,2-Dichloroethane		88.4	76.0	126.3	2.2	30.0
Trichloroethene		93.1	79.7	124.2	1.2	30.0
1,2-Dichloropropane		94.2	78.6	126.4	2.7	30.0
Bromodichloromethane		94.8	80.4	128.2	2.2	30.0
Dibromomethane		94.1	76.9	122.1	2.7	30.0
cis-1,3-Dichloropropene		89.4	79.8	129.9	2.6	30.0
Toluene		93.2	79.8	124.5	1.0	30.0
trans-1,3-Dichloropropene		89.5	74.0	131.3	2.2	30.0
1,1,2-Trichloroethane		94.1	78.7	123.1	1.5	30.0
Tetrachloroethene		94.4	74.5	124.5	4.9	30.0
trans-1,4-Dichloro-2-butene		69.3	68.6	135.4	0.5	30.0
Dibromochloromethane		97.6	74.6	127.2	0.7	30.0
1,2-Dibromoethane		95.9	70.3	133.7	0.0	30.0
Chlorobenzene		94.1	79.2	122.7	0.6	30.0

Organics - Volatiles, Prep Batch ID: VF200612W2 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200612B3.LCSDW12B, Parent Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 21:13, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		95.9	80.3	128.2	1.8	30.0
Ethylbenzene		97.1	79.5	129.1	0.5	30.0
p,m-Xylene		95.8	79.4	132.2	0.4	30.0
o-Xylene		96.5	80.2	131.0	0.1	30.0
Styrene		97.0	69.5	126.7	0.5	30.0
Isopropylbenzene		98.5	74.4	121.5	0.1	30.0
Bromoform		98.5	69.4	128.0	0.3	30.0
1,1,2,2-Tetrachloroethane		93.7	79.8	126.3	0.4	30.0
1,2,3-Trichloropropane		93.1	78.3	138.8	0.8	30.0
n-Propylbenzene		94.7	82.0	130.7	0.4	30.0
Bromobenzene		93.8	78.7	124.6	0.4	30.0
1,3,5-Trimethylbenzene		95.9	81.3	128.9	0.2	30.0
tert-Butylbenzene		95.8	80.7	128.9	0.6	30.0
1,2,4-Trimethylbenzene		96.9	81.4	130.8	1.4	30.0
sec-Butylbenzene		94.7	77.4	129.8	3.7	30.0
p-Isopropyltoluene		95.8	79.8	137.5	3.1	30.0
1,3-Dichlorobenzene		90.7	77.0	131.3	4.1	30.0
1,4-Dichlorobenzene		89.0	20.7	137.7	4.2	30.0
1,2-Dichlorobenzene		89.9	10.0	166.2	4.1	30.0
1,2,3-Trimethylbenzene		92.5	76.3	124.2	4.6	30.0
n-Butylbenzene		91.9	80.0	133.3	1.0	30.0
Hexachloroethane		95.8	23.8	138.1	3.4	30.0
1,2-Dibromo-3-chloropropane		98.7	21.2	189.4	3.4	30.0
1,2,4-Trichlorobenzene		95.0	27.4	143.4	1.8	30.0
1,2,3-Trichlorobenzene		91.3	75.4	131.4	3.0	30.0
Naphthalene		99.2	32.9	135.8	3.1	30.0
2-Methylnaphthalene		87.8	25.5	165.5	1.5	30.0

Organics - Volatiles, Prep Batch ID: VF200615W2

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

Blank (BLK)

Lab Sample ID: 200615A7.BLKW15A

Run in Batch: 200615A7, Run Date: 06/15/2020 14:19, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	2.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF200615W2 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200615A7.BLKW15A

Run in Batch: 200615A7, Run Date: 06/15/2020 14:19, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200615A7.LCSW15A

Run in Batch: 200615A7, Run Date: 06/15/2020 12:42, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		104.6	67.4	121.2
Acetone		108.1	29.9	161.5
Methyl iodide		99.3	68.8	116.4
Carbon disulfide		102.6	63.8	137.4
tert-Methyl butyl ether (MTBE)		99.9	73.2	122.4
Acrylonitrile		106.1	69.9	128.9
2-Butanone (MEK)		105.3	44.0	134.4
Dichlorodifluoromethane		140.3	10.0	222.8
Chloromethane		115.4	23.8	166.5
Vinyl chloride		112.7	43.5	149.1
Bromomethane		99.0	56.8	151.3
Chloroethane		103.8	53.4	149.4
Trichlorofluoromethane		96.4	59.7	151.8
1,1-Dichloroethene		102.3	69.6	139.4
Methylene chloride		96.7	73.3	121.1
trans-1,2-Dichloroethene		103.5	73.6	129.3
1,1-Dichloroethane		104.7	71.5	126.2
cis-1,2-Dichloroethene		101.1	76.6	122.1
Tetrahydrofuran		104.3	59.0	117.9
Chloroform		101.3	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200615W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200615A7.LCSW15A

Run in Batch: 200615A7, Run Date: 06/15/2020 12:42, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		100.0	78.2	120.8
1,1,1-Trichloroethane		99.4	79.4	130.9
4-Methyl-2-pentanone (MIBK)		101.9	71.6	125.2
2-Hexanone		105.1	55.4	136.9
Carbon tetrachloride		94.7	72.6	133.0
Benzene		101.1	79.9	124.9
1,2-Dichloroethane		92.6	76.0	126.3
Trichloroethene		98.1	79.7	124.2
1,2-Dichloropropane		100.2	78.6	126.4
Bromodichloromethane		97.6	80.4	128.2
Dibromomethane		95.0	76.9	122.1
cis-1,3-Dichloropropene		98.8	79.8	129.9
Toluene		98.1	79.8	124.5
trans-1,3-Dichloropropene		98.4	74.0	131.3
1,1,2-Trichloroethane		97.6	78.7	123.1
Tetrachloroethene		90.7	74.5	124.5
trans-1,4-Dichloro-2-butene		94.4	68.6	135.4
Dibromochloromethane		91.3	74.6	127.2
1,2-Dibromoethane		93.9	70.3	133.7
Chlorobenzene		93.7	79.2	122.7
1,1,1,2-Tetrachloroethane		91.5	80.3	128.2
Ethylbenzene		96.8	79.5	129.1
p,m-Xylene		94.5	79.4	132.2
o-Xylene		94.5	80.2	131.0
Styrene		93.9	69.5	126.7
Isopropylbenzene		95.6	74.4	121.5
Bromoform		89.5	69.4	128.0
1,1,2,2-Tetrachloroethane		95.7	79.8	126.3
1,2,3-Trichloropropane		93.9	78.3	138.8
n-Propylbenzene		97.1	82.0	130.7
Bromobenzene		88.9	78.7	124.6
1,3,5-Trimethylbenzene		93.3	81.3	128.9
tert-Butylbenzene		91.6	80.7	128.9
1,2,4-Trimethylbenzene		93.1	81.4	130.8
sec-Butylbenzene		97.1	77.4	129.8
p-Isopropyltoluene		95.3	79.8	137.5
1,3-Dichlorobenzene		91.9	77.0	131.3
1,4-Dichlorobenzene		91.9	20.7	137.7
1,2-Dichlorobenzene		91.7	10.0	166.2
1,2,3-Trimethylbenzene		93.5	76.3	124.2
n-Butylbenzene		95.0	80.0	133.3
Hexachloroethane		88.7	23.8	138.1
1,2-Dibromo-3-chloropropane		95.2	21.2	189.4
1,2,4-Trichlorobenzene		90.0	27.4	143.4
1,2,3-Trichlorobenzene		90.1	75.4	131.4
Naphthalene		94.2	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200615W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200615A7.LCSW15A

Run in Batch: 200615A7, Run Date: 06/15/2020 12:42, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		94.7	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200615A7.LCSDW15A, Parent Sample ID: 200615A7.LCSW15A

Run in Batch: 200615A7, Run Date: 06/15/2020 13:01, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		115.5	67.4	121.2	9.9	30.0
Acetone		117.4	29.9	161.5	8.3	30.0
Methyl iodide		112.7	68.8	116.4	12.7	30.0
Carbon disulfide		115.9	63.8	137.4	12.2	30.0
tert-Methyl butyl ether (MTBE)		111.9	73.2	122.4	11.4	30.0
Acrylonitrile		118.8	69.9	128.9	11.3	30.0
2-Butanone (MEK)		117.3	44.0	134.4	10.8	30.0
Dichlorodifluoromethane		154.7	10.0	222.8	9.8	30.0
Chloromethane		129.9	23.8	166.5	11.8	30.0
Vinyl chloride		127.0	43.5	149.1	12.0	30.0
Bromomethane		110.2	56.8	151.3	10.7	30.0
Chloroethane		116.6	53.4	149.4	11.6	30.0
Trichlorofluoromethane		108.9	59.7	151.8	12.1	30.0
1,1-Dichloroethene		117.7	69.6	139.4	13.9	30.0
Methylene chloride		109.0	73.3	121.1	11.9	30.0
trans-1,2-Dichloroethene		116.9	73.6	129.3	12.1	30.0
1,1-Dichloroethane		116.9	71.5	126.2	11.0	30.0
cis-1,2-Dichloroethene		113.6	76.6	122.1	11.7	30.0
Tetrahydrofuran		116.3	59.0	117.9	10.9	30.0
Chloroform		113.6	78.4	124.0	11.4	30.0
Bromochloromethane		112.3	78.2	120.8	11.7	30.0
1,1,1-Trichloroethane		114.3	79.4	130.9	14.0	30.0
4-Methyl-2-pentanone (MIBK)		112.9	71.6	125.2	10.3	30.0
2-Hexanone		116.0	55.4	136.9	9.9	30.0
Carbon tetrachloride		108.7	72.6	133.0	13.7	30.0
Benzene		113.5	79.9	124.9	11.5	30.0
1,2-Dichloroethane		103.8	76.0	126.3	11.4	30.0
Trichloroethene		110.1	79.7	124.2	11.5	30.0
1,2-Dichloropropane		112.4	78.6	126.4	11.5	30.0
Bromodichloromethane		110.8	80.4	128.2	12.7	30.0
Dibromomethane		105.7	76.9	122.1	10.6	30.0
cis-1,3-Dichloropropene		110.1	79.8	129.9	10.8	30.0
Toluene		109.6	79.8	124.5	11.1	30.0
trans-1,3-Dichloropropene		109.3	74.0	131.3	10.4	30.0
1,1,2-Trichloroethane		108.2	78.7	123.1	10.4	30.0
Tetrachloroethene		101.4	74.5	124.5	11.1	30.0
trans-1,4-Dichloro-2-butene		103.9	68.6	135.4	9.6	30.0
Dibromochloromethane		104.7	74.6	127.2	13.7	30.0
1,2-Dibromoethane		105.6	70.3	133.7	11.7	30.0
Chlorobenzene		105.3	79.2	122.7	11.6	30.0

Organics - Volatiles, Prep Batch ID: VF200615W2 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200615A7.LCSDW15A, Parent Sample ID: 200615A7.LCSW15A

Run in Batch: 200615A7, Run Date: 06/15/2020 13:01, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		106.8	80.3	128.2	15.4	30.0
Ethylbenzene		109.3	79.5	129.1	12.1	30.0
p,m-Xylene		107.2	79.4	132.2	12.5	30.0
o-Xylene		108.0	80.2	131.0	13.4	30.0
Styrene		107.2	69.5	126.7	13.2	30.0
Isopropylbenzene		108.9	74.4	121.5	13.0	30.0
Bromoform		104.1	69.4	128.0	15.0	30.0
1,1,2,2-Tetrachloroethane		108.0	79.8	126.3	12.1	30.0
1,2,3-Trichloropropane		106.6	78.3	138.8	12.6	30.0
n-Propylbenzene		109.8	82.0	130.7	12.3	30.0
Bromobenzene		101.0	78.7	124.6	12.7	30.0
1,3,5-Trimethylbenzene		107.5	81.3	128.9	14.1	30.0
tert-Butylbenzene		105.4	80.7	128.9	14.0	30.0
1,2,4-Trimethylbenzene		105.0	81.4	130.8	12.1	30.0
sec-Butylbenzene		110.8	77.4	129.8	13.2	30.0
p-Isopropyltoluene		108.6	79.8	137.5	13.1	30.0
1,3-Dichlorobenzene		102.9	77.0	131.3	11.3	30.0
1,4-Dichlorobenzene		102.0	20.7	137.7	10.4	30.0
1,2-Dichlorobenzene		103.5	10.0	166.2	12.1	30.0
1,2,3-Trimethylbenzene		106.7	76.3	124.2	13.2	30.0
n-Butylbenzene		108.4	80.0	133.3	13.2	30.0
Hexachloroethane		103.7	23.8	138.1	15.7	30.0
1,2-Dibromo-3-chloropropane		108.0	21.2	189.4	12.6	30.0
1,2,4-Trichlorobenzene		101.4	27.4	143.4	12.0	30.0
1,2,3-Trichlorobenzene		100.4	75.4	131.4	10.8	30.0
Naphthalene		105.5	32.9	135.8	11.3	30.0
2-Methylnaphthalene		106.0	25.5	165.5	11.2	30.0

Matrix Spike (MS)

Lab Sample ID: 200615A7.1461209M, Parent Sample ID: S14612.09

Run in Batch: 200615A7, Run Date: 06/15/2020 13:40, Prep Date: 06/15/2020, Matrix: WW, Dilution: 100

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether	*	132.9	67.4	121.2
Acetone		111.3	29.9	161.5
Methyl iodide	*	120.1	68.8	116.4
Carbon disulfide		112.7	63.8	137.4
tert-Methyl butyl ether (MTBE)	*	129.9	73.2	122.4
Acrylonitrile	*	135.7	69.9	128.9
2-Butanone (MEK)		134.3	44.0	134.4
Dichlorodifluoromethane		142.5	10.0	222.8
Chloromethane		131.2	23.8	166.5
Vinyl chloride		123.0	43.5	149.1
Bromomethane		115.4	56.8	151.3
Chloroethane		120.8	53.4	149.4
Trichlorofluoromethane		105.2	59.7	151.8
1,1-Dichloroethene		116.9	69.6	139.4

Organics - Volatiles, Prep Batch ID: VF200615W2 (continued)

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

Matrix Spike (MS) (continued)

Lab Sample ID: 200615A7.1461209M, Parent Sample ID: S14612.09

Run in Batch: 200615A7, Run Date: 06/15/2020 13:40, Prep Date: 06/15/2020, Matrix: WW, Dilution: 100

Analyte	Flags	% Rec	LCL	UCL
Methylene chloride	*	121.4	73.3	121.1
trans-1,2-Dichloroethene		122.6	73.6	129.3
1,1-Dichloroethane	*	127.5	71.5	126.2
cis-1,2-Dichloroethene	*	124.9	76.6	122.1
Tetrahydrofuran	*	131.8	59.0	117.9
Chloroform	*	126.3	78.4	124.0
Bromochloromethane	*	127.8	78.2	120.8
1,1,1-Trichloroethane		118.0	79.4	130.9
4-Methyl-2-pentanone (MIBK)	*	131.6	71.6	125.2
2-Hexanone		132.9	55.4	136.9
Carbon tetrachloride		109.1	72.6	133.0
Benzene		122.4	79.9	124.9
1,2-Dichloroethane		117.6	76.0	126.3
Trichloroethene		117.1	79.7	124.2
1,2-Dichloropropane		125.1	78.6	126.4
Bromodichloromethane		124.3	80.4	128.2
Dibromomethane	*	122.4	76.9	122.1
cis-1,3-Dichloropropene		126.0	79.8	129.9
Toluene		118.1	79.8	124.5
trans-1,3-Dichloropropene		126.3	74.0	131.3
1,1,2-Trichloroethane	*	125.1	78.7	123.1
Tetrachloroethene		105.4	74.5	124.5
trans-1,4-Dichloro-2-butene		125.5	68.6	135.4
Dibromochloromethane		121.0	74.6	127.2
1,2-Dibromoethane		121.3	70.3	133.7
Chlorobenzene		117.0	79.2	122.7
1,1,1,2-Tetrachloroethane		118.6	80.3	128.2
Ethylbenzene		117.6	79.5	129.1
p,m-Xylene		115.2	79.4	132.2
o-Xylene		117.2	80.2	131.0
Styrene		118.1	69.5	126.7
Isopropylbenzene		116.1	74.4	121.5
Bromoform		119.4	69.4	128.0
1,1,2,2-Tetrachloroethane		125.5	79.8	126.3
1,2,3-Trichloropropane		123.7	78.3	138.8
n-Propylbenzene		116.9	82.0	130.7
Bromobenzene		113.9	78.7	124.6
1,3,5-Trimethylbenzene		116.2	81.3	128.9
tert-Butylbenzene		112.8	80.7	128.9
1,2,4-Trimethylbenzene		115.9	81.4	130.8
sec-Butylbenzene		114.8	77.4	129.8
p-Isopropyltoluene		114.4	79.8	137.5
1,3-Dichlorobenzene		114.4	77.0	131.3
1,4-Dichlorobenzene		115.4	20.7	137.7
1,2-Dichlorobenzene		117.4	10.0	166.2
1,2,3-Trimethylbenzene		117.5	76.3	124.2

Organics - Volatiles, Prep Batch ID: VF200615W2 (continued)

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

Matrix Spike (MS) (continued)

Lab Sample ID: 200615A7.1461209M, Parent Sample ID: S14612.09

Run in Batch: 200615A7, Run Date: 06/15/2020 13:40, Prep Date: 06/15/2020, Matrix: WW, Dilution: 100

Analyte	Flags	% Rec	LCL	UCL
n-Butylbenzene		113.2	80.0	133.3
Hexachloroethane		111.3	23.8	138.1
1,2-Dibromo-3-chloropropane		124.4	21.2	189.4
1,2,4-Trichlorobenzene		114.1	27.4	143.4
1,2,3-Trichlorobenzene		114.5	75.4	131.4
Naphthalene		120.6	32.9	135.8
2-Methylnaphthalene		118.1	25.5	165.5

Organics - Volatiles, Prep Batch ID: VS200611W2

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

Blank (BLK)

Lab Sample ID: 200611B9.BLKS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 22:47, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200611B9.LCSS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 21:44, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		91.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611B9.LCSDS11B, Parent Sample ID: 200611B9.LCSS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 22:05, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		91.9	70.0	130.0	0.2	30.0

Organics - Volatiles, Prep Batch ID: VS200616W1

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

Blank (BLK)

Lab Sample ID: 200616B9.BLKW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 13:47, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:23, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		101.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200616B9.LCSDW16A, Parent Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:44, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.9	70.0	130.0	6.6	30.0

Plant 3

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128286

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 313-407-8332 FAX NO.: 248-994-2241 P.O. NO.: 30042872.04700
E-MAIL ADDRESS: Michael.Spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700/RACER Lansing Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis/

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs sm6230C/8260C	1,4-Dioxane 8260B SIM
14757.01	6/10/20	1010	MW-13-49_061020	GW	3		3							X
.02	6/10/20	1100	MW-13-48_061020	GW	3		3						X	X
.03	6/10/20	1050	MW-13-25_061020	GW	3		3							X
.04	6/10/20	1200	MW-13-34_061020	GW	3		3						X	X
.05	6/10/20	1320	MW-13-46_061020	GW	3		3							X
.06	6/10/20	1220	MW-13-29_061020	GW	3		3							X
.07	6/10/20	1425	PW-14-03_061020	GW	3		3							X
.08	6/10/20	1355	MW-13-24_061020	GW	3		3							X
.09	6/10/20	1415	MW-12-20_061020	GW	3		3							X
.10	6/10/20	—	Trip Blank	GW	1		1						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: /Arcadis ☒ Sampler DATE: 6/10/20 TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit 24-hr Drop Box DATE: 6/10/20 TIME: 0850

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box DATE: 6/11/2020 TIME: 0815
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 6/11/2020 TIME: 0815

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S14758-02
Generated on 07/07/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14758.01-S14758.04
Project: 30042872 / RACER Lansing Plant 2
Submitted Date/Time: 06/11/2020 08:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-5)
Prep Batch Summary (Page 6)
Surrogates per Lab Sample (Pages 7-10)
Surrogates per QC Sample (Pages 11-13)
Batch QC Results (Pages 14-24)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S14758.01

Sample Tag: Trip Blank_061020

Collected Date/Time: 06/10/2020 00:01

Matrix: Water

COC Reference: 128284

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/11/20 21:52	200611B3	VF200611W2	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14758.02
Sample Tag: P2-MW-04_061020
Collected Date/Time: 06/10/2020 10:05
Matrix: Groundwater
COC Reference: 128284

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	06/16/20 23:30	P200616B	SF200615W01	Yes	BLK/LCS/LCSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 02:30	200611B9	VS200611W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14758.03
Sample Tag: MW-01(2)_061020
Collected Date/Time: 06/10/2020 11:20
Matrix: Groundwater
COC Reference: 128284

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/11/20 22:50	200611B3	VF200611W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14758.04

Sample Tag: MW-16-82_061020

Collected Date/Time: 06/10/2020 12:20

Matrix: Groundwater

COC Reference: 128284

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 02:52	200611B9	VS200611W2	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Semi-Volatiles, Prep Batch ID: SF200615W01

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14758.02	Semi-Volatile Organics - MDEQ	SW8270D	06/16/20 23:30	P200616B

Organics - Volatiles, Prep Batch ID: VF200611W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14758.01	Volatile Organics - DEQ List	SW5030C/8260C	06/11/20 21:52	200611B3
S14758.03	Volatile Organics - DEQ List	SW5030C/8260C	06/11/20 22:50	200611B3

Organics - Volatiles, Prep Batch ID: VS200611W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14758.02	1,4-Dioxane	SW8260B - SIM	06/12/20 02:30	200611B9
S14758.04	1,4-Dioxane	SW8260B - SIM	06/12/20 02:52	200611B9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14758.01

Sample Tag: Trip Blank_061020

Collected Date/Time: 06/10/2020 00:01

Matrix: Water

COC Reference: 128284

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200611B3, Run Date: 06/11/2020 21:52, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**88.0**	80.0	124.0
1,2-Dichloroethane-D4		**98.2**	72.0	125.0
Toluene-D8		**92.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14758.02

Sample Tag: P2-MW-04_061020

Collected Date/Time: 06/10/2020 10:05

Matrix: Groundwater

COC Reference: 128284

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200616B, Run Date: 06/16/2020 23:30, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**52.70**	10.0	110.0
2-Fluorobiphenyl		**110.40**	10.0	116.0
Nitrobenzene-D5		**94.30**	10.0	114.0
Phenol-D5		**38.60**	10.0	110.0
2,4,6-Tribromophenol		**103.70**	10.0	123.0
Terphenyl-D14		**104.10**	10.0	141.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611B9, Run Date: 06/12/2020 02:30, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14758.03

Sample Tag: MW-01(2)_061020

Collected Date/Time: 06/10/2020 11:20

Matrix: Groundwater

COC Reference: 128284

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200611B3, Run Date: 06/11/2020 22:50, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**89.6**	80.0	124.0
1,2-Dichloroethane-D4		**100.2**	72.0	125.0
Toluene-D8		**94.2**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14758.04

Sample Tag: MW-16-82_061020

Collected Date/Time: 06/10/2020 12:20

Matrix: Groundwater

COC Reference: 128284

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200611B9, Run Date: 06/12/2020 02:52, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Semi-Volatiles, Prep Batch ID: SF200615W01

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: p200616.blkw15a

Run in Batch: P200616, Run Date: 06/16/2020 15:19, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Blank (BLK)

Lab Sample ID: p200616b.blkw15a

Run in Batch: P200616B, Run Date: 06/16/2020 18:21, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**45.70**	10.0	110.0
2-Fluorobiphenyl		**88.70**	10.0	116.0
Nitrobenzene-D5		**84.90**	10.0	114.0
Phenol-D5		**31.10**	10.0	110.0
2,4,6-Tribromophenol		**86.80**	10.0	123.0
Terphenyl-D14		**94.10**	10.0	141.0

Laboratory Control Sample (LCS)

Lab Sample ID: p200616b.lcsw15a

Run in Batch: P200616B, Run Date: 06/16/2020 18:52, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**52.40**	10.0	110.0
2-Fluorobiphenyl		**97.40**	10.0	116.0
Nitrobenzene-D5		**91.20**	10.0	114.0
Phenol-D5		**38.70**	10.0	110.0
2,4,6-Tribromophenol		**90.70**	10.0	123.0
Terphenyl-D14		**99.70**	10.0	141.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: p200616b.lcsdw15a, Parent Sample ID: p200616b.lcsw15a

Run in Batch: P200616B, Run Date: 06/16/2020 19:24, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**44.80**	10.0	110.0
2-Fluorobiphenyl		**83.20**	10.0	116.0
Nitrobenzene-D5		**78.10**	10.0	114.0
Phenol-D5		**32.60**	10.0	110.0
2,4,6-Tribromophenol		**85.40**	10.0	123.0
Terphenyl-D14		**82.30**	10.0	141.0

Organics - Volatiles, Prep Batch ID: VF200611W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611B3.BLKW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 20:35, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**91.0**	80.0	124.0
1,2-Dichloroethane-D4		**95.6**	72.0	125.0
Toluene-D8		**92.8**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:18, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**103.2**	80.0	124.0
1,2-Dichloroethane-D4		**88.8**	72.0	125.0
Toluene-D8		**98.4**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611B3.LCSDW11B, Parent Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:38, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.6**	80.0	124.0
1,2-Dichloroethane-D4		**88.6**	72.0	125.0
Toluene-D8		**97.0**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200611W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200611B9.BLKS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 22:47, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200611B9.LCSS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 21:44, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611B9.LCSDS11B, Parent Sample ID: 200611B9.LCSS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 22:05, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Semi-Volatiles, Prep Batch ID: SF200615W01

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

Blank (BLK)

Lab Sample ID: p200616.blkw15a

Run in Batch: P200616, Run Date: 06/16/2020 15:19, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Benzo(a)pyrene		ND	0.01	ug/l
Hexachlorobenzene		ND	0.01	ug/l
Hexachlorobutadiene		ND	0.01	ug/l
Hexachlorocyclopentadiene		ND	0.01	ug/l

Blank (BLK)

Lab Sample ID: p200616b.blkw15a

Run in Batch: P200616B, Run Date: 06/16/2020 18:21, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acenaphthene		ND	0.5	ug/l
Acenaphthylene		ND	0.5	ug/l
Anthracene		ND	0.5	ug/l
Benzo(a)anthracene		ND	0.5	ug/l
Benzo(b)fluoranthene		ND	0.5	ug/l
Benzo(k)fluoranthene		ND	0.5	ug/l
Benzo(ghi)perylene		ND	0.5	ug/l
Benzo(a)pyrene		ND	0.5	ug/l
bis(2-Chloroethoxy)methane		ND	0.5	ug/l
bis(2-Chloroethyl)ether		ND	0.5	ug/l
bis(2-Chloroisopropyl)ether		ND	0.5	ug/l
bis(2-Ethylhexyl)phthalate		ND	0.5	ug/l
4-Bromophenyl phenyl ether		ND	0.5	ug/l
Butyl benzyl phthalate		ND	0.5	ug/l
4-Chloroaniline		ND	0.5	ug/l
2-Chloronaphthalene		ND	0.5	ug/l
4-Chloro-3-methylphenol		ND	0.5	ug/l
2-Chlorophenol		ND	0.5	ug/l
4-Chlorophenyl phenyl ether		ND	0.5	ug/l
Chrysene		ND	0.5	ug/l
3-, 4-Methylphenol (p,m-Cresol)		ND	1	ug/l
Dibenzo(ah)anthracene		ND	0.5	ug/l
Dibenzofuran		ND	0.5	ug/l
di-n-Butyl phthalate		ND	0.5	ug/l
1,2-Dichlorobenzene		ND	0.5	ug/l
1,3-Dichlorobenzene		ND	0.5	ug/l
1,4-Dichlorobenzene		ND	0.5	ug/l
3,3'-Dichlorobenzidine		ND	0.5	ug/l
2,4-Dichlorophenol		ND	0.5	ug/l
Diethyl phthalate		ND	0.5	ug/l
2,4-Dimethylphenol		ND	0.5	ug/l
Dimethyl phthalate		ND	0.5	ug/l
4,6-Dinitro-2-methylphenol		ND	0.5	ug/l
2,4-Dinitrophenol		ND	0.5	ug/l
2,4-Dinitrotoluene		ND	0.5	ug/l
2,6-Dinitrotoluene		ND	0.5	ug/l
1,2-Diphenylhydrazine		ND	0.5	ug/l

Organics - Semi-Volatiles, Prep Batch ID: SF200615W01 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: p200616b.blkw15a

Run in Batch: P200616B, Run Date: 06/16/2020 18:21, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
di-n-Octyl phthalate		ND	0.5	ug/l
Fluoranthene		ND	0.5	ug/l
Fluorene		ND	0.5	ug/l
Hexachlorobenzene		ND	0.5	ug/l
Hexachlorobutadiene		ND	0.5	ug/l
Hexachlorocyclopentadiene		ND	0.5	ug/l
Hexachloroethane		ND	0.5	ug/l
Indeno(1,2,3-cd)pyrene		ND	0.5	ug/l
Isophorone		ND	0.5	ug/l
2-Methylnaphthalene		ND	0.5	ug/l
Naphthalene		ND	0.5	ug/l
2-Nitroaniline		ND	0.5	ug/l
3-Nitroaniline		ND	0.5	ug/l
4-Nitroaniline		ND	0.5	ug/l
Nitrobenzene		ND	0.5	ug/l
2-Nitrophenol		ND	0.5	ug/l
4-Nitrophenol		ND	0.5	ug/l
N-Nitrosodiphenylamine		ND	0.5	ug/l
N-Nitrosodi-n-propylamine		ND	0.5	ug/l
Pentachlorophenol		ND	0.5	ug/l
Phenanthrene		ND	0.5	ug/l
Phenol		ND	0.5	ug/l
Pyrene		ND	0.5	ug/l
1,2,4-Trichlorobenzene		ND	0.5	ug/l
2,4,5-Trichlorophenol		ND	0.5	ug/l
2,4,6-Trichlorophenol		ND	0.5	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: p200616b.lcsw15a

Run in Batch: P200616B, Run Date: 06/16/2020 18:52, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		83.98	34.8	124.7
Acenaphthylene		90.34	16.9	140.7
Anthracene		90.88	38.1	115.5
Benzo(a)anthracene		92.66	40.7	115.5
Benzo(b)fluoranthene		98.42	43.3	119.4
Benzo(k)fluoranthene		90.42	41.2	116.9
Benzo(ghi)perylene		95.44	36.7	122.1
Benzo(a)pyrene		92.50	51.2	133.4
bis(2-Chloroethoxy)methane		84.10	48.3	105.4
bis(2-Chloroethyl)ether		72.64	43.4	101.8
bis(2-Chloroisopropyl)ether		63.32	33.2	105.8
bis(2-Ethylhexyl)phthalate		89.14	45.2	126.2
4-Bromophenyl phenyl ether		90.80	44.5	116.9
Butyl benzyl phthalate		85.94	47.4	121.6
4-Chloroaniline		55.28	33.4	89.4

Organics - Semi-Volatiles, Prep Batch ID: SF200615W01 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: p200616b.lcsw15a

Run in Batch: P200616B, Run Date: 06/16/2020 18:52, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Chloronaphthalene		81.36	50.3	108.3
4-Chloro-3-methylphenol		80.12	39.0	123.2
2-Chlorophenol		76.50	35.5	114.1
4-Chlorophenyl phenyl ether		87.88	52.2	116.5
Chrysene		91.62	28.9	136.7
3-, 4-Methylphenol (p,m-Cresol)		58.54	36.4	115.4
Dibenzo(ah)anthracene		85.06	33.8	132.4
Dibenzofuran		88.12	52.1	111.9
di-n-Butyl phthalate		93.98	48.1	121.8
1,2-Dichlorobenzene		64.32	9.6	166.2
1,3-Dichlorobenzene		61.82	36.8	105.8
1,4-Dichlorobenzene		61.14	20.7	137.7
3,3'-Dichlorobenzidine		76.96	26.1	103.7
2,4-Dichlorophenol		83.02	57.7	115.6
Diethyl phthalate		88.72	48.1	118.0
2,4-Dimethylphenol		82.92	43.4	114.9
Dimethyl phthalate		89.14	49.3	118.4
4,6-Dinitro-2-methylphenol		82.50	18.7	149.0
2,4-Dinitrophenol		69.70	10.0	171.2
2,4-Dinitrotoluene		87.50	35.8	126.7
2,6-Dinitrotoluene		91.06	48.0	119.1
1,2-Diphenylhydrazine		89.08	40.2	136.4
di-n-Octyl phthalate		99.02	45.7	123.1
Fluoranthene		93.94	43.0	127.9
Fluorene		88.02	37.1	110.3
Hexachlorobenzene		89.96	45.2	118.5
Hexachlorobutadiene		65.98	30.2	119.4
Hexachlorocyclopentadiene		75.68	10.0	271.8
Hexachloroethane		57.72	23.8	138.1
Indeno(1,2,3-cd)pyrene		92.42	41.5	116.9
Isophorone		84.18	44.9	107.5
2-Methylnaphthalene		75.06	25.5	165.5
Naphthalene		73.88	32.9	135.8
2-Nitroaniline		86.38	53.4	119.9
3-Nitroaniline		64.02	42.1	109.0
4-Nitroaniline		77.72	45.8	119.7
Nitrobenzene		71.46	41.7	110.1
2-Nitrophenol		82.24	54.4	109.5
4-Nitrophenol		47.68	15.4	122.0
N-Nitrosodiphenylamine		93.12	10.0	104.2
N-Nitrosodi-n-propylamine		75.84	35.8	109.3
Pentachlorophenol		72.94	10.3	139.1
Phenanthrene		89.24	31.8	123.3
Phenol		35.26	10.0	130.4
Pyrene		92.24	37.8	131.4
1,2,4-Trichlorobenzene		70.88	32.2	118.4

Organics - Semi-Volatiles, Prep Batch ID: SF200615W01 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: p200616b.lcsw15a

Run in Batch: P200616B, Run Date: 06/16/2020 18:52, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2,4,5-Trichlorophenol		91.54	48.9	118.8
2,4,6-Trichlorophenol		87.28	47.8	117.4

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: p200616b.lcsdw15a, Parent Sample ID: p200616b.lcsw15a

Run in Batch: P200616B, Run Date: 06/16/2020 19:24, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		73.26	34.8	124.7	13.6	30.0
Acenaphthylene		80.70	16.9	140.7	11.3	30.0
Anthracene		77.12	38.1	115.5	16.4	30.0
Benzo(a)anthracene		80.22	40.7	115.5	14.4	30.0
Benzo(b)fluoranthene		85.94	43.3	119.4	13.5	30.0
Benzo(k)fluoranthene		77.74	41.2	116.9	15.1	30.0
Benzo(ghi)perylene		82.54	36.7	122.1	14.5	30.0
Benzo(a)pyrene		82.30	51.2	133.4	11.7	30.0
bis(2-Chloroethoxy)methane		74.28	48.3	105.4	12.4	30.0
bis(2-Chloroethyl)ether		63.74	43.4	101.8	13.1	30.0
bis(2-Chloroisopropyl)ether		55.48	33.2	105.8	13.2	30.0
bis(2-Ethylhexyl)phthalate		77.34	45.2	126.2	14.2	30.0
4-Bromophenyl phenyl ether		78.82	44.5	116.9	14.1	30.0
Butyl benzyl phthalate		75.94	47.4	121.6	12.4	30.0
4-Chloroaniline		48.58	33.4	89.4	12.9	30.0
2-Chloronaphthalene		71.36	50.3	108.3	13.1	30.0
4-Chloro-3-methylphenol		71.88	39.0	123.2	10.8	30.0
2-Chlorophenol		67.26	35.5	114.1	12.9	30.0
4-Chlorophenyl phenyl ether		76.10	52.2	116.5	14.4	30.0
Chrysene		81.08	28.9	136.7	12.2	30.0
3-, 4-Methylphenol (p,m-Cresol)		50.94	36.4	115.4	13.9	30.0
Dibenzo(ah)anthracene		75.44	33.8	132.4	12.0	30.0
Dibenzofuran		76.78	52.1	111.9	13.8	30.0
di-n-Butyl phthalate		82.10	48.1	121.8	13.5	30.0
1,2-Dichlorobenzene		56.04	9.6	166.2	13.8	30.0
1,3-Dichlorobenzene		51.98	36.8	105.8	17.3	30.0
1,4-Dichlorobenzene		53.50	20.7	137.7	13.3	30.0
3,3'-Dichlorobenzidine		63.74	26.1	103.7	18.8	30.0
2,4-Dichlorophenol		74.54	57.7	115.6	10.8	30.0
Diethyl phthalate		76.14	48.1	118.0	15.3	30.0
2,4-Dimethylphenol		73.16	43.4	114.9	12.5	30.0
Dimethyl phthalate		77.12	49.3	118.4	14.5	30.0
4,6-Dinitro-2-methylphenol		75.12	18.7	149.0	9.4	30.0
2,4-Dinitrophenol		69.66	10.0	171.2	0.1	30.0
2,4-Dinitrotoluene		76.20	35.8	126.7	13.8	30.0
2,6-Dinitrotoluene		78.82	48.0	119.1	14.4	30.0
1,2-Diphenylhydrazine		78.14	40.2	136.4	13.1	30.0
di-n-Octyl phthalate		88.00	45.7	123.1	11.8	30.0
Fluoranthene		78.98	43.0	127.9	17.3	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF200615W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: p200616b.lcsdw15a, Parent Sample ID: p200616b.lcsw15a

Run in Batch: P200616B, Run Date: 06/16/2020 19:24, Prep Date: 06/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Fluorene		76.28	37.1	110.3	14.3	30.0
Hexachlorobenzene		82.16	45.2	118.5	9.1	30.0
Hexachlorobutadiene		59.24	30.2	119.4	10.8	30.0
Hexachlorocyclopentadiene		62.56	10.0	271.8	19.0	30.0
Hexachloroethane		49.28	23.8	138.1	15.8	30.0
Indeno(1,2,3-cd)pyrene		80.48	41.5	116.9	13.8	30.0
Isophorone		75.14	44.9	107.5	11.3	30.0
2-Methylnaphthalene		67.04	25.5	165.5	11.3	30.0
Naphthalene		65.80	32.9	135.8	11.6	30.0
2-Nitroaniline		76.76	53.4	119.9	11.8	30.0
3-Nitroaniline		55.06	42.1	109.0	15.0	30.0
4-Nitroaniline		68.82	45.8	119.7	12.1	30.0
Nitrobenzene		64.10	41.7	110.1	10.9	30.0
2-Nitrophenol		74.14	54.4	109.5	10.4	30.0
4-Nitrophenol		42.16	15.4	122.0	12.3	30.0
N-Nitrosodiphenylamine		82.10	10.0	104.2	12.6	30.0
N-Nitrosodi-n-propylamine		66.38	35.8	109.3	13.3	30.0
Pentachlorophenol		65.90	10.3	139.1	10.1	30.0
Phenanthrene		77.12	31.8	123.3	14.6	30.0
Phenol		31.50	10.0	130.4	11.3	30.0
Pyrene		83.14	37.8	131.4	10.4	30.0
1,2,4-Trichlorobenzene		61.50	32.2	118.4	14.2	30.0
2,4,5-Trichlorophenol		78.72	48.9	118.8	15.1	30.0
2,4,6-Trichlorophenol		76.90	47.8	117.4	12.6	30.0

Organics - Volatiles, Prep Batch ID: VF200611W2

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

Blank (BLK)

Lab Sample ID: 200611B3.BLKW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 20:35, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200611W2 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200611B3.BLKW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 20:35, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:18, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		87.4	67.4	121.2
Acetone		103.4	29.9	161.5
Methyl iodide		89.2	68.8	116.4
Carbon disulfide		90.0	63.8	137.4
tert-Methyl butyl ether (MTBE)		91.5	73.2	122.4
Acrylonitrile		90.8	69.9	128.9
2-Butanone (MEK)		83.2	44.0	134.4
Dichlorodifluoromethane		89.4	10.0	222.8
Chloromethane		88.5	23.8	166.5
Vinyl chloride		88.0	43.5	149.1
Bromomethane		88.1	56.8	151.3
Chloroethane		88.6	53.4	149.4
Trichlorofluoromethane		84.3	59.7	151.8
1,1-Dichloroethene		90.1	69.6	139.4
Methylene chloride		81.4	73.3	121.1
trans-1,2-Dichloroethene		89.1	73.6	129.3
1,1-Dichloroethane		88.0	71.5	126.2
cis-1,2-Dichloroethene		87.5	76.6	122.1
Tetrahydrofuran		89.0	59.0	117.9
Chloroform		86.2	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200611W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:18, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		87.6	78.2	120.8
1,1,1-Trichloroethane		89.8	79.4	130.9
4-Methyl-2-pentanone (MIBK)		94.4	71.6	125.2
2-Hexanone		94.9	55.4	136.9
Carbon tetrachloride		91.9	72.6	133.0
Benzene		91.9	79.9	124.9
1,2-Dichloroethane		87.1	76.0	126.3
Trichloroethene		92.2	79.7	124.2
1,2-Dichloropropane		92.1	78.6	126.4
Bromodichloromethane		92.4	80.4	128.2
Dibromomethane		91.3	76.9	122.1
cis-1,3-Dichloropropene		94.3	79.8	129.9
Toluene		92.4	79.8	124.5
trans-1,3-Dichloropropene		93.6	74.0	131.3
1,1,2-Trichloroethane		90.5	78.7	123.1
Tetrachloroethene		89.8	74.5	124.5
trans-1,4-Dichloro-2-butene		86.6	68.6	135.4
Dibromochloromethane		97.6	74.6	127.2
1,2-Dibromoethane		95.7	70.3	133.7
Chlorobenzene		95.8	79.2	122.7
1,1,1,2-Tetrachloroethane		96.2	80.3	128.2
Ethylbenzene		99.4	79.5	129.1
p,m-Xylene		98.3	79.4	132.2
o-Xylene		98.9	80.2	131.0
Styrene		101.4	69.5	126.7
Isopropylbenzene		100.8	74.4	121.5
Bromoform		97.0	69.4	128.0
1,1,2,2-Tetrachloroethane		93.9	79.8	126.3
1,2,3-Trichloropropane		92.8	78.3	138.8
n-Propylbenzene		98.1	82.0	130.7
Bromobenzene		94.3	78.7	124.6
1,3,5-Trimethylbenzene		98.2	81.3	128.9
tert-Butylbenzene		97.4	80.7	128.9
1,2,4-Trimethylbenzene		99.2	81.4	130.8
sec-Butylbenzene		97.5	77.4	129.8
p-Isopropyltoluene		98.6	79.8	137.5
1,3-Dichlorobenzene		93.6	77.0	131.3
1,4-Dichlorobenzene		91.2	20.7	137.7
1,2-Dichlorobenzene		92.0	10.0	166.2
1,2,3-Trimethylbenzene		94.7	76.3	124.2
n-Butylbenzene		96.0	80.0	133.3
Hexachloroethane		95.6	23.8	138.1
1,2-Dibromo-3-chloropropane		96.0	21.2	189.4
1,2,4-Trichlorobenzene		95.6	27.4	143.4
1,2,3-Trichlorobenzene		92.8	75.4	131.4
Naphthalene		99.1	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200611W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:18, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		86.0	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611B3.LCSDW11B, Parent Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:38, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		78.3	67.4	121.2	11.0	30.0
Acetone		93.4	29.9	161.5	10.2	30.0
Methyl iodide		78.3	68.8	116.4	13.1	30.0
Carbon disulfide		78.8	63.8	137.4	13.2	30.0
tert-Methyl butyl ether (MTBE)		81.3	73.2	122.4	11.9	30.0
Acrylonitrile		82.6	69.9	128.9	9.5	30.0
2-Butanone (MEK)		80.8	44.0	134.4	2.9	30.0
Dichlorodifluoromethane		76.5	10.0	222.8	15.6	30.0
Chloromethane		77.4	23.8	166.5	13.3	30.0
Vinyl chloride		77.1	43.5	149.1	13.2	30.0
Bromomethane		77.2	56.8	151.3	13.1	30.0
Chloroethane		78.0	53.4	149.4	12.7	30.0
Trichlorofluoromethane		72.0	59.7	151.8	15.8	30.0
1,1-Dichloroethene		78.5	69.6	139.4	13.8	30.0
Methylene chloride	*	72.1	73.3	121.1	12.1	30.0
trans-1,2-Dichloroethene		77.0	73.6	129.3	14.5	30.0
1,1-Dichloroethane		76.9	71.5	126.2	13.5	30.0
cis-1,2-Dichloroethene	*	76.5	76.6	122.1	13.4	30.0
Tetrahydrofuran		79.0	59.0	117.9	11.9	30.0
Chloroform	*	74.8	78.4	124.0	14.2	30.0
Bromochloromethane	*	77.3	78.2	120.8	12.5	30.0
1,1,1-Trichloroethane	*	77.6	79.4	130.9	14.5	30.0
4-Methyl-2-pentanone (MIBK)		84.0	71.6	125.2	11.6	30.0
2-Hexanone		84.3	55.4	136.9	11.9	30.0
Carbon tetrachloride		79.2	72.6	133.0	14.9	30.0
Benzene		80.3	79.9	124.9	13.5	30.0
1,2-Dichloroethane		77.7	76.0	126.3	11.4	30.0
Trichloroethene		80.6	79.7	124.2	13.5	30.0
1,2-Dichloropropane		82.0	78.6	126.4	11.6	30.0
Bromodichloromethane		81.0	80.4	128.2	13.1	30.0
Dibromomethane		81.2	76.9	122.1	11.7	30.0
cis-1,3-Dichloropropene		83.4	79.8	129.9	12.2	30.0
Toluene		80.6	79.8	124.5	13.7	30.0
trans-1,3-Dichloropropene		83.6	74.0	131.3	11.3	30.0
1,1,2-Trichloroethane		81.0	78.7	123.1	11.1	30.0
Tetrachloroethene		83.4	74.5	124.5	7.5	30.0
trans-1,4-Dichloro-2-butene		75.7	68.6	135.4	13.4	30.0
Dibromochloromethane		83.8	74.6	127.2	15.1	30.0
1,2-Dibromoethane		83.0	70.3	133.7	14.2	30.0
Chlorobenzene		82.0	79.2	122.7	15.5	30.0

Organics - Volatiles, Prep Batch ID: VF200611W2 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200611B3.LCSDW11B, Parent Sample ID: 200611B3.LCSW11B

Run in Batch: 200611B3, Run Date: 06/11/2020 19:38, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		83.4	80.3	128.2	14.3	30.0
Ethylbenzene		85.4	79.5	129.1	15.2	30.0
p,m-Xylene		84.8	79.4	132.2	14.7	30.0
o-Xylene		84.5	80.2	131.0	15.6	30.0
Styrene		88.0	69.5	126.7	14.2	30.0
Isopropylbenzene		85.9	74.4	121.5	16.0	30.0
Bromoform		84.3	69.4	128.0	14.0	30.0
1,1,2,2-Tetrachloroethane		81.6	79.8	126.3	13.9	30.0
1,2,3-Trichloropropane		81.0	78.3	138.8	13.6	30.0
n-Propylbenzene		84.1	82.0	130.7	15.3	30.0
Bromobenzene		82.2	78.7	124.6	13.7	30.0
1,3,5-Trimethylbenzene		85.0	81.3	128.9	14.4	30.0
tert-Butylbenzene		84.1	80.7	128.9	14.6	30.0
1,2,4-Trimethylbenzene		86.0	81.4	130.8	14.2	30.0
sec-Butylbenzene		86.5	77.4	129.8	12.0	30.0
p-Isopropyltoluene		87.9	79.8	137.5	11.5	30.0
1,3-Dichlorobenzene		83.6	77.0	131.3	11.3	30.0
1,4-Dichlorobenzene		81.7	20.7	137.7	10.9	30.0
1,2-Dichlorobenzene		82.2	10.0	166.2	11.3	30.0
1,2,3-Trimethylbenzene		84.5	76.3	124.2	11.4	30.0
n-Butylbenzene		85.8	80.0	133.3	11.2	30.0
Hexachloroethane		83.6	23.8	138.1	13.3	30.0
1,2-Dibromo-3-chloropropane		85.9	21.2	189.4	11.1	30.0
1,2,4-Trichlorobenzene		86.6	27.4	143.4	9.8	30.0
1,2,3-Trichlorobenzene		84.5	75.4	131.4	9.5	30.0
Naphthalene		89.8	32.9	135.8	9.9	30.0
2-Methylnaphthalene		83.5	25.5	165.5	3.0	30.0

Organics - Volatiles, Prep Batch ID: VS200611W2

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

Blank (BLK)

Lab Sample ID: 200611B9.BLKS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 22:47, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200611B9.LCSS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 21:44, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		91.8	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200611B9.LCSDS11B, Parent Sample ID: 200611B9.LCSS11B

Run in Batch: 200611B9, Run Date: 06/11/2020 22:05, Prep Date: 06/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		91.9	70.0	130.0	0.2	30.0

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128284

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Speil
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO: 248 994 2240 FAX NO. P.O. NO.
E-MAIL ADDRESS: Michael.speil@Arcadis.com QUOTE NO.

INVOICE TO

CONTACT NAME SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME: 30042872 / Pacer Lansing Plant 2
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM5230C / 8260C	1,4-Dioxane 8260C SIM	SVOCs SM8270D
147581.01	6-10-20	AM	Trip Blank	L	1		1						X		
.02	6-10-20	1005	PJ-MW-04_061020	GW	4	1	3							X	X
.03	6-10-20	1120	MW-01 (2)	GW	3		3						X		
.04	6-10-20	1220	MW-16-82_061020	GW	3		3							X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 6-10-20	TIME /
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit 24-hr Drop Box	DATE 6/11/20	TIME 0750
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 6/11/2020	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Pulcott	DATE 6/11/2020	TIME 0815
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: TEMP. ON ARRIVAL 2.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Quality Control Report

Report ID: QC-S14769-02
Generated on 07/07/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S14769.01-S14769.10
Project: 30042872.04700 / RACER Lansing Plant 3
Submitted Date/Time: 06/11/2020 14:00
Sampled by: Austin Westhuis
P.O. #: 30042872.04700

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-11)
Prep Batch Summary (Page 12)
Surrogates per Lab Sample (Pages 13-18)
Surrogates per QC Sample (Pages 19-21)
Batch QC Results (Pages 22-28)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S14769.01
Sample Tag: MW-02-02(3)_061120
Collected Date/Time: 06/11/2020 09:25
Matrix: Groundwater
COC Reference: 128287

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/16/20 16:41	200616B9	VS200616W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14769.02
Sample Tag: MW-19_061120
Collected Date/Time: 06/11/2020 10:45
Matrix: Groundwater
COC Reference: 128287

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 18:35	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 01:21	200612B3	VF200612W2	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S14769.03
Sample Tag: Dup-08_061120
Collected Date/Time: 06/11/2020 00:01
Matrix: Groundwater
COC Reference: 128287

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 18:57	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 01:40	200612B3	VF200612W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14769.04

Sample Tag: MW-12-21_061120

Collected Date/Time: 06/11/2020 09:00

Matrix: Groundwater

COC Reference: 128287

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/16/20 18:10	200616B9	VS200616W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 01:59	200612B3	VF200612W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14769.05

Sample Tag: MW-13-22_061120

Collected Date/Time: 06/11/2020 09:45

Matrix: Groundwater

COC Reference: 128287

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/12/20 19:41	200612A9	VS200612W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 02:18	200612B3	VF200612W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14769.06

Sample Tag: MW-15-71_061120

Collected Date/Time: 06/11/2020 10:40

Matrix: Groundwater

COC Reference: 128287

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/16/20 17:03	200616B9	VS200616W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14769.07

Sample Tag: MW-13-23_061120

Collected Date/Time: 06/11/2020 11:25

Matrix: Groundwater

COC Reference: 128287

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/16/20 17:26	200616B9	VS200616W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14769.08

Sample Tag: MW-14-64_061120

Collected Date/Time: 06/11/2020 11:35

Matrix: Groundwater

COC Reference: 128287

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/16/20 17:48	200616B9	VS200616W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S14769.09

Sample Tag: MW-13-41_061120

Collected Date/Time: 06/11/2020 12:40

Matrix: Groundwater

COC Reference: 128287

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 02:38	200612B3	VF200612W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S14769.10

Sample Tag: Trip Blank_061120

Collected Date/Time: 06/11/2020 00:01

Matrix: Water

COC Reference: 128287

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	06/12/20 22:29	200612B3	VF200612W2	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF200612W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14769.02	Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 01:21	200612B3
S14769.03	Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 01:40	200612B3
S14769.04	Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 01:59	200612B3
S14769.05	Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 02:18	200612B3
S14769.09	Volatile Organics - DEQ List	SW5030C/8260C	06/13/20 02:38	200612B3
S14769.10	Volatile Organics - DEQ List	SW5030C/8260C	06/12/20 22:29	200612B3

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14769.02	1,4-Dioxane	SW8260B - SIM	06/12/20 18:35	200612A9
S14769.03	1,4-Dioxane	SW8260B - SIM	06/12/20 18:57	200612A9
S14769.05	1,4-Dioxane	SW8260B - SIM	06/12/20 19:41	200612A9

Organics - Volatiles, Prep Batch ID: VS200616W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S14769.01	1,4-Dioxane	SW8260B - SIM	06/16/20 16:41	200616B9
S14769.04	1,4-Dioxane	SW8260B - SIM	06/16/20 18:10	200616B9
S14769.06	1,4-Dioxane	SW8260B - SIM	06/16/20 17:03	200616B9
S14769.07	1,4-Dioxane	SW8260B - SIM	06/16/20 17:26	200616B9
S14769.08	1,4-Dioxane	SW8260B - SIM	06/16/20 17:48	200616B9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14769.02

Sample Tag: MW-19_061120

Collected Date/Time: 06/11/2020 10:45

Matrix: Groundwater

COC Reference: 128287

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 18:35, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200612B3, Run Date: 06/13/2020 01:21, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**90.8**	80.0	124.0
1,2-Dichloroethane-D4		**94.2**	72.0	125.0
Toluene-D8		**93.8**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14769.03

Sample Tag: Dup-08_061120

Collected Date/Time: 06/11/2020 00:01

Matrix: Groundwater

COC Reference: 128287

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 18:57, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200612B3, Run Date: 06/13/2020 01:40, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**87.8**	80.0	124.0
1,2-Dichloroethane-D4		**91.6**	72.0	125.0
Toluene-D8		**94.2**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14769.04

Sample Tag: MW-12-21_061120

Collected Date/Time: 06/11/2020 09:00

Matrix: Groundwater

COC Reference: 128287

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200612B3, Run Date: 06/13/2020 01:59, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**89.6**	80.0	124.0
1,2-Dichloroethane-D4		**101.8**	72.0	125.0
Toluene-D8		**94.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14769.05

Sample Tag: MW-13-22_061120

Collected Date/Time: 06/11/2020 09:45

Matrix: Groundwater

COC Reference: 128287

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200612A9, Run Date: 06/12/2020 19:41, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200612B3, Run Date: 06/13/2020 02:18, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**86.2**	80.0	124.0
1,2-Dichloroethane-D4		**95.6**	72.0	125.0
Toluene-D8		**94.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14769.09

Sample Tag: MW-13-41_061120

Collected Date/Time: 06/11/2020 12:40

Matrix: Groundwater

COC Reference: 128287

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200612B3, Run Date: 06/13/2020 02:38, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**90.0**	80.0	124.0
1,2-Dichloroethane-D4		**103.2**	72.0	125.0
Toluene-D8		**93.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S14769.10

Sample Tag: Trip Blank_061120

Collected Date/Time: 06/11/2020 00:01

Matrix: Water

COC Reference: 128287

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200612B3, Run Date: 06/12/2020 22:29, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**88.4**	80.0	124.0
1,2-Dichloroethane-D4		**90.0**	72.0	125.0
Toluene-D8		**93.0**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200612W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200612B3.BLKW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 22:10, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**89.0**	80.0	124.0
1,2-Dichloroethane-D4		**93.6**	72.0	125.0
Toluene-D8		**92.8**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 20:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**103.0**	80.0	124.0
1,2-Dichloroethane-D4		**86.6**	72.0	125.0
Toluene-D8		**97.8**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612B3.LCSDW12B, Parent Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 21:13, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**104.0**	80.0	124.0
1,2-Dichloroethane-D4		**92.8**	72.0	125.0
Toluene-D8		**99.8**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VS200612W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**70.0**	60.0	140.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)	*	**50.0**	60.0	140.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D (S)		**60.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200616W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200616B9.BLKW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 13:47, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:23, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200616B9.LCSDW16A, Parent Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:44, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VF200612W2

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

Blank (BLK)

Lab Sample ID: 200612B3.BLKW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 22:10, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

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

Organics - Volatiles, Prep Batch ID: VF200612W2 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 200612B3.BLKW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 22:10, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

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

Laboratory Control Sample (LCS)

Lab Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 20:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		87.1	67.4	121.2
Acetone		111.8	29.9	161.5
Methyl iodide		87.9	68.8	116.4
Carbon disulfide		90.1	63.8	137.4
tert-Methyl butyl ether (MTBE)		93.2	73.2	122.4
Acrylonitrile		90.7	69.9	128.9
2-Butanone (MEK)		82.6	44.0	134.4
Dichlorodifluoromethane		85.5	10.0	222.8
Chloromethane		86.5	23.8	166.5
Vinyl chloride		86.0	43.5	149.1
Bromomethane		83.0	56.8	151.3
Chloroethane		85.6	53.4	149.4
Trichlorofluoromethane		82.6	59.7	151.8
1,1-Dichloroethene		86.7	69.6	139.4
Methylene chloride		79.3	73.3	121.1
trans-1,2-Dichloroethene		86.3	73.6	129.3
1,1-Dichloroethane		86.5	71.5	126.2
cis-1,2-Dichloroethene		85.4	76.6	122.1
Tetrahydrofuran		90.8	59.0	117.9
Chloroform		84.6	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200612W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 20:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		86.6	78.2	120.8
1,1,1-Trichloroethane		89.5	79.4	130.9
4-Methyl-2-pentanone (MIBK)		98.2	71.6	125.2
2-Hexanone		99.7	55.4	136.9
Carbon tetrachloride		91.8	72.6	133.0
Benzene		91.1	79.9	124.9
1,2-Dichloroethane		86.5	76.0	126.3
Trichloroethene		92.0	79.7	124.2
1,2-Dichloropropane		91.7	78.6	126.4
Bromodichloromethane		92.7	80.4	128.2
Dibromomethane		91.6	76.9	122.1
cis-1,3-Dichloropropene		87.0	79.8	129.9
Toluene		92.3	79.8	124.5
trans-1,3-Dichloropropene		87.6	74.0	131.3
1,1,2-Trichloroethane		92.8	78.7	123.1
Tetrachloroethene		89.9	74.5	124.5
trans-1,4-Dichloro-2-butene		69.0	68.6	135.4
Dibromochloromethane		96.9	74.6	127.2
1,2-Dibromoethane		95.9	70.3	133.7
Chlorobenzene		93.5	79.2	122.7
1,1,1,2-Tetrachloroethane		94.2	80.3	128.2
Ethylbenzene		97.6	79.5	129.1
p,m-Xylene		96.2	79.4	132.2
o-Xylene		96.4	80.2	131.0
Styrene		97.5	69.5	126.7
Isopropylbenzene		98.6	74.4	121.5
Bromoform		98.8	69.4	128.0
1,1,2,2-Tetrachloroethane		93.4	79.8	126.3
1,2,3-Trichloropropane		92.3	78.3	138.8
n-Propylbenzene		95.1	82.0	130.7
Bromobenzene		93.4	78.7	124.6
1,3,5-Trimethylbenzene		96.1	81.3	128.9
tert-Butylbenzene		95.2	80.7	128.9
1,2,4-Trimethylbenzene		95.5	81.4	130.8
sec-Butylbenzene		98.2	77.4	129.8
p-Isopropyltoluene		98.8	79.8	137.5
1,3-Dichlorobenzene		94.4	77.0	131.3
1,4-Dichlorobenzene		92.8	20.7	137.7
1,2-Dichlorobenzene		93.7	10.0	166.2
1,2,3-Trimethylbenzene		96.8	76.3	124.2
n-Butylbenzene		92.9	80.0	133.3
Hexachloroethane		99.1	23.8	138.1
1,2-Dibromo-3-chloropropane		102.1	21.2	189.4
1,2,4-Trichlorobenzene		96.7	27.4	143.4
1,2,3-Trichlorobenzene		94.0	75.4	131.4
Naphthalene		102.3	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200612W2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 20:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		89.1	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612B3.LCSDW12B, Parent Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 21:13, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		90.3	67.4	121.2	3.6	30.0
Acetone		107.1	29.9	161.5	4.3	30.0
Methyl iodide		90.1	68.8	116.4	2.4	30.0
Carbon disulfide		94.0	63.8	137.4	4.3	30.0
tert-Methyl butyl ether (MTBE)		96.7	73.2	122.4	3.6	30.0
Acrylonitrile		93.0	69.9	128.9	2.5	30.0
2-Butanone (MEK)		84.6	44.0	134.4	2.4	30.0
Dichlorodifluoromethane		84.8	10.0	222.8	0.8	30.0
Chloromethane		87.0	23.8	166.5	0.5	30.0
Vinyl chloride		87.7	43.5	149.1	2.0	30.0
Bromomethane		84.6	56.8	151.3	1.8	30.0
Chloroethane		86.6	53.4	149.4	1.1	30.0
Trichlorofluoromethane		82.7	59.7	151.8	0.2	30.0
1,1-Dichloroethene		89.0	69.6	139.4	2.7	30.0
Methylene chloride		83.0	73.3	121.1	4.5	30.0
trans-1,2-Dichloroethene		89.0	73.6	129.3	3.1	30.0
1,1-Dichloroethane		89.1	71.5	126.2	3.0	30.0
cis-1,2-Dichloroethene		88.3	76.6	122.1	3.3	30.0
Tetrahydrofuran		94.5	59.0	117.9	4.0	30.0
Chloroform		86.4	78.4	124.0	2.1	30.0
Bromochloromethane		89.3	78.2	120.8	3.1	30.0
1,1,1-Trichloroethane		89.5	79.4	130.9	0.1	30.0
4-Methyl-2-pentanone (MIBK)		99.9	71.6	125.2	1.6	30.0
2-Hexanone		101.5	55.4	136.9	1.8	30.0
Carbon tetrachloride		91.6	72.6	133.0	0.3	30.0
Benzene		92.3	79.9	124.9	1.3	30.0
1,2-Dichloroethane		88.4	76.0	126.3	2.2	30.0
Trichloroethene		93.1	79.7	124.2	1.2	30.0
1,2-Dichloropropane		94.2	78.6	126.4	2.7	30.0
Bromodichloromethane		94.8	80.4	128.2	2.2	30.0
Dibromomethane		94.1	76.9	122.1	2.7	30.0
cis-1,3-Dichloropropene		89.4	79.8	129.9	2.6	30.0
Toluene		93.2	79.8	124.5	1.0	30.0
trans-1,3-Dichloropropene		89.5	74.0	131.3	2.2	30.0
1,1,2-Trichloroethane		94.1	78.7	123.1	1.5	30.0
Tetrachloroethene		94.4	74.5	124.5	4.9	30.0
trans-1,4-Dichloro-2-butene		69.3	68.6	135.4	0.5	30.0
Dibromochloromethane		97.6	74.6	127.2	0.7	30.0
1,2-Dibromoethane		95.9	70.3	133.7	0.0	30.0
Chlorobenzene		94.1	79.2	122.7	0.6	30.0

Organics - Volatiles, Prep Batch ID: VF200612W2 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200612B3.LCSDW12B, Parent Sample ID: 200612B3.LCSW12B

Run in Batch: 200612B3, Run Date: 06/12/2020 21:13, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		95.9	80.3	128.2	1.8	30.0
Ethylbenzene		97.1	79.5	129.1	0.5	30.0
p,m-Xylene		95.8	79.4	132.2	0.4	30.0
o-Xylene		96.5	80.2	131.0	0.1	30.0
Styrene		97.0	69.5	126.7	0.5	30.0
Isopropylbenzene		98.5	74.4	121.5	0.1	30.0
Bromoform		98.5	69.4	128.0	0.3	30.0
1,1,2,2-Tetrachloroethane		93.7	79.8	126.3	0.4	30.0
1,2,3-Trichloropropane		93.1	78.3	138.8	0.8	30.0
n-Propylbenzene		94.7	82.0	130.7	0.4	30.0
Bromobenzene		93.8	78.7	124.6	0.4	30.0
1,3,5-Trimethylbenzene		95.9	81.3	128.9	0.2	30.0
tert-Butylbenzene		95.8	80.7	128.9	0.6	30.0
1,2,4-Trimethylbenzene		96.9	81.4	130.8	1.4	30.0
sec-Butylbenzene		94.7	77.4	129.8	3.7	30.0
p-Isopropyltoluene		95.8	79.8	137.5	3.1	30.0
1,3-Dichlorobenzene		90.7	77.0	131.3	4.1	30.0
1,4-Dichlorobenzene		89.0	20.7	137.7	4.2	30.0
1,2-Dichlorobenzene		89.9	10.0	166.2	4.1	30.0
1,2,3-Trimethylbenzene		92.5	76.3	124.2	4.6	30.0
n-Butylbenzene		91.9	80.0	133.3	1.0	30.0
Hexachloroethane		95.8	23.8	138.1	3.4	30.0
1,2-Dibromo-3-chloropropane		98.7	21.2	189.4	3.4	30.0
1,2,4-Trichlorobenzene		95.0	27.4	143.4	1.8	30.0
1,2,3-Trichlorobenzene		91.3	75.4	131.4	3.0	30.0
Naphthalene		99.2	32.9	135.8	3.1	30.0
2-Methylnaphthalene		87.8	25.5	165.5	1.5	30.0

Organics - Volatiles, Prep Batch ID: VS200612W1

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

Blank (BLK)

Lab Sample ID: 200612A9.BLKS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 13:08, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:05, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		94.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200612A9.LCSDS12A, Parent Sample ID: 200612A9.LCSS12A

Run in Batch: 200612A9, Run Date: 06/12/2020 12:26, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		105.0	70.0	130.0	10.7	30.0

Matrix Spike (MS)

Lab Sample ID: 200612A9.1465302M, Parent Sample ID: S14653.01

Run in Batch: 200612A9, Run Date: 06/12/2020 21:54, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.4	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200612A9.1465303N, Parent Sample ID: 200612A9.1465302M

Run in Batch: 200612A9, Run Date: 06/12/2020 22:16, Prep Date: 06/12/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		111.3	70.0	130.0	7.2	30.0

Organics - Volatiles, Prep Batch ID: VS200616W1

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

Blank (BLK)

Lab Sample ID: 200616B9.BLKW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 13:47, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:23, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		101.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200616B9.LCSDW16A, Parent Sample ID: 200616B9.LCSW16A

Run in Batch: 200616B9, Run Date: 06/16/2020 12:44, Prep Date: 06/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.9	70.0	130.0	6.6	30.0

Merit Laboratories, Inc.
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www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128287

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 313-407-8332 FAX NO.: 248-994-2241 P.O. NO.: 30042872.04700
E-MAIL ADDRESS: Michael.Spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700 / RACER Lansing Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM6200C/8260C	1,4-Dioxane 8260B SIMS
14769.01	6/11/20	0925	MW-02-02(3)_061120	GW	3		3							X
.02	6/11/20	1045	MW-19_061120	GW	3		3						X	X
.03	6/11/20	—	Dup-08_061120	GW	3		3						X	X
.04	6/11/20	0900	MW-12-21_061120	GW	3		3						X	X
.05	6/11/20	0945	MW-13-22_061120	GW	3		3						X	X
.06	6/11/20	1040	MW-15-71_061120	GW	3		3							X
.07	6/11/20	1125	MW-13-23_061120	GW	3		3							X
.08	6/11/20	1135	MW-14-64_061120	GW	3		3							X
.09	6/11/20	1240	MW-13-41_061120	GW	3		3						X	
.10	6/11/20	—	Trip Blank	GW	1		1						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	[signature] / Arcadis ☒ Sampler	DATE 6/11/20	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit 24-hr Drop Box	DATE 6/11/20	TIME 1400
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 6/11/20	TIME 1400
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	DATE 6/11/20	TIME 1400

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18

Quality Control Report

Report ID: QC-S15102-01
Generated on 07/06/2020

Report to

Attention: Trevor Swarthout
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2240 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S15102.01-S15102.02
Project: 30042872.04700 / RACER Lansing Plant 3
Submitted Date/Time: 06/23/2020 15:40
Sampled by: Marina Samp
P.O. #: 30042872.04700

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-3)
Prep Batch Summary (Page 4)
Surrogates per QC Sample (Pages 5-6)
Batch QC Results (Pages 7-11)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S15102.01
Sample Tag: TW-14-06_062320
Collected Date/Time: 06/23/2020 11:50
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	06/24/20 09:11	NTRA200624-W1-B	NTRA200624-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	06/24/20 20:11	TKN200624QC	TKN200624QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	06/25/20 14:48	PHS200625QC	PHS200625QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	06/25/20 14:03	200625A9	VS200625W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S15102.02
Sample Tag: TW-15-11_062320
Collected Date/Time: 06/23/2020 14:00
Matrix: Groundwater
COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	07/01/20 13:52	200701B9	VS200701W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: NTRA200624-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15102.01	Nitrate-N	E300.0	06/24/20 09:11	NTRA200624-W1-B

Inorganics, Prep Batch ID: PHS200625QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15102.01	Total Phosphorus	SM4500-PE	06/25/20 14:48	PHS200625QC

Inorganics, Prep Batch ID: TKN200624QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15102.01	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	06/24/20 20:11	TKN200624QC

Organics - Volatiles, Prep Batch ID: VS200625W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15102.01	1,4-Dioxane	SW8260B - SIM	06/25/20 14:03	200625A9

Organics - Volatiles, Prep Batch ID: VS200701W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15102.02	1,4-Dioxane	SW8260B - SIM	07/01/20 13:52	200701B9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200625W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200625A9.BLKW25A

Run in Batch: 200625A9, Run Date: 06/25/2020 10:44, Prep Date: 06/25/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200625A9.LCSW25A

Run in Batch: 200625A9, Run Date: 06/25/2020 09:40, Prep Date: 06/25/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200625A9.LCSDW25A, Parent Sample ID: 200625A9.LCSW25A

Run in Batch: 200625A9, Run Date: 06/25/2020 10:02, Prep Date: 06/25/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200701W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200701B9.BLKW01A

Run in Batch: 200701B9, Run Date: 07/01/2020 12:47, Prep Date: 07/01/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200701B9.LCSW01A

Run in Batch: 200701B9, Run Date: 07/01/2020 11:23, Prep Date: 07/01/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200701B9.LCSDW01A, Parent Sample ID: 200701B9.LCSW01A

Run in Batch: 200701B9, Run Date: 07/01/2020 11:44, Prep Date: 07/01/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Inorganics, Prep Batch ID: NTRA200624-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA200624-W1-B.LRB1

Run in Batch: NTRA200624-W1-B, Run Date: 06/24/2020 08:07, Prep Date: 06/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA200624-W1-B.LCS1

Run in Batch: NTRA200624-W1-B, Run Date: 06/24/2020 08:33, Prep Date: 06/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		98	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA200624-W1-B.MS1, Parent Sample ID: S15111.01

Run in Batch: NTRA200624-W1-B, Run Date: 06/24/2020 09:50, Prep Date: 06/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		106	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA200624-W1-B.MSD1, Parent Sample ID: NTRA200624-W1-B.MS1

Run in Batch: NTRA200624-W1-B, Run Date: 06/24/2020 10:03, Prep Date: 06/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		107	80	120	0	15

Duplicate (DUP)

Lab Sample ID: NTRA200624-W1-B.DP1, Parent Sample ID: S15111.01

Run in Batch: NTRA200624-W1-B, Run Date: 06/24/2020 08:58, Prep Date: 06/24/2020, Matrix: Liquid, Dilution: 10

Analyte	Flags	RPD	RPD CL
Nitrate-N		<1	15

Inorganics, Prep Batch ID: PHS200625QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS200625QC.LRB1

Run in Batch: PHS200625QC, Run Date: 06/25/2020 13:29, Prep Date: 06/25/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS200625QC.LRB2

Run in Batch: PHS200625QC, Run Date: 06/25/2020 13:36, Prep Date: 06/25/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS200625QC.LCS1

Run in Batch: PHS200625QC, Run Date: 06/25/2020 13:43, Prep Date: 06/25/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		91	90	110

Matrix Spike (MS)

Lab Sample ID: PHS200625QC.MS1, Parent Sample ID: S15034.01

Run in Batch: PHS200625QC, Run Date: 06/25/2020 19:54, Prep Date: 06/25/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		96	80	120

Duplicate (DUP)

Lab Sample ID: PHS200625QC.DP1, Parent Sample ID: S15093.01

Run in Batch: PHS200625QC, Run Date: 06/25/2020 19:50, Prep Date: 06/25/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		2.4	20

Inorganics, Prep Batch ID: TKN200624QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN200624QC.LRB1

Run in Batch: TKN200624QC, Run Date: 06/24/2020 11:25, Prep Date: 06/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.02	mg/L

Blank (BLK)

Lab Sample ID: TKN200624QC.LRB2

Run in Batch: TKN200624QC, Run Date: 06/24/2020 13:49, Prep Date: 06/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN200624QC.LCS1

Run in Batch: TKN200624QC, Run Date: 06/24/2020 14:11, Prep Date: 06/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		105	90	110

Matrix Spike (MS)

Lab Sample ID: TKN200624QC.MS1, Parent Sample ID: S15022.02

Run in Batch: TKN200624QC, Run Date: 06/24/2020 14:42, Prep Date: 06/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		97	80	120

Matrix Spike (MS)

Lab Sample ID: TKN200624QC.MS2, Parent Sample ID: S15149.03

Run in Batch: TKN200624QC, Run Date: 06/24/2020 21:29, Prep Date: 06/24/2020, Matrix: Solid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		101	80	120

Duplicate (DUP)

Lab Sample ID: TKN200624QC.DP1, Parent Sample ID: S15066.01

Run in Batch: TKN200624QC, Run Date: 06/24/2020 17:11, Prep Date: 06/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		5.5	20

Duplicate (DUP)

Lab Sample ID: TKN200624QC.DP2, Parent Sample ID: S15149.03

Run in Batch: TKN200624QC, Run Date: 06/24/2020 21:24, Prep Date: 06/24/2020, Matrix: Solid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		1.0	20

Organics - Volatiles, Prep Batch ID: VS200625W1

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

Blank (BLK)

Lab Sample ID: 200625A9.BLKW25A

Run in Batch: 200625A9, Run Date: 06/25/2020 10:44, Prep Date: 06/25/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200625A9.LCSW25A

Run in Batch: 200625A9, Run Date: 06/25/2020 09:40, Prep Date: 06/25/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		93.3	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200625A9.LCSDW25A, Parent Sample ID: 200625A9.LCSW25A

Run in Batch: 200625A9, Run Date: 06/25/2020 10:02, Prep Date: 06/25/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.8	70.0	130.0	1.6	30.0

Organics - Volatiles, Prep Batch ID: VS200701W1

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

Blank (BLK)

Lab Sample ID: 200701B9.BLKW01A

Run in Batch: 200701B9, Run Date: 07/01/2020 12:47, Prep Date: 07/01/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200701B9.LCSW01A

Run in Batch: 200701B9, Run Date: 07/01/2020 11:23, Prep Date: 07/01/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		100.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200701B9.LCSDW01A, Parent Sample ID: 200701B9.LCSW01A

Run in Batch: 200701B9, Run Date: 07/01/2020 11:44, Prep Date: 07/01/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		90.6	70.0	130.0	10.1	30.0

Merit Laboratories, Inc.
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Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Trevor Swarthout
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive Ste 500
CITY: Novi | STATE: MI | ZIP CODE: 48390
PHONE NO.: 248-994-2240 | FAX NO.:
E-MAIL ADDRESS: trevor.swarthout@arcadis.com
P.O. NO.: 30042872.04700
QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700/RACER Lansing Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Marina K Samp / Marina Samp
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO3	H2SO4	NaOH	MeOH	OTHER	1,4 Dioxane	Nitrate	TKN, TP	Special Instructions
15102.01	6/23/2020	1150	TW-14-06_062320	GW	5	1	3		1				✓	✓	✓	Send results to
.02	6/23/2020	1400	TW-15-11_062320	GW	3		3						✓			trevor.swarthout@
																arcadis.com &
																marina.samp@
																arcadis.com

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Marina K Samp / Arcadis — DATE: 06/23/2020 — TIME: 1540
RECEIVED BY: SIGNATURE/ORGANIZATION: Sam Smith — DATE: 6/23/20 — TIME: 1540
RELINQUISHED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:

SEAL NO. — SEAL INTACT YES☐ NO☐ — INITIALS:
SEAL NO. — SEAL INTACT YES☐ NO☐ — INITIALS:

NOTES: TEMP ON ARRIVAL: 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.17

Analytical Laboratory Report

Revised Report

Report ID: S14456.01(02)
Generated on 07/07/2020
Replaces report S14456.01(01) generated on 06/11/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14456.01-S14456.08
Project: 30042872 / RACER Lansing - Plant 6
Collected Date(s): 06/02/2020
Submitted Date/Time: 06/03/2020 08:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Samples .06-.08 tags updated per client request

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
N/A	Not Applicable
SW3015A	SW 846 Method 3015A Revision 1 February 2007
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Sample Summary (8 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14456.01	EB-04_060220	Liquid	06/02/20 11:00
S14456.02	MWBP-12-UST1-4_060220	Groundwater	06/02/20 13:10
S14456.03	FB-03_060220	Liquid	06/02/20 13:15
S14456.04	MWBP-11-UST1-4_060220	Groundwater	06/02/20 14:05
S14456.05	MW-14-66_060220	Groundwater	06/02/20 15:20
S14456.06	MW-04-01(6)_060220	Groundwater	06/02/20 13:30
S14456.07	MW-03-06_060220	Groundwater	06/02/20 15:10
S14456.08	Trip Blank_060220	Liquid	06/02/20 00:01

Lab Sample ID: S14456.01
Sample Tag: EB-04_060220
Collected Date/Time: 06/02/2020 11:00
Matrix: Liquid
COC Reference: 124704

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 11:46, Analyst: JGH

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

Lab Sample ID: S14456.01 (continued)
Sample Tag: EB-04_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 11:46, Analyst: JGH (continued)

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

Lab Sample ID: S14456.02
Sample Tag: MWBP-12-UST1-4_060220
Collected Date/Time: 06/02/2020 13:10
Matrix: Groundwater
COC Reference: 124704

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR
1	1L Amber	None	Yes	4.7	IR
1	125ml Plastic	HNO3	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	
Metal Digestion	Completed	SW3015A	06/08/20 12:00	CCM	
BNA Extraction	Completed	SW3510C	06/03/20 12:30	JL	

Metals

Method: E200.8, Run Date: 06/08/20 13:04, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	0.010	0.002		mg/L	5	7440-38-2	
Chromium	0.006	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	Not detected	0.005		mg/L	5	7440-02-0	
Vanadium	0.010	0.005		mg/L	5	7440-62-2	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/03/20 22:07, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	

Lab Sample ID: S14456.02 (continued)
Sample Tag: MWBP-12-UST1-4_060220

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/03/20 22:07, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 13:06, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	

Lab Sample ID: S14456.02 (continued)
Sample Tag: MWBP-12-UST1-4_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 13:06, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	1	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	

Lab Sample ID: S14456.02 (continued)
Sample Tag: MWBP-12-UST1-4_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 13:06, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14456.03
Sample Tag: FB-03_060220
Collected Date/Time: 06/02/2020 13:15
Matrix: Liquid
COC Reference: 124704

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 12:06, Analyst: JGH

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

Lab Sample ID: S14456.03 (continued)
Sample Tag: FB-03_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 12:06, Analyst: JGH (continued)

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

Lab Sample ID: S14456.04
Sample Tag: MWBP-11-UST1-4_060220
Collected Date/Time: 06/02/2020 14:05
Matrix: Groundwater
COC Reference: 124704

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR
1	125ml Plastic	HNO3	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	
Metal Digestion	Completed	SW3015A	06/08/20 12:00	CCM	

Metals

Method: E200.8, Run Date: 06/08/20 13:07, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	0.012	0.002		mg/L	5	7440-38-2	
Chromium	Not detected	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	Not detected	0.005		mg/L	5	7440-02-0	
Vanadium	Not detected	0.005		mg/L	5	7440-62-2	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 19:18, Analyst: JGH

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

Lab Sample ID: S14456.04 (continued)
Sample Tag: MWBP-11-UST1-4_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 19:18, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	1	1		ug/L	1	100-41-4	
p,m-Xylene*	3	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14456.05
Sample Tag: MW-14-66_060220
Collected Date/Time: 06/02/2020 15:20
Matrix: Groundwater
COC Reference: 124704

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/08/20 12:00	CCM	

Metals

Method: E200.8, Run Date: 06/08/20 13:08, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	0.004	0.002		mg/L	5	7440-38-2	
Chromium	Not detected	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	Not detected	0.005		mg/L	5	7440-02-0	
Vanadium	Not detected	0.005		mg/L	5	7440-62-2	

Lab Sample ID: S14456.06
Sample Tag: MW-04-01(6)_060220
Collected Date/Time: 06/02/2020 13:30
Matrix: Groundwater
COC Reference: 124704

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 12:47, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14456.07
Sample Tag: MW-03-06_060220
Collected Date/Time: 06/02/2020 15:10
Matrix: Groundwater
COC Reference: 124704

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 13:10, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	5	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 19:57, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	12	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S14456.07 (continued)
Sample Tag: MW-03-06_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 19:57, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14456.08
Sample Tag: Trip Blank_060220
Collected Date/Time: 06/02/2020 00:01
Matrix: Liquid
COC Reference: 124704

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 12:25, Analyst: JGH

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

Lab Sample ID: S14456.08 (continued)
Sample Tag: Trip Blank_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 12:25, Analyst: JGH (continued)

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

Merit Laboratories Login Checklist

Lab Set ID: S14456
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / RACER Lansing - Plant 6
Submitted: 06/03/2020 08:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.7
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S14456 Submitted: 06/03/2020 08:15

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30042872 / RACER Lansing - Plant 6

Initial Preservation Check: 06/03/2020 08:50 MMC

Preservation Recheck (E200.8): N/A

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Lab ID	125 ml Plastic HNO_3	250 ml Plastic HNO_3	1 L Plastic HNO_3	250 ml Plastic H_2SO_4	125 ml Amber H_2SO_4	32 oz Glass HCl	125 ml Plastic NaOH	125 ml Amber $PbCO_3$ NaOH	pH					Notes
									<2	>12	other	ml add	new pH	
S14456.02	X								X					
S14456.04	X								X					
S14456.05	X								X					

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

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CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 994 2240 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Michael.spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / Racer Lansing - Plant 6
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake P. Sarchewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	SM5030C/8260C VOC's	8260B SIM 1,4-Dioxane	SM3030B/6020B metals*	SM8270D SVOC's	Special Instructions
144561.01	6.2.20	1100	EB-04_060220	L	3		3						X				* Select metals -
.02	6.2.20	1310	MWBP-12-UST1-4_060220	GW	5	1	3	1						X	X	X	As, Ni, Pb, V, Cr, Cu
.03	6.2.20	1315	EB-03_060220	L	3		3						X				
.04	6.2.20	1405	MWBP-11-UST1-4_060220	GW	4		3	1						X	X		
.05	6.2.20	1520	MW-14-606_060220	GW	1			1							X		
.06	6.2.20	1330	MW-04-01(16)	GW	3		3							X			
.07	6.2.20	1510	MW-03-06	GW	3		3						X	X			
.08	6/2/20	—	Trip Blank	GW	1								X				

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 6.2.20	TIME	
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 6/2/20	TIME 16:30	
RELINQUISHED BY: SIGNATURE/ORGANIZATION David Stoddard Arcadis		DATE 6/3/20	TIME 8:15	
RECEIVED BY: SIGNATURE/ORGANIZATION Merit Dropbox		DATE 6/3/20	TIME 8:15	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 6/2/2020	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Chicato	DATE 6/2/2020	TIME 0815

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5 18 12

Analytical Laboratory Report

Report ID: S14457.01(01)
Generated on 06/15/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

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John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S14457.01-S14457.03
Project: RACER Lansing
Collected Date(s): 06/02/2020
Submitted Date/Time: 06/03/2020 08:15
Sampled by: Daniel Stockard
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1
N/A	Not Applicable
SM4500-N(org)/NH	Standard Method 4500 N(org)B / NH3D 2011
SM4500-PE	Standard Method 4500 P E 2011
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14457.01	MW-14-61_060220	Groundwater	06/02/20 13:00
S14457.02	MW-15-72_060220	Groundwater	06/02/20 16:10
S14457.03	TW-15-12_060220	Groundwater	06/02/20 18:15

Lab Sample ID: S14457.01
Sample Tag: MW-14-61_060220
Collected Date/Time: 06/02/2020 13:00
Matrix: Groundwater
COC Reference: 124713

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	None	Yes	4.7	IR
1	250ml Plastic	H2SO4	Yes	4.7	IR
3	40ml Glass	HCL	Yes	4.7	IR
1	1L Amber	None	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	
BNA Extraction	Completed	SW3510C	06/05/20 17:00	JL	

Inorganics

Method: E300.0, Run Date: 06/03/20 10:34, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 06/08/20 19:20, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.8	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 06/04/20 19:32, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.05	0.01	0.009	mg/L	1	7723-14-0	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/08/20 19:25, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	

Lab Sample ID: S14457.01 (continued)
Sample Tag: MW-14-61_060220

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/08/20 19:25, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 13:32, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	152	1		ug/L	1	123-91-1	

Lab Sample ID: S14457.01 (continued)
Sample Tag: MW-14-61_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 20:16, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	17	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	

Lab Sample ID: S14457.01 (continued)
Sample Tag: MW-14-61_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 20:16, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14457.02
Sample Tag: MW-15-72_060220
Collected Date/Time: 06/02/2020 16:10
Matrix: Groundwater
COC Reference: 124713

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR
1	1L Amber	None	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	
BNA Extraction	Completed	SW3510C	06/05/20 17:00	JL	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/08/20 19:56, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	

Lab Sample ID: S14457.02 (continued)
Sample Tag: MW-15-72_060220

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/08/20 19:56, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 18:07, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	270	10		ug/L	10	123-91-1	Y

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 20:35, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S14457.02 (continued)
Sample Tag: MW-15-72_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 20:35, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	

Lab Sample ID: S14457.02 (continued)
Sample Tag: MW-15-72_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/04/20 20:35, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S14457.03
Sample Tag: TW-15-12_060220
Collected Date/Time: 06/02/2020 18:15
Matrix: Groundwater
COC Reference: 124713

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	None	Yes	4.7	IR
1	250ml Plastic	H2SO4	Yes	4.7	IR
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Inorganics

Method: E300.0, Run Date: 06/03/20 10:47, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 06/08/20 20:51, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.9	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 06/04/20 19:40, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.31	0.05	0.045	mg/L	5	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 18:29, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	210	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Merit Laboratories Login Checklist

Lab Set ID: S14457
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing
Submitted: 06/03/2020 08:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.7
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S14457 Initials: MMC

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: RACER Lansing

Submitted: 06/03/2020 08:15 Login User:

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Lab ID	125 ml Plastic HNO_3	250 ml Plastic HNO_3	1 L Plastic HNO_3	250 ml Plastic H_2SO_4	125 ml Amber H_2SO_4	32 oz Glass HCl	125 ml Plastic NaOH	125 ml Amber $PbCO_3$ NaOH	pH					Notes
									<2	>12	other	ml add	new pH	
S14457.01				X					X					
S14457.03				X					X					

Prepared by Merit Laboratories

Merit Laboratories, Inc.

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C.O.C. PAGE # 1 OF 1

124713

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil & Dan Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. #500
CITY: Novi STATE: MI ZIP CODE: 98377
PHONE NO.: FAX NO.: P.O. NO.: 30042872
E-MAIL ADDRESS: mike.spacil@arcadis.com daniel.stockard@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Daniel Stockard

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO3	H2SO4	NaOH	MeOH	OTHER	VOCs 8260C/5035QC	SVOCs SM8270D	1,4-Dioxane 8260B SIMS	Nitrate E300	TKN 4500-Norg/NH3	TP SM4500-P E
14457.01	6/1/20	13:00	MW-14-61_060220	GW	6	1	3		1				X	X	X	X	X	X
.02	6/2/20	16:10	MW-15-72-060220	GW	4	1	3						X	X	X			
.03	6/2/20	18:15	TW-15-12_060220	GW	5	1	3		1						X	X	X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Daniel Stockard ☒ Sampler DATE: 6/3/20 TIME: 8:15
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Dropbox DATE: 6/3/20 TIME: 8:15

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box DATE: 6/2/2020 TIME: 0815
RECEIVED BY: SIGNATURE/ORGANIZATION: M Chilcott DATE: 6/2/2020 TIME: 0815

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO.: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO.: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL: 4.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Analytical Laboratory Report

Revised Report

Report ID: S14507.01(02)
Generated on 07/07/2020
Replaces report S14507.01(01) generated on 06/15/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14507.01-S14507.08
Project: 30042872 / RACER Lansing - Plant 6
Collected Date(s): 06/02/2020 - 06/03/2020
Submitted Date/Time: 06/04/2020 08:15
Sampled by: Jake Pisarkiewicz / Jessica F
P.O. #: 30042872

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Samples .03 and .05-.07 tags updated per client request

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Sample Summary (8 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14507.01	MW-04-06R_060320	Groundwater	06/03/20 11:00
S14507.02	MW-04-04R_060320	Groundwater	06/03/20 12:20
S14507.03	DUP-11_060320	Groundwater	06/03/20 12:00
S14507.04	MW-03-08_060320	Groundwater	06/03/20 15:30
S14507.05	MW-02-03(6)_060320	Groundwater	06/03/20 12:35
S14507.06	MW-03-05_060320	Groundwater	06/03/20 10:25
S14507.07	Trip Blank_060320	Water	06/03/20 00:01
S14507.08	FB-04_060220	Water	06/02/20 00:01

Lab Sample ID: S14507.01
Sample Tag: MW-04-06R_060320
Collected Date/Time: 06/03/2020 11:00
Matrix: Groundwater
COC Reference: 124705

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 12:56, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14507.02
Sample Tag: MW-04-04R_060320
Collected Date/Time: 06/03/2020 12:20
Matrix: Groundwater
COC Reference: 124705

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 15:01, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14507.03
Sample Tag: DUP-11_060320
Collected Date/Time: 06/03/2020 12:00
Matrix: Groundwater
COC Reference: 124705

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 15:23, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14507.04
Sample Tag: MW-03-08_060320
Collected Date/Time: 06/03/2020 15:30
Matrix: Groundwater
COC Reference: 124705

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 05:18, Analyst: JGH

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

Lab Sample ID: S14507.04 (continued)
Sample Tag: MW-03-08_060320

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 05:18, Analyst: JGH (continued)

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

Lab Sample ID: S14507.05
Sample Tag: MW-02-03(6)_060320
Collected Date/Time: 06/03/2020 12:35
Matrix: Groundwater
COC Reference: 124705

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR
1	1L Amber	None	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	
BNA Extraction	Completed	SW3510C	06/08/20 11:00	JL	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/10/20 19:58, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	

Lab Sample ID: S14507.05 (continued)
Sample Tag: MW-02-03(6)_060320

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/10/20 19:58, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 15:45, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	15	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 05:37, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	

Lab Sample ID: S14507.05 (continued)
Sample Tag: MW-02-03(6)_060320

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 05:37, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	

Lab Sample ID: S14507.05 (continued)

Sample Tag: MW-02-03(6)_060320

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 05:37, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14507.06
Sample Tag: MW-03-05_060320
Collected Date/Time: 06/03/2020 10:25
Matrix: Groundwater
COC Reference: 124705

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 16:07, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 05:56, Analyst: JGH

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

Lab Sample ID: S14507.06 (continued)
Sample Tag: MW-03-05_060320

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 05:56, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14507.07
Sample Tag: Trip Blank_060320
Collected Date/Time: 06/03/2020 00:01
Matrix: Water
COC Reference: 124705

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 00:08, Analyst: JGH

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

Lab Sample ID: S14507.07 (continued)

Sample Tag: Trip Blank_060320

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 00:08, Analyst: JGH (continued)

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

Lab Sample ID: S14507.08
Sample Tag: FB-04_060220
Collected Date/Time: 06/02/2020 00:01
Matrix: Water
COC Reference: 124705

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 00:27, Analyst: JGH

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

Lab Sample ID: S14507.08 (continued)
Sample Tag: FB-04_060220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 00:27, Analyst: JGH (continued)

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

Merit Laboratories Login Checklist

Lab Set ID: S14507
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / RACER Lansing - Plant 6
Submitted: 06/04/2020 08:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

* Plant 6

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124705

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot dr
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 248 994 2240 | FAX NO. | P.O. NO
E-MAIL ADDRESS | QUOTE NO

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 30042872 / Racer Lansing - Plant 6
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz / Jessica F

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B SIMS	VOCs SM8260C/8260D	SVOCs SM8270D								
14507.01	6-3-20	1100	MW-04-D16R_060320	GW	3		3						X										
.02	6-3-20	1220	MW-04-04R_060320	GW	3		3						X										
.03	6-3-20	PM	Dup-11	GW	3		3						X										
.04	6-3-20	1530	MW-03-08_060320	GW	3		3						[illegible]	X									
.05	6-3-20	1230	MW-02-03(6)	GW	4	1	3						X	X	X								
.06	6-3-20	1225	MW-03-05	GW	3		3						X	X									
.07	6-3-2	AM	Trip Blank	L	1		1							X									
.08	6-3-20	PM	FB-04_060320	L	3		3							X									

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	☒ Sampler	6-3-20	
RECEIVED BY: SIGNATURE/ORGANIZATION		6/3/20	16:50
RELINQUISHED BY: SIGNATURE/ORGANIZATION		6/3/20	18:25
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	6/3/20	18:25

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE	TIME
		6/4/2020	0815
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
		6/4/2020	0815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Revised Report

Report ID: S14508.01(02)
Generated on 07/07/2020
Replaces report S14508.01(01) generated on 06/15/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14508.01-S14508.07
Project: RACER Lansing
Collected Date(s): 06/03/2020
Submitted Date/Time: 06/04/2020 08:15
Sampled by: Daniel Stockard
P.O. #: 30042872

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Sample Summary (Page 5)

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Samples ..03 and .07 tags updated per client request

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14508.01	PW-14-02_060320	Groundwater	06/03/20 10:35
S14508.02	MW-19-115_060320	Groundwater	06/03/20 12:30
S14508.03	DUP-04_060320	Groundwater	06/03/20 00:01
S14508.04	MW-19-116_060320	Groundwater	06/03/20 14:05
S14508.05	MW-19-117_060320	Groundwater	06/03/20 15:40
S14508.06	MW-17-86_060320	Groundwater	06/03/20 17:45
S14508.07	Trip Blank_060320	Water	06/03/20 00:01

Lab Sample ID: S14508.01
Sample Tag: PW-14-02_060320
Collected Date/Time: 06/03/2020 10:35
Matrix: Groundwater
COC Reference: 124709

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 16:29, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	160	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 06:16, Analyst: JGH

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

Lab Sample ID: S14508.01 (continued)
Sample Tag: PW-14-02_060320

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 06:16, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14508.02
Sample Tag: MW-19-115_060320
Collected Date/Time: 06/03/2020 12:30
Matrix: Groundwater
COC Reference: 124709

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 16:51, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	13	1		ug/L	1	123-91-1	

Lab Sample ID: S14508.03
Sample Tag: DUP-04_060320
Collected Date/Time: 06/03/2020 00:01
Matrix: Groundwater
COC Reference: 124709

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 17:14, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	160	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 06:35, Analyst: JGH

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

Lab Sample ID: S14508.03 (continued)
Sample Tag: DUP-04_060320

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 06:35, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14508.04
Sample Tag: MW-19-116_060320
Collected Date/Time: 06/03/2020 14:05
Matrix: Groundwater
COC Reference: 124709

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 17:36, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	61	1		ug/L	1	123-91-1	

Lab Sample ID: S14508.05
Sample Tag: MW-19-117_060320
Collected Date/Time: 06/03/2020 15:40
Matrix: Groundwater
COC Reference: 124709

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 13:40, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S14508.06
Sample Tag: MW-17-86_060320
Collected Date/Time: 06/03/2020 17:45
Matrix: Groundwater
COC Reference: 124709

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/05/20 10:20	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 18:20, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	94	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 06:55, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	19	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S14508.06 (continued)
Sample Tag: MW-17-86_060320

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 06:55, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14508.07
Sample Tag: Trip Blank_060320
Collected Date/Time: 06/03/2020 00:01
Matrix: Water
COC Reference: 124709

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/09/20 10:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 23:05, Analyst: JGH

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

Lab Sample ID: S14508.07 (continued)
Sample Tag: Trip Blank_060320

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/05/20 23:05, Analyst: JGH (continued)

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

Merit Laboratories Login Checklist

Lab Set ID: S14508
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing
Submitted: 06/04/2020 08:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124709

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil Daniel Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: FAX NO.: P.O. NO:
E-MAIL ADDRESS: mike.spacil@arcadis.com daniel.stockard@arcadis.com QUOTE NO:

PROJECT NO./NAME: RACER Lansing
SAMPLER(S) PLEASE PRINT/SIGN NAME: Daniel Stockard

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO3	H2SO4	NaOH	MeOH	OTHER	VOCs SM5030C 8260C	1,4-Dioxane 8260B SIM
14508 .01	6/3/20	10:35	PW-14-02-060320	GW	3		3						X	X
.02	6/3/20	12:30	MW-19-115-060320	GW	3		3							X
.03	6/3/20		DUP-04	GW	3		3						X	X
.04	6/3/20	14:05	MW-19-116-060320	GW	3		3							X
.05	6/3/20	15:40	MW-19-117-060320	GW	3									X
.06	6/3/20	17:45	MW-17-86-060320	GW	3								X	X
.07	6/3/20		Trip Blank		1								X	

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Daniel Stockard ☒ Sampler	DATE: 6/3/20	TIME: 18:25	
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Dropbox	DATE: 6/3/20	TIME: 18:25	
RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box	DATE: 6/4/2020	TIME: 0815	
RECEIVED BY: SIGNATURE/ORGANIZATION: M Chilcott	DATE: 6/4/2020	TIME: 0815	
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL: 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Analytical Laboratory Report

Report ID: S14576.01(01)
Generated on 06/15/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14576.01-S14576.10
Project: 30042872 / RACER - Lansing Plant 6
Collected Date(s): 06/04/2020
Submitted Date/Time: 06/05/2020 08:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
N/A	Not Applicable
SW3015A	SW 846 Method 3015A Revision 1 February 2007
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Analytical Laboratory Report

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14576.01	Trip Blank	Water	06/04/20 00:01
S14576.02	MW-12-13_060420	Groundwater	06/04/20 09:25
S14576.03	Dup-10	Groundwater	06/04/20 00:01
S14576.04	MW-14-67_060420	Groundwater	06/04/20 10:35
S14576.05	MW-13-36R_060420	Groundwater	06/04/20 11:30
S14576.06	P6-SB-07_060420	Groundwater	06/04/20 14:30
S14576.07	MW-13-52_060420	Groundwater	06/04/20 11:05
S14576.08	MW-13-50_060420	Groundwater	06/04/20 13:35
S14576.09	MW-13-53_060420	Groundwater	06/04/20 15:05
S14576.10	MWBP-10-UST5-6_060420	Groundwater	06/04/20 16:00

Lab Sample ID: S14576.01
Sample Tag: Trip Blank
Collected Date/Time: 06/04/2020 00:01
Matrix: Water
COC Reference: 124706

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/09/20 10:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 12:26, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 09:43, Analyst: JGH

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

Lab Sample ID: S14576.01 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 09:43, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14576.02
Sample Tag: MW-12-13_060420
Collected Date/Time: 06/04/2020 09:25
Matrix: Groundwater
COC Reference: 124706

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/08/20 12:00	CCM	

Metals

Method: E200.8, Run Date: 06/08/20 13:10, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	Not detected	0.002		mg/L	5	7440-38-2	
Chromium	Not detected	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	0.008	0.005		mg/L	5	7440-02-0	
Vanadium	Not detected	0.005		mg/L	5	7440-62-2	

Lab Sample ID: S14576.03
Sample Tag: Dup-10
Collected Date/Time: 06/04/2020 00:01
Matrix: Groundwater
COC Reference: 124706

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/08/20 12:00	CCM	

Metals

Method: E200.8, Run Date: 06/08/20 13:12, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	Not detected	0.002		mg/L	5	7440-38-2	
Chromium	Not detected	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	0.007	0.005		mg/L	5	7440-02-0	
Vanadium	Not detected	0.005		mg/L	5	7440-62-2	

Lab Sample ID: S14576.04
Sample Tag: MW-14-67_060420
Collected Date/Time: 06/04/2020 10:35
Matrix: Groundwater
COC Reference: 124706

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/08/20 12:00	CCM	

Metals

Method: E200.8, Run Date: 06/08/20 13:13, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	Not detected	0.002		mg/L	5	7440-38-2	
Chromium	Not detected	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	Not detected	0.005		mg/L	5	7440-02-0	
Vanadium	Not detected	0.005		mg/L	5	7440-62-2	

Lab Sample ID: S14576.05
Sample Tag: MW-13-36R_060420
Collected Date/Time: 06/04/2020 11:30
Matrix: Groundwater
COC Reference: 124706

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/08/20 12:00	CCM	

Metals

Method: E200.8, Run Date: 06/08/20 13:15, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	Not detected	0.002		mg/L	5	7440-38-2	
Chromium	Not detected	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	Not detected	0.005		mg/L	5	7440-02-0	
Vanadium	0.005	0.005		mg/L	5	7440-62-2	

Lab Sample ID: S14576.06
Sample Tag: P6-SB-07_060420
Collected Date/Time: 06/04/2020 14:30
Matrix: Groundwater
COC Reference: 124706

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	1L Amber	None	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
BNA Extraction	Completed	SW3510C	06/08/20 11:00	JL	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/10/20 20:59, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	

Lab Sample ID: S14576.06 (continued)
Sample Tag: P6-SB-07_060420

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/10/20 20:59, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Lab Sample ID: S14576.07
Sample Tag: MW-13-52_060420
Collected Date/Time: 06/04/2020 11:05
Matrix: Groundwater
COC Reference: 124706

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 14:03, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14576.08
Sample Tag: MW-13-50_060420
Collected Date/Time: 06/04/2020 13:35
Matrix: Groundwater
COC Reference: 124706

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 19:05, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14576.09
Sample Tag: MW-13-53_060420
Collected Date/Time: 06/04/2020 15:05
Matrix: Groundwater
COC Reference: 124706

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 19:26, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14576.10
Sample Tag: MWBP-10-UST5-6_060420
Collected Date/Time: 06/04/2020 16:00
Matrix: Groundwater
COC Reference: 124706

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.0	IR
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/09/20 10:00	JML	
Metal Digestion	Completed	SW3015A	06/08/20 12:00	CCM	

Metals

Method: E200.8, Run Date: 06/08/20 13:17, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	0.012	0.002		mg/L	5	7440-38-2	
Chromium	Not detected	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	Not detected	0.005		mg/L	5	7440-02-0	
Vanadium	Not detected	0.005		mg/L	5	7440-62-2	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 10:03, Analyst: JGH

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

Lab Sample ID: S14576.10 (continued)
Sample Tag: MWBP-10-UST5-6_060420

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 10:03, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Merit Laboratories Login Checklist

Lab Set ID: S14576
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / RACER - Lansing Plant 6
Submitted: 06/05/2020 08:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S14576 Initials: MMC

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30042872 / RACER - Lansing Plant 6

Submitted: 06/05/2020 08:15 Login User:

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Lab ID	125 ml Plastic HNO_3	250 ml Plastic HNO_3	1 L Plastic HNO_3	250 ml Plastic H_2SO_4	125 ml Amber H_2SO_4	32 oz Glass HCl	125 ml Plastic NaOH	125 ml Amber $PbCO_3$ NaOH	pH					Notes
									<2	>12	other	ml add	new pH	
S14576.02	X								X					
S14576.03	X								X					
S14576.04	X								X					
S14576.05	X								X					
S14576.10	X								X					

Prepared by Merit Laboratories

Plant 6

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124706

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 994 2240 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Michael.spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / Racer-Lansing Plant 6
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Metals # SM6020A/SM7471B	VOCs SM5030C/8260C	1,4-Dioxane 8260B SIM	SVOCs SM8270B	Special Instructions
14576 .01	6.4.20	AM	Trip Blank	L	1		1							X	X		* Select metals -
.02	6.4.20	0925	MW-12-13_060420	GW	1			1					X				As, Ni, Pb, V, Cr, Cu
.03	6.4.20	AM	Dup-10	GW	1			1					X				
.04	6.4.20	1035	MW-14-67_060420	GW	1			1					X				
.05	6.4.20	1130	MW-13-36R_060420	GW	1			1					X				
.06	6.4.20	1430	P6-SB-07_060420	GW	1	1										X	
.07	6.4.20	1105	MW-13-52_060420	GW	3		3								X		
.08	6.4.20	1335	MW-13-50_060420	GW	3		3								X		
.09	6.4.20	1505	MW-13-53_060420	GW	3										X		
.10	6.4.20	1600	MW-BP-10-45T5-6_060420	GW	3		3						X	X	X		

	SIGNATURE/ORGANIZATION	DATE	TIME
RELINQUISHED BY:	Sampler	6.4.20	
RECEIVED BY:		6/4/20	16:50
RELINQUISHED BY:		6/4/20	17:47
RECEIVED BY:	Merit Dropbox		

	SIGNATURE/ORGANIZATION	DATE	TIME
RELINQUISHED BY:	Merit Drop Box	6/5/2020	0815
RECEIVED BY:		6/5/2020	0815

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Analytical Laboratory Report

Report ID: S14578.01(01)
Generated on 06/16/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

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Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S14578.01-S14578.09
Project: Monitoring
Collected Date(s): 06/04/2020
Submitted Date/Time: 06/05/2020 08:15
Sampled by: Unknown
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1
N/A	Not Applicable
SM4500-N(org)/NH	Standard Method 4500 N(org)B / NH3D 2011
SM4500-PE	Standard Method 4500 P E 2011
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (9 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14578.01	MW-16-84_060420	Groundwater	06/04/20 10:50
S14578.02	MW-19-120_060420	Groundwater	06/04/20 12:40
S14578.03	DUP-03	Groundwater	06/04/20 00:01
S14578.04	MW-19-121_060420	Groundwater	06/04/20 14:05
S14578.05	TW-14-02_060420	Groundwater	06/04/20 15:30
S14578.06	MW-19-123_060420	Groundwater	06/04/20 16:45
S14578.07	FB-02_060420	Water	06/04/20 16:20
S14578.08	EB-03_060420	Water	06/04/20 17:10
S14578.09	Trip Blank	Water	06/04/20 00:01

Lab Sample ID: S14578.01
Sample Tag: MW-16-84_060420
Collected Date/Time: 06/04/2020 10:50
Matrix: Groundwater
COC Reference: 124712

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/09/20 10:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 19:49, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	58	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/09/20 13:03, Analyst: JGH

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

Lab Sample ID: S14578.01 (continued)
Sample Tag: MW-16-84_060420

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/09/20 13:03, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14578.02
Sample Tag: MW-19-120_060420
Collected Date/Time: 06/04/2020 12:40
Matrix: Groundwater
COC Reference: 124712

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/09/20 10:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 20:11, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	184	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 14:33, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	40	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	

Lab Sample ID: S14578.02 (continued)
Sample Tag: MW-19-120_060420

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 14:33, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14578.03
Sample Tag: DUP-03
Collected Date/Time: 06/04/2020 00:01
Matrix: Groundwater
COC Reference: 124712

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/09/20 10:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 14:31, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	58	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 14:53, Analyst: JGH

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

Lab Sample ID: S14578.03 (continued)
Sample Tag: DUP-03

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 14:53, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14578.04
Sample Tag: MW-19-121_060420
Collected Date/Time: 06/04/2020 14:05
Matrix: Groundwater
COC Reference: 124712

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR
1	250ml Plastic	H2SO4	Yes	3.0	IR
1	125ml Plastic	None	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Inorganics

Method: E300.0, Run Date: 06/05/20 12:04, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 06/08/20 20:26, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.8	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 06/10/20 14:37, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.14	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 23:47, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	115	1		ug/L	1	123-91-1	

Lab Sample ID: S14578.05
Sample Tag: TW-14-02_060420
Collected Date/Time: 06/04/2020 15:30
Matrix: Groundwater
COC Reference: 124712

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/09/20 10:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 18:51, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	410	10		ug/L	10	123-91-1	Y

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 15:12, Analyst: JGH

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

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S14578.05 (continued)
Sample Tag: TW-14-02_060420

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 15:12, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S14578.06
Sample Tag: MW-19-123_060420
Collected Date/Time: 06/04/2020 16:45
Matrix: Groundwater
COC Reference: 124712

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 14:53, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	75	1		ug/L	1	123-91-1	

Lab Sample ID: S14578.07
Sample Tag: FB-02_060420
Collected Date/Time: 06/04/2020 16:20
Matrix: Water
COC Reference: 124712

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/09/20 10:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 23:02, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 10:22, Analyst: JGH

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

Lab Sample ID: S14578.07 (continued)
Sample Tag: FB-02_060420

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 10:22, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14578.08
Sample Tag: EB-03_060420
Collected Date/Time: 06/04/2020 17:10
Matrix: Water
COC Reference: 124712

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/09/20 10:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/10/20 23:24, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 10:41, Analyst: JGH

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

Lab Sample ID: S14578.08 (continued)
Sample Tag: EB-03_060420

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 10:41, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14578.09
Sample Tag: Trip Blank
Collected Date/Time: 06/04/2020 00:01
Matrix: Water
COC Reference: 124712

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/09/20 10:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 11:01, Analyst: JGH

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

Lab Sample ID: S14578.09 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/06/20 11:01, Analyst: JGH (continued)

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

Merit Laboratories Login Checklist

Lab Set ID:S14578
Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: Monitoring
Submitted:06/05/2020 08:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[ ] Yes	[X] No	[ ] N/A	COC adequately filled out	Trip Blank not listed on COC
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S14578 Initials: MMC

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: Monitoring

Submitted: 06/05/2020 08:15 Login User:

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Lab ID	125 ml Plastic HNO_3	250 ml Plastic HNO_3	1 L Plastic HNO_3	250 ml Plastic H_2SO_4	125 ml Amber H_2SO_4	32 oz Glass HCl	125 ml Plastic NaOH	125 ml Amber $PbCO_3$ NaOH	pH					Notes
									<2	>12	other	ml add	new pH	
S14578.04				X					X					

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124712

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil Daniel Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO. FAX NO. P.O. NO.
E-MAIL ADDRESS: Mike.Spacil@arcadis.com daniel.stockard@arcadis.com QUOTE NO.

INVOICE TO

CONTACT NAME X SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME
SAMPLER(S) - PLEASE PRINT/SIGN NAME

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs 8260C	1,4-Dioxane 8260B SIM	Nitrate E300	TKN 351.2 Nitrog/NH_3	TP SM4500-PE	Special Instructions
14578.01	6/4/20	10:50	MW-16-84-060420	GW	3		3						X	X				
.02	6/4/20	12:40	MW-19-120-060420	GW	3		3						X	X				
.03	6/4/20		DUP-03	GW	3		3						X	X				
.04	6/4/20	14:05	MW-19-121-060420	GW	5	1	3		1				X	X	X	X	X	No VOCs
.05	6/4/20	15:30	TW-19-02-060420	GW	3		3						X	X				
.06	6/4/20	16:45	MW-19-123-060420	GW	3		3							X				
.07	6/4/20	16:20	FB-02-060420	GW	3		3						X	X				
.08	6/4/20	17:10	EB-03-060420	GW	3		3						X	X				
.09																		

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Daniel Stockard / Sampler	6/4/20	17:37	Merit Drop Box	6/5/2020 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	6/4/20	17:47	M Chilcoat	6/5/2020 0815
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME		
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME		

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES TEMP. ON ARRIVAL 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Analytical Laboratory Report

Revised Report

Report ID: S14611.01(03)
Generated on 07/07/2020
Replaces report S14611.01(02) generated on 06/29/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14611.01-S14611.05
Project: Monitoring
Collected Date(s): 06/05/2020
Submitted Date/Time: 06/05/2020 16:35
Sampled by: Unknown
P.O. #: 30042872

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Sample Summary (Page 5)

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Sample .05 tag updated per client request

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (5 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14611.01	MW-19-124_060520	Groundwater	06/05/20 12:05
S14611.02	MW-16-74_060520	Groundwater	06/05/20 13:40
S14611.03	MW-16-81_060520	Groundwater	06/05/20 14:45
S14611.04	MW-19-122_060520	Groundwater	06/05/20 15:50
S14611.05	DUP-02_060520	Groundwater	06/05/20 00:01

Lab Sample ID: S14611.01
Sample Tag: MW-19-124_060520
Collected Date/Time: 06/05/2020 12:05
Matrix: Groundwater
COC Reference: 124711

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 00:53, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	197	1		ug/L	1	123-91-1	

Lab Sample ID: S14611.02
Sample Tag: MW-16-74_060520
Collected Date/Time: 06/05/2020 13:40
Matrix: Groundwater
COC Reference: 124711

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/16/20 15:13, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S14611.03
Sample Tag: MW-16-81_060520
Collected Date/Time: 06/05/2020 14:45
Matrix: Groundwater
COC Reference: 124711

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/10/20 10:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 19:13, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3,100	100		ug/L	100	123-91-1	Y

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 14:27, Analyst: JGH

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

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S14611.03 (continued)
Sample Tag: MW-16-81_060520

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 14:27, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14611.04
Sample Tag: MW-19-122_060520
Collected Date/Time: 06/05/2020 15:50
Matrix: Groundwater
COC Reference: 124711

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 01:37, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	42	1		ug/L	1	123-91-1	

Lab Sample ID: S14611.05
Sample Tag: DUP-02_060520
Collected Date/Time: 06/05/2020 00:01
Matrix: Groundwater
COC Reference: 124711

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 19:35, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2,700	100		ug/L	100	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Merit Laboratories Login Checklist

Lab Set ID:S14611
Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: Monitoring
Submitted:06/05/2020 16:35 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.8
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124711

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil Daniel Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Mike.spacil@arcadis.com daniel.stockard@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME:
SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

1,4-Dioxane 8260B SIM

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B SIM
14611.01	6/5/20	12:05	MW-19-124-060520	GW	3		3						X
.02	6/5/20	13:40	MW-16-74-060520	GW	3		3						X
.03	6/5/20	19:45	MW-16-81-060520	GW	3		3						X
.04	6/5/20	15:50	MW-19-122-060520	GW	3		3						X
.05	6/5/20		DUP-02	GW	3		3						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Daniel Stockard ☒ Sampler DATE: 6/5/20 TIME: 16:35
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Dropbox DATE: 6/5/20 TIME: 16:35
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box DATE: 6/5/2020 TIME: 1635
RECEIVED BY: SIGNATURE/ORGANIZATION: M Chilcote DATE: 6/5/2020 TIME: 1635

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES:
TEMP. ON ARRIVAL: 5.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18.12

Analytical Laboratory Report

Report ID: S14650.01(01)
Generated on 06/16/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14650.01-S14650.09
Project: Monitoring
Collected Date(s): 06/08/2020
Submitted Date/Time: 06/09/2020 08:15
Sampled by: Unknown
P.O. #: 30042872

Table of Contents

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Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (9 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14650.01	MW-14-63_060820	Groundwater	06/08/20 09:15
S14650.02	MW-16-80_060820	Groundwater	06/08/20 10:40
S14650.03	MW-15-73_060820	Groundwater	06/08/20 12:15
S14650.04	MW-12-18_060820	Groundwater	06/08/20 11:35
S14650.05	MW-12-09_060820	Groundwater	06/08/20 13:00
S14650.06	MW-16-83_060820	Groundwater	06/08/20 13:40
S14650.07	MW-13-51_060820	Groundwater	06/08/20 15:20
S14650.08	MW-14-56_060820	Groundwater	06/08/20 15:15
S14650.09	Trip Blank_060820	Water	06/08/20 00:01

Analytical Laboratory Report

Lab Sample ID: S14650.01
Sample Tag: MW-14-63_060820
Collected Date/Time: 06/08/2020 09:15
Matrix: Groundwater
COC Reference: 128278

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 15:38, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S14650.02
Sample Tag: MW-16-80_060820
Collected Date/Time: 06/08/2020 10:40
Matrix: Groundwater
COC Reference: 128278

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 16:00, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	7	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S14650.03
Sample Tag: MW-15-73_060820
Collected Date/Time: 06/08/2020 12:15
Matrix: Groundwater
COC Reference: 128278

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 21:32, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	10	1		ug/L	1	123-91-1	

Lab Sample ID: S14650.04
Sample Tag: MW-12-18_060820
Collected Date/Time: 06/08/2020 11:35
Matrix: Groundwater
COC Reference: 128278

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 08:05, Analyst: JGH

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

Lab Sample ID: S14650.04 (continued)
Sample Tag: MW-12-18_060820

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 08:05, Analyst: JGH (continued)

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

Lab Sample ID: S14650.05
Sample Tag: MW-12-09_060820
Collected Date/Time: 06/08/2020 13:00
Matrix: Groundwater
COC Reference: 128278

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 16:22, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 08:24, Analyst: JGH

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

Lab Sample ID: S14650.05 (continued)
Sample Tag: MW-12-09_060820

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 08:24, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S14650.06
Sample Tag: MW-16-83_060820
Collected Date/Time: 06/08/2020 13:40
Matrix: Groundwater
COC Reference: 128278

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 16:44, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S14650.07
Sample Tag: MW-13-51_060820
Collected Date/Time: 06/08/2020 15:20
Matrix: Groundwater
COC Reference: 128278

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 03:51, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14650.08
Sample Tag: MW-14-56_060820
Collected Date/Time: 06/08/2020 15:15
Matrix: Groundwater
COC Reference: 128278

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 04:14, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	12	1		ug/L	1	123-91-1	

Lab Sample ID: S14650.09
Sample Tag: Trip Blank_060820
Collected Date/Time: 06/08/2020 00:01
Matrix: Water
COC Reference: 128278

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 06:28, Analyst: JGH

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

Lab Sample ID: S14650.09 (continued)
Sample Tag: Trip Blank_060820

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 06:28, Analyst: JGH (continued)

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

Merit Laboratories Login Checklist

Lab Set ID: S14650
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: Monitoring
Submitted: 06/09/2020 08:15 Login User: SRS

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.3
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[X] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128278

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: MIKE SPACIL / DAN STOCKARD
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR # 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO. FAX NO. P.O. NO.
E-MAIL ADDRESS: MICHAEL.SPACIL@ARCADIS.COM QUOTE NO.

INVOICE TO

CONTACT NAME X SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME SAMPLER(S) - PLEASE PRINT/SIGN NAME

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 DIOXANE By 8260B SIM	VOCs
14650.01	6/8/20	9:15	MW-14-63_060820	GW	3		3						X	
.02	6/8/20	10:40	MW-16-80_060820	GW	3		3						X	
.03	6/8/20	12:15	MW-15-73_060820	GW	3		3						X	
.04	6/8/20	11:35	MW-12-18_060820	GW	3		3							X
.05	6/8/20	13:00	MW-12-09_060820	GW	3		3						X	X
.06	6/8/20	13:40	MW-16-83_060820	GW	3		3						X	
.07	6/8/20	15:20	MW-13-51_060820	GW	3		3						X	
.08	6/8/20	1515	MW-14-56_060820	GW	3		3						X	
.09	6/8/20	—	TRIP BLANK_060820	W	1		1							X
	6/8/20													

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis	☒ Sampler	DATE 6/8/20	TIME 1550
RECEIVED BY: SIGNATURE/ORGANIZATION	Arcadis		DATE 6/8/20	TIME 15:50
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis		DATE 6/8/20	TIME 18:30
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox		DATE 6/8/20	TIME 18:30

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Dropbox		DATE 6/9/20	TIME 815
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE 6/9/20	TIME 815

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Revised Report

Report ID: S14651.01(02)
Generated on 07/07/2020
Replaces report S14651.01(01) generated on 06/16/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14651.01-S14651.10
Project: 30042872.04700 / RACER Lansing Plant 3
Collected Date(s): 06/08/2020
Submitted Date/Time: 06/09/2020 08:15
Sampled by: Austin Westhuis
P.O. #: 30042872.04700

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Sample .10 tag updated per client request

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
N/A	Not Applicable
SM3500-Cr B	Standard Method 3500 Cr B 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14651.01	MW-02-04(3)_060820	Groundwater	06/08/20 10:35
S14651.02	MW-18-97_060820	Groundwater	06/08/20 12:15
S14651.03	MW-18-94_060820	Groundwater	06/08/20 13:40
S14651.04	CH-14-RO_060820	Groundwater	06/08/20 15:55
S14651.05	UNK-11_060820	Groundwater	06/08/20 09:50
S14651.06	UNK-10_060820	Groundwater	06/08/20 11:00
S14651.07	P3-SB-28_060820	Groundwater	06/08/20 12:15
S14651.08	MW-05(3)_060820	Groundwater	06/08/20 14:15
S14651.09	MW-13-32_060820	Groundwater	06/08/20 15:45
S14651.10	Trip Blank_060820	Water	06/08/20 00:01

Lab Sample ID: S14651.01
Sample Tag: MW-02-04(3)_060820
Collected Date/Time: 06/08/2020 10:35
Matrix: Groundwater
COC Reference: 128282

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	2.0	IR
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	
Metal Digestion	Completed	SW3015A	06/12/20 09:15	JRH	

Metals

Method: E200.8, Run Date: 06/12/20 10:55, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	0.071	0.002		mg/L	5	7440-38-2	
Chromium	Not detected	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	0.017	0.005		mg/L	5	7440-02-0	
Vanadium	Not detected	0.005		mg/L	5	7440-62-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 04:36, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S14651.02
Sample Tag: MW-18-97_060820
Collected Date/Time: 06/08/2020 12:15
Matrix: Groundwater
COC Reference: 128282

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 04:58, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14651.03
Sample Tag: MW-18-94_060820
Collected Date/Time: 06/08/2020 13:40
Matrix: Groundwater
COC Reference: 128282

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 05:20, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S14651.04
Sample Tag: CH-14-RO_060820
Collected Date/Time: 06/08/2020 15:55
Matrix: Groundwater
COC Reference: 128282

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	2.0	IR
1	125ml Plastic	None	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/12/20 09:15	JRH	

Inorganics

Method: SM3500-Cr B, Run Date: 06/09/20 15:20, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chromium VI	8.0	0.25		mg/L	25	18540-29-9	

Metals

Method: E200.8, Run Date: 06/12/20 10:58, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	Not detected	0.002		mg/L	5	7440-38-2	
Chromium	7.21	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	0.012	0.005		mg/L	5	7440-02-0	
Vanadium	Not detected	0.005		mg/L	5	7440-62-2	

Lab Sample ID: S14651.05
Sample Tag: UNK-11_060820
Collected Date/Time: 06/08/2020 09:50
Matrix: Groundwater
COC Reference: 128282

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Amber	None	Yes	2.0	IR
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	
BNA Extraction	Completed	SW3510C	06/12/20 15:00	CM	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 15:23, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	

Lab Sample ID: S14651.05 (continued)
Sample Tag: UNK-11_060820

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 15:23, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 14:22, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	

Lab Sample ID: S14651.05 (continued)
Sample Tag: UNK-11_060820

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 14:22, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	3	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14651.06
Sample Tag: UNK-10_060820
Collected Date/Time: 06/08/2020 11:00
Matrix: Groundwater
COC Reference: 128282

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 08:43, Analyst: JGH

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

Lab Sample ID: S14651.06 (continued)
Sample Tag: UNK-10_060820

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 08:43, Analyst: JGH (continued)

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

Lab Sample ID: S14651.07
Sample Tag: P3-SB-28_060820
Collected Date/Time: 06/08/2020 12:15
Matrix: Groundwater
COC Reference: 128282

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Amber	None	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
BNA Extraction	Completed	SW3510C	06/12/20 15:00	CM	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 15:53, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	

Lab Sample ID: S14651.07 (continued)
Sample Tag: P3-SB-28_060820

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 15:53, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Lab Sample ID: S14651.08
Sample Tag: MW-05(3)_060820
Collected Date/Time: 06/08/2020 14:15
Matrix: Groundwater
COC Reference: 128282

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 09:03, Analyst: JGH

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

Lab Sample ID: S14651.08 (continued)
Sample Tag: MW-05(3)_060820

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 09:03, Analyst: JGH (continued)

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

Lab Sample ID: S14651.09
Sample Tag: MW-13-32_060820
Collected Date/Time: 06/08/2020 15:45
Matrix: Groundwater
COC Reference: 128282

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	2.0	IR
2	1L Amber	None	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/12/20 09:15	JRH	
BNA Extraction	Completed	SW3510C	06/12/20 15:00	CM	

Metals

Method: E200.8, Run Date: 06/12/20 11:00, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	Not detected	0.002		mg/L	5	7440-38-2	
Chromium	0.041	0.005		mg/L	5	7440-47-3	
Copper	0.005	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	0.185	0.005		mg/L	5	7440-02-0	
Vanadium	Not detected	0.005		mg/L	5	7440-62-2	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 16:24, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	

Lab Sample ID: S14651.09 (continued)
Sample Tag: MW-13-32_060820

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 16:24, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Lab Sample ID: S14651.10
Sample Tag: Trip Blank_060820
Collected Date/Time: 06/08/2020 00:01
Matrix: Water
COC Reference: 128282

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 06:47, Analyst: JGH

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

Lab Sample ID: S14651.10 (continued)
Sample Tag: Trip Blank_060820

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 06:47, Analyst: JGH (continued)

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

Merit Laboratories Login Checklist

Lab Set ID:S14651
Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / RACER Lansing Plant 3
Submitted:06/09/2020 08:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[X] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S14651 Submitted: 06/09/2020 08:15

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30042872.04700 / RACER Lansing Plant 3

Initial Preservation Check: 06/09/2020 08:31 MMC

Preservation Recheck (E200.8): N/A

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Lab ID	125 ml Plastic HNO_3	250 ml Plastic HNO_3	1 L Plastic HNO_3	250 ml Plastic H_2SO_4	125 ml Amber H_2SO_4	32 oz Glass HCl	125 ml Plastic NaOH	125 ml Amber $PbCO_3$ NaOH	pH					Notes
									<2	>12	other	ml add	new pH	
S14651.01	X								X					
S14651.04	X								X					
S14651.09	X								X					

Prepared by Merit Laboratories

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128282

CHAIN OF CUSTODY RECORD Plant 3

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-385-2494 FAX NO.: 248-994-2241 P.O. NO.:
E-MAIL ADDRESS: Michael.Spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700/RACER Lansing Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM5030C/8260C	1,4-Dioxane 8260B SIMS	Select Metals SM3471B	SVOCs SM8270B	Hexavalent Chromium
14651.01	6/8/20	1035	MW-02-04(3)_060820	GW	4		3	1						X	X		
.02	6/8/20	1215	MW-18-97_060820	GW	3		3							X			
.03	6/8/20	1340	MW-18-94_060820	GW	3		3							X			
.04	6/8/20	1555	CH-14-RD_060820	GW	2	1		1							X		X
.05	6/8/20	0950	UNK-11_060820	GW	5	2	3						X			X	
.06	6/8/20	1100	UNK-10_060820	GW	3		3						X				
.07	6/8/20	1215	P3-SB-28_060820	GW	2	2										X	
.08	6/8/20	1415	MW-05(3)_060820	GW	3		3						X				
.09	6/8/20	1545	MW-13-32_060820	GW	3	2		1							X	X	
.10	6/8/20	—	Trip Blank	GW	1		1						X				

* Select Metals: As, Ni, Pb, V, Cr, Cu

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Austin Westhuis / Arcadis ☒ Sampler	DATE 6/8/20	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	Daniel Stoddard Arcadis	DATE 6/8/20	TIME 17:10
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Daniel Stoddard	DATE 6/8/20	TIME 18:30
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 6/8/20	TIME 18:30

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 6/9/2020	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Ailsworth	DATE 6/9/2020	TIME 0915

SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS
SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS

NOTES. TEMP. ON ARRIVAL 2.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Revised Report

Report ID: S14653.01(02)
Generated on 07/07/2020
Replaces report S14653.01(01) generated on 06/17/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14653.01-S14653.07
Project: 30042872 RACER Lansing
Collected Date(s): 06/08/2020
Submitted Date/Time: 06/09/2020 08:15
Sampled by: Daniel Stockard
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Sample .07 tag updated per client request

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14653.01	MW-16-85_060820	Groundwater	06/08/20 09:55
S14653.02	MW-16-85_060820 MS	Groundwater	06/08/20 09:55
S14653.03	MW-16-85_060820 MSD	Groundwater	06/08/20 09:55
S14653.04	MW-16-75_060820	Groundwater	06/08/20 14:30
S14653.05	MW-16-77_060820	Groundwater	06/08/20 16:05
S14653.06	MW-16-76_060820	Groundwater	06/08/20 17:40
S14653.07	Trip Blank_060820	Water	06/08/20 00:01

Lab Sample ID: S14653.01
Sample Tag: MW-16-85_060820
Collected Date/Time: 06/08/2020 09:55
Matrix: Groundwater
COC Reference: 124710

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 14:08, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	8	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 07:26, Analyst: JGH

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

Lab Sample ID: S14653.01 (continued)
Sample Tag: MW-16-85_060820

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 07:26, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14653.02
Sample Tag: MW-16-85_060820 MS
Collected Date/Time: 06/08/2020 09:55
Matrix: Groundwater
COC Reference: 124710

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 21:54, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	60	1		ug/L	1	123-91-1	1

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 04:51, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	54	10		ug/L	1	60-29-7	1
Acetone	53	50		ug/L	1	67-64-1	1
Methyl iodide	53	1		ug/L	1	74-88-4	1
Carbon disulfide	54	5		ug/L	1	75-15-0	1
tert-Methyl butyl ether (MTBE)	52	5		ug/L	1	1634-04-4	1
Acrylonitrile	52	2		ug/L	1	107-13-1	1
2-Butanone (MEK)	49	25		ug/L	1	78-93-3	1
Dichlorodifluoromethane	49	5		ug/L	1	75-71-8	1
Chloromethane	53	5		ug/L	1	74-87-3	1
Vinyl chloride	52	1		ug/L	1	75-01-4	1
Bromomethane	48	5		ug/L	1	74-83-9	1
Chloroethane	52	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	47	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	54	1		ug/L	1	75-35-4	1
Methylene chloride	50	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	54	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	54	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	52	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	53	1		ug/L	1	67-66-3	1
Bromochloromethane	52	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	52	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	1
2-Hexanone	Not detected	50		ug/L	1	591-78-6	1
Carbon tetrachloride	50	1		ug/L	1	56-23-5	1
Benzene	54	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	50	1		ug/L	1	107-06-2	1
Trichloroethene	52	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	53	1		ug/L	1	78-87-5	1
Bromodichloromethane	51	1		ug/L	1	75-27-4	1
Dibromomethane	50	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	48	1		ug/L	1	10061-01-5	1

1-Spiked at 50ug/L

Lab Sample ID: S14653.02 (continued)
Sample Tag: MW-16-85_060820 MS

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 04:51, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	52	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	48	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	50	1		ug/L	1	79-00-5	1
Tetrachloroethene	46	1		ug/L	1	127-18-4	1
trans-1,4-Dichloro-2-butene	43	1		ug/L	1	110-57-6	1
Dibromochloromethane	48	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	49	1		ug/L	1	106-93-4	1
Chlorobenzene	50	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	50	1		ug/L	1	630-20-6	1
Ethylbenzene	51	1		ug/L	1	100-41-4	1
p,m-Xylene*	100	2		ug/L	1		1
o-Xylene	51	1		ug/L	1	95-47-6	1
Styrene	49	1		ug/L	1	100-42-5	1
Isopropylbenzene	52	5		ug/L	1	98-82-8	1
Bromoform	45	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	50	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	49	1		ug/L	1	96-18-4	1
n-Propylbenzene	51	1		ug/L	1	103-65-1	1
Bromobenzene	48	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	50	1		ug/L	1	108-67-8	1
tert-Butylbenzene	50	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	49	1		ug/L	1	95-63-6	1
sec-Butylbenzene	51	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	51	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	49	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	49	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	50	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	50	1		ug/L	1	526-73-8	1
n-Butylbenzene	49	1		ug/L	1	104-51-8	1
Hexachloroethane	46	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	47	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	48	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	48	5		ug/L	1	87-61-6	1
Naphthalene	50	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	49	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Lab Sample ID: S14653.03
Sample Tag: MW-16-85_060820 MSD
Collected Date/Time: 06/08/2020 09:55
Matrix: Groundwater
COC Reference: 124710

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 22:16, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	64	1		ug/L	1	123-91-1	1

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 05:11, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	56	10		ug/L	1	60-29-7	1
Acetone	57	50		ug/L	1	67-64-1	1
Methyl iodide	55	1		ug/L	1	74-88-4	1
Carbon disulfide	57	5		ug/L	1	75-15-0	1
tert-Methyl butyl ether (MTBE)	54	5		ug/L	1	1634-04-4	1
Acrylonitrile	55	2		ug/L	1	107-13-1	1
2-Butanone (MEK)	53	25		ug/L	1	78-93-3	1
Dichlorodifluoromethane	55	5		ug/L	1	75-71-8	1
Chloromethane	56	5		ug/L	1	74-87-3	1
Vinyl chloride	55	1		ug/L	1	75-01-4	1
Bromomethane	50	5		ug/L	1	74-83-9	1
Chloroethane	54	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	50	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	57	1		ug/L	1	75-35-4	1
Methylene chloride	53	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	56	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	56	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	54	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	54	1		ug/L	1	67-66-3	1
Bromochloromethane	54	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	54	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	53	50		ug/L	1	108-10-1	1
2-Hexanone	53	50		ug/L	1	591-78-6	1
Carbon tetrachloride	51	1		ug/L	1	56-23-5	1
Benzene	55	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	51	1		ug/L	1	107-06-2	1
Trichloroethene	53	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	55	1		ug/L	1	78-87-5	1
Bromodichloromethane	53	1		ug/L	1	75-27-4	1
Dibromomethane	52	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	52	1		ug/L	1	10061-01-5	1

1-Spiked at 50ug/L

Lab Sample ID: S14653.03 (continued)
Sample Tag: MW-16-85_060820 MSD

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 05:11, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	54	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	51	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	54	1		ug/L	1	79-00-5	1
Tetrachloroethene	49	1		ug/L	1	127-18-4	1
trans-1,4-Dichloro-2-butene	45	1		ug/L	1	110-57-6	1
Dibromochloromethane	50	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	52	1		ug/L	1	106-93-4	1
Chlorobenzene	52	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	50	1		ug/L	1	630-20-6	1
Ethylbenzene	53	1		ug/L	1	100-41-4	1
p,m-Xylene*	102	2		ug/L	1		1
o-Xylene	52	1		ug/L	1	95-47-6	1
Styrene	51	1		ug/L	1	100-42-5	1
Isopropylbenzene	52	5		ug/L	1	98-82-8	1
Bromoform	48	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	52	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	51	1		ug/L	1	96-18-4	1
n-Propylbenzene	52	1		ug/L	1	103-65-1	1
Bromobenzene	49	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	50	1		ug/L	1	108-67-8	1
tert-Butylbenzene	50	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	50	1		ug/L	1	95-63-6	1
sec-Butylbenzene	52	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	51	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	51	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	51	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	52	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	51	1		ug/L	1	526-73-8	1
n-Butylbenzene	50	1		ug/L	1	104-51-8	1
Hexachloroethane	47	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	50	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	49	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	49	5		ug/L	1	87-61-6	1
Naphthalene	52	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	50	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Lab Sample ID: S14653.04
Sample Tag: MW-16-75_060820
Collected Date/Time: 06/08/2020 14:30
Matrix: Groundwater
COC Reference: 124710

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/16/20 15:35, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S14653.05
Sample Tag: MW-16-77_060820
Collected Date/Time: 06/08/2020 16:05
Matrix: Groundwater
COC Reference: 124710

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 06:04, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14653.06
Sample Tag: MW-16-76_060820
Collected Date/Time: 06/08/2020 17:40
Matrix: Groundwater
COC Reference: 124710

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 06:26, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S14653.07
Sample Tag: Trip Blank_060820
Collected Date/Time: 06/08/2020 00:01
Matrix: Water
COC Reference: 124710

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 07:07, Analyst: JGH

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

Lab Sample ID: S14653.07 (continued)
Sample Tag: Trip Blank_060820

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 07:07, Analyst: JGH (continued)

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

Merit Laboratories Login Checklist

Lab Set ID: S14653
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 RACER Lansing
Submitted: 06/09/2020 08:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[X] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124710

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spaci / Daniel Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO: FAX NO: P.O. NO:
E-MAIL ADDRESS: mike.spaci@arcadis-us.com daniel.stockard@arcadis-us.com QUOTE NO:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Daniel Stockard

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs 8260C/SM5030C	1,4-Dioxane 8260B SIM	Special Instructions
.01/.02/.03	6/8/20	9:55	MW-16-85_060820	GW	9	9							X	X	MS/MSD
14653.04	6/8/20	14:30	MW-16-75_060820	GW	3	3								X	
.05	6/8/20	16:05	MW-16-77_060820	GW	3	3								X	
.06	6/8/20	17:40	MW-16-76_060820	GW	3	3								X	
.07			Trip Blank DMS		1								X	X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Daniel Stockard Arcadis (Sampler)	DATE 6/8/20	TIME 18:30
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 6/8/20	TIME 18:30
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 6/9/2020	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Pilcat	DATE 6/9/2020	TIME 0815
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: TEMP. ON ARRIVAL 2.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Analytical Laboratory Report

Report ID: S14702.01(01)
Generated on 06/16/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

Report Summary

Lab Sample ID(s): S14702.01-S14702.04
Project: 30042872 RACER Lansing
Collected Date(s): 06/09/2020
Submitted Date/Time: 06/10/2020 08:15
Sampled by: Unknown
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14702.01	MW-13-45_060920	Groundwater	06/09/20 09:45
S14702.02	MW-16-79_060920	Groundwater	06/09/20 12:25
S14702.03	MW-16-78_060920	Groundwater	06/09/20 15:15
S14702.04	PW-14-01_060920	Groundwater	06/09/20 16:20

Analytical Laboratory Report

Lab Sample ID: S14702.01
Sample Tag: MW-13-45_060920
Collected Date/Time: 06/09/2020 09:45
Matrix: Groundwater
COC Reference: 118476

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 06:48, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	38	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S14702.02
Sample Tag: MW-16-79_060920
Collected Date/Time: 06/09/2020 12:25
Matrix: Groundwater
COC Reference: 118476

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 15:09, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S14702.03
Sample Tag: MW-16-78_060920
Collected Date/Time: 06/09/2020 15:15
Matrix: Groundwater
COC Reference: 118476

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 15:32, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S14702.04
Sample Tag: PW-14-01_060920
Collected Date/Time: 06/09/2020 16:20
Matrix: Groundwater
COC Reference: 118476

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 20:47, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	240	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Merit Laboratories Login Checklist

Lab Set ID: S14702
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 RACER Lansing
Submitted: 06/10/2020 08:15 Login User: SRS

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.3
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[X] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc
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Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

118476

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Specil Daniel Stockard
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: FAX NO.: P.O. NO.:
E-MAIL ADDRESS: mike.specil@arcadis.com daniel.stockard@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☐ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872. RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME:
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED ☒ RSID ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260B SIM	ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)
14702.01	6/9/20	9:45	MW-13-45_060920	GW	3		3						X	
.02	6/9/20	12:25	MW-16-79_060920	GW	3		3						X	
.03	6/9/20	15:15	MW-16-78_060920	GW	3		3						X	
.04	6/9/20	16:20	DW-14-01_060920	GW	3		3						X	

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Daniel Stockard (X Sampler)	DATE 6/9/20	TIME 18:30
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 6/9/20	TIME 18:30
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 6/10/20	TIME 8:15
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	DATE 6/10/20	TIME 8:15

RELINQUISHED BY: SIGNATURE/ORGANIZATION — DATE — TIME
RECEIVED BY: SIGNATURE/ORGANIZATION — DATE — TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.1

Analytical Laboratory Report

Revised Report

Report ID: S14704.01(02)
Generated on 07/07/2020
Replaces report S14704.01(01) generated on 06/16/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14704.01-S14704.05
Project: 30042872.04700 / RACER Lansing - Plant 3
Collected Date(s): 06/09/2020
Submitted Date/Time: 06/10/2020 08:15
Sampled by: Unknown
P.O. #: 30042872.04700

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Report Narrative

Sample .05 tag updated per client request

Laboratory Certifications

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

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
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S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
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j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

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

Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
N/A	Not Applicable
SM3500-Cr B	Standard Method 3500 Cr B 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (5 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14704.01	MW-91-2R_060920	Groundwater	06/09/20 15:00
S14704.02	MW-91-2R_060920 MS	Groundwater	06/09/20 15:00
S14704.03	MW-91-2R_060920 MSD	Groundwater	06/09/20 15:00
S14704.04	MW-18-88_060920	Groundwater	06/09/20 15:30
S14704.05	Trip Blank_060920	Water	06/09/20 00:01

Lab Sample ID: S14704.01
Sample Tag: MW-91-2R_060920
Collected Date/Time: 06/09/2020 15:00
Matrix: Groundwater
COC Reference: 128283

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR
1	125ml Plastic	None	Yes	2.3	IR
1	125ml Plastic	HNO3	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	
Metal Digestion	Completed	SW3015A	06/12/20 09:15	JRH	

Inorganics

Method: SM3500-Cr B, Run Date: 06/10/20 11:35, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chromium VI	Not detected	0.01		mg/L	1	18540-29-9	

Metals

Method: E200.8, Run Date: 06/12/20 11:05, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	0.006	0.002		mg/L	5	7440-38-2	
Chromium	Not detected	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	Not detected	0.005		mg/L	5	7440-02-0	
Vanadium	Not detected	0.005		mg/L	5	7440-62-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 12:34, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	5	1		ug/L	1	123-91-1	

Lab Sample ID: S14704.02
Sample Tag: MW-91-2R_060920 MS
Collected Date/Time: 06/09/2020 15:00
Matrix: Groundwater
COC Reference: 128283

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR
1	125ml Plastic	None	Yes	2.3	IR
1	125ml Plastic	HNO3	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	
Metal Digestion	Completed	SW3015A	06/12/20 09:15	JRH	

Inorganics

Method: SM3500-Cr B, Run Date: 06/10/20 11:40, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chromium VI	0.089	0.01		mg/L	1	18540-29-9	I

Metals

Method: E200.8, Run Date: 06/12/20 11:06, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	0.266	0.002		mg/L	5	7440-38-2	
Chromium	0.259	0.005		mg/L	5	7440-47-3	
Copper	0.253	0.005		mg/L	5	7440-50-8	
Lead	0.236	0.003		mg/L	5	7439-92-1	
Nickel	0.261	0.005		mg/L	5	7440-02-0	
Vanadium	0.267	0.005		mg/L	5	7440-62-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 20:20, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	60	1		ug/L	1	123-91-1	1

I-Matrix interference with internal standard
1-Spiked at 50ug/L

Lab Sample ID: S14704.03
Sample Tag: MW-91-2R_060920 MSD
Collected Date/Time: 06/09/2020 15:00
Matrix: Groundwater
COC Reference: 128283

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR
1	125ml Plastic	None	Yes	2.3	IR
1	125ml Plastic	HNO3	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	
Metal Digestion	Completed	SW3015A	06/12/20 09:15	JRH	

Inorganics

Method: SM3500-Cr B, Run Date: 06/10/20 11:45, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chromium VI	0.106	0.01		mg/L	1	18540-29-9	I

Metals

Method: E200.8, Run Date: 06/12/20 11:07, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	0.265	0.002		mg/L	5	7440-38-2	
Chromium	0.258	0.005		mg/L	5	7440-47-3	
Copper	0.250	0.005		mg/L	5	7440-50-8	
Lead	0.235	0.003		mg/L	5	7439-92-1	
Nickel	0.253	0.005		mg/L	5	7440-02-0	
Vanadium	0.260	0.005		mg/L	5	7440-62-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 20:41, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	59	1		ug/L	1	123-91-1	1

I-Matrix interference with internal standard
1-Spiked at 50ug/L

Lab Sample ID: S14704.04
Sample Tag: MW-18-88_060920
Collected Date/Time: 06/09/2020 15:30
Matrix: Groundwater
COC Reference: 128283

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR
1	125ml Plastic	None	Yes	2.3	IR
1	125ml Plastic	HNO3	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	
Metal Digestion	Completed	SW3015A	06/12/20 09:15	JRH	

Inorganics

Method: SM3500-Cr B, Run Date: 06/10/20 11:50, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chromium VI	Not detected	0.01		mg/L	1	18540-29-9	

Metals

Method: E200.8, Run Date: 06/12/20 11:03, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	Not detected	0.002		mg/L	5	7440-38-2	
Chromium	Not detected	0.005		mg/L	5	7440-47-3	
Copper	Not detected	0.005		mg/L	5	7440-50-8	
Lead	Not detected	0.003		mg/L	5	7439-92-1	
Nickel	Not detected	0.005		mg/L	5	7440-02-0	
Vanadium	Not detected	0.005		mg/L	5	7440-62-2	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/15/20 15:31, Analyst: WAT

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	

Lab Sample ID: S14704.04 (continued)
Sample Tag: MW-18-88_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/15/20 15:31, Analyst: WAT (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14704.05
Sample Tag: Trip Blank_060920
Collected Date/Time: 06/09/2020 00:01
Matrix: Water
COC Reference: 128283

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 12:27, Analyst: JGH

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

Lab Sample ID: S14704.05 (continued)
Sample Tag: Trip Blank_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 12:27, Analyst: JGH (continued)

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

Merit Laboratories Login Checklist

Lab Set ID: S14704
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / RACER Lansing - Plant 3
Submitted: 06/10/2020 08:15 Login User: SRS

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.3
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[X] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S14704 Submitted: 06/10/2020 08:15

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30042872.04700 / RACER Lansing - Plant 3

Initial Preservation Check: 06/10/2020 08:42 SRS

Preservation Recheck (E200.8): N/A

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Lab ID	125 ml Plastic HNO_3	250 ml Plastic HNO_3	1 L Plastic HNO_3	250 ml Plastic H_2SO_4	125 ml Amber H_2SO_4	32 oz Glass HCl	125 ml Plastic NaOH	125 ml Amber $PbCO_3$ NaOH	pH					Notes
									<2	>12	other	ml add	new pH	
S14704.01	X								X					
S14704.02	X								X					
S14704.03	X								X					
S14704.04	X								X					

Prepared by Merit Laboratories

Plant 3

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128283

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2240 FAX NO.: 248-994-2241 P.O. NO.: 30042872.04700
E-MAIL ADDRESS: Michael.Spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700/RACER Lansing - Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM5030C/8260C	1,4-Dioxane 8260B SIMS	Select Metals *	SVOCs SM8270B	Hexavalent Chromium	Special Instructions
14704.01/02/03	6/9/20	1500	MW-91-2R_060920 MS/MSD	GW	15	3	9	3						X	X		X	* Select Metals:
.04	6/9/20	1530	MW-18-88_060920	GW	5	1	3	1					X		X		X	As, Ni, Pb, V, Cr, Cu
.05	6/9/20	—	Trip Blank	GW	1		1						X					

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
Aml Wyf b/Arcadis (☒ Sampler)	6/9/20	17:00
RECEIVED BY: Daniel Stoppard	6/9/20	17:00
RELINQUISHED BY: Daniel Stoppard	6/9/20	18:30
RECEIVED BY: Merit Dropbox	6/9/20	18:30

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
Merit Dropbox	6/10/20	815
RECEIVED BY:	6/10/20	815

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL: 2.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Revised Report

Report ID: S14705.01(02)
Generated on 07/07/2020
Replaces report S14705.01(01) generated on 06/17/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14705.01-S14705.11
Project: 30042872.04700 / RACER Lansing - Plant 2
Collected Date(s): 06/09/2020
Submitted Date/Time: 06/10/2020 08:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872.04700

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Samples .01 and .05 tags updated per client request

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Sample Summary (11 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14705.01	Trip Blank_060920	Water	06/09/20 00:01
S14705.02	MW-14-62_060920	Groundwater	06/09/20 10:00
S14705.03	MW-14-57_060920	Groundwater	06/09/20 09:55
S14705.04	MW-14-59_060920	Groundwater	06/09/20 11:15
S14705.05	DUP-01_060920	Groundwater	06/09/20 00:01
S14705.06	MW-14-54_060920	Groundwater	06/09/20 11:35
S14705.07	MW-14-60_060920	Groundwater	06/09/20 13:10
S14705.08	MW-14-55_060920	Groundwater	06/09/20 13:25
S14705.09	MW-14-58_060920	Groundwater	06/09/20 14:25
S14705.10	MW-13-43_060920	Groundwater	06/09/20 15:40
S14705.11	EB-05_060920	Water	06/09/20 00:01

Lab Sample ID: S14705.01
Sample Tag: Trip Blank_060920
Collected Date/Time: 06/09/2020 00:01
Matrix: Water
COC Reference: 128281

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 12:27, Analyst: JML

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

Lab Sample ID: S14705.01 (continued)
Sample Tag: Trip Blank_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 12:27, Analyst: JML (continued)

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

Lab Sample ID: S14705.02
Sample Tag: MW-14-62_060920
Collected Date/Time: 06/09/2020 10:00
Matrix: Groundwater
COC Reference: 128281

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR
1	1L Amber	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/15/20 12:00	JML	
BNA Extraction	Completed	SW3510C	06/12/20 15:00	CM	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 19:56, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	

Lab Sample ID: S14705.02 (continued)
Sample Tag: MW-14-62_060920

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 19:56, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 17:06, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	27	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 16:37, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	

Lab Sample ID: S14705.02 (continued)
Sample Tag: MW-14-62_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 16:37, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	36	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	1	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	

Lab Sample ID: S14705.02 (continued)

Sample Tag: MW-14-62_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 16:37, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14705.03
Sample Tag: MW-14-57_060920
Collected Date/Time: 06/09/2020 09:55
Matrix: Groundwater
COC Reference: 128281

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/15/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 17:28, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Lab Sample ID: S14705.04
Sample Tag: MW-14-59_060920
Collected Date/Time: 06/09/2020 11:15
Matrix: Groundwater
COC Reference: 128281

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR
1	1L Amber	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	
BNA Extraction	Completed	SW3510C	06/12/20 15:00	CM	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 20:26, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	

Lab Sample ID: S14705.04 (continued)
Sample Tag: MW-14-59_060920

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 20:26, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 16:37, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	56	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 16:56, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	

Lab Sample ID: S14705.04 (continued)
Sample Tag: MW-14-59_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 16:56, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	19	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	4	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	

Lab Sample ID: S14705.04 (continued)

Sample Tag: MW-14-59_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 16:56, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14705.05
Sample Tag: DUP-01_060920
Collected Date/Time: 06/09/2020 00:01
Matrix: Groundwater
COC Reference: 128281

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR
1	1L Amber	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	
BNA Extraction	Completed	SW3510C	06/12/20 15:00	CM	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 20:57, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	

Lab Sample ID: S14705.05 (continued)
Sample Tag: DUP-01_060920

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 20:57, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 17:00, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	56	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 17:15, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	

Lab Sample ID: S14705.05 (continued)
Sample Tag: DUP-01_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 17:15, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	18	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	4	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	

Lab Sample ID: S14705.05 (continued)

Sample Tag: DUP-01_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 17:15, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14705.06
Sample Tag: MW-14-54_060920
Collected Date/Time: 06/09/2020 11:35
Matrix: Groundwater
COC Reference: 128281

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/11/20 16:22, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	100		ug/L	10	60-29-7	Y
Acetone	Not detected	500		ug/L	10	67-64-1	Y
Methyl iodide	Not detected	10		ug/L	10	74-88-4	Y
Carbon disulfide	Not detected	50		ug/L	10	75-15-0	Y
tert-Methyl butyl ether (MTBE)	Not detected	50		ug/L	10	1634-04-4	Y
Acrylonitrile	Not detected	20		ug/L	10	107-13-1	Y
2-Butanone (MEK)	Not detected	250		ug/L	10	78-93-3	Y
Dichlorodifluoromethane	Not detected	50		ug/L	10	75-71-8	Y
Chloromethane	Not detected	50		ug/L	10	74-87-3	Y
Vinyl chloride	Not detected	10		ug/L	10	75-01-4	Y
Bromomethane	Not detected	50		ug/L	10	74-83-9	Y
Chloroethane	Not detected	50		ug/L	10	75-00-3	Y
Trichlorofluoromethane	Not detected	10		ug/L	10	75-69-4	Y
1,1-Dichloroethene	Not detected	10		ug/L	10	75-35-4	Y
Methylene chloride	Not detected	50		ug/L	10	75-09-2	Y
trans-1,2-Dichloroethene	Not detected	10		ug/L	10	156-60-5	Y
1,1-Dichloroethane	Not detected	10		ug/L	10	75-34-3	Y
cis-1,2-Dichloroethene	Not detected	10		ug/L	10	156-59-2	Y
Tetrahydrofuran*	Not detected	900		ug/L	10	109-99-9	Y
Chloroform	Not detected	10		ug/L	10	67-66-3	Y
Bromochloromethane	Not detected	10		ug/L	10	74-97-5	Y
1,1,1-Trichloroethane	Not detected	10		ug/L	10	71-55-6	Y
4-Methyl-2-pentanone (MIBK)	Not detected	500		ug/L	10	108-10-1	Y
2-Hexanone	Not detected	500		ug/L	10	591-78-6	Y
Carbon tetrachloride	Not detected	10		ug/L	10	56-23-5	Y
Benzene	620	10		ug/L	10	71-43-2	Y
1,2-Dichloroethane	Not detected	10		ug/L	10	107-06-2	Y
Trichloroethene	Not detected	10		ug/L	10	79-01-6	Y
1,2-Dichloropropane	Not detected	10		ug/L	10	78-87-5	Y
Bromodichloromethane	Not detected	10		ug/L	10	75-27-4	Y
Dibromomethane	Not detected	50		ug/L	10	74-95-3	Y
cis-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-01-5	Y
Toluene	130	10		ug/L	10	108-88-3	Y
trans-1,3-Dichloropropene	Not detected	10		ug/L	10	10061-02-6	Y
1,1,2-Trichloroethane	Not detected	10		ug/L	10	79-00-5	Y
Tetrachloroethene	Not detected	10		ug/L	10	127-18-4	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S14705.06 (continued)
Sample Tag: MW-14-54_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/11/20 16:22, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,4-Dichloro-2-butene	Not detected	10		ug/L	10	110-57-6	Y
Dibromochloromethane	Not detected	50		ug/L	10	124-48-1	Y
1,2-Dibromoethane	Not detected	10		ug/L	10	106-93-4	Y
Chlorobenzene	Not detected	10		ug/L	10	108-90-7	Y
1,1,1,2-Tetrachloroethane	Not detected	10		ug/L	10	630-20-6	Y
Ethylbenzene	1,710	10		ug/L	10	100-41-4	Y
p,m-Xylene*	1,350	20		ug/L	10		Y
o-Xylene	10	10		ug/L	10	95-47-6	Y
Styrene	Not detected	10		ug/L	10	100-42-5	Y
Isopropylbenzene	70	50		ug/L	10	98-82-8	Y
Bromoform	Not detected	10		ug/L	10	75-25-2	Y
1,1,2,2-Tetrachloroethane	Not detected	10		ug/L	10	79-34-5	Y
1,2,3-Trichloropropane	Not detected	10		ug/L	10	96-18-4	Y
n-Propylbenzene	190	10		ug/L	10	103-65-1	Y
Bromobenzene	Not detected	10		ug/L	10	108-86-1	Y
1,3,5-Trimethylbenzene	30	10		ug/L	10	108-67-8	Y
tert-Butylbenzene	Not detected	10		ug/L	10	98-06-6	Y
1,2,4-Trimethylbenzene	650	10		ug/L	10	95-63-6	Y
sec-Butylbenzene	Not detected	10		ug/L	10	135-98-8	Y
p-Isopropyltoluene	Not detected	50		ug/L	10	99-87-6	Y
1,3-Dichlorobenzene	Not detected	10		ug/L	10	541-73-1	Y
1,4-Dichlorobenzene	Not detected	10		ug/L	10	106-46-7	Y
1,2-Dichlorobenzene	Not detected	10		ug/L	10	95-50-1	Y
1,2,3-Trimethylbenzene	230	10		ug/L	10	526-73-8	Y
n-Butylbenzene	Not detected	10		ug/L	10	104-51-8	Y
Hexachloroethane	Not detected	50		ug/L	10	67-72-1	Y
1,2-Dibromo-3-chloropropane	Not detected	50		ug/L	10	96-12-8	Y
1,2,4-Trichlorobenzene	Not detected	50		ug/L	10	120-82-1	Y
1,2,3-Trichlorobenzene	Not detected	50		ug/L	10	87-61-6	Y
Naphthalene	220	50		ug/L	10	91-20-3	Y
2-Methylnaphthalene	Not detected	50		ug/L	10	91-57-6	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S14705.07
Sample Tag: MW-14-60_060920
Collected Date/Time: 06/09/2020 13:10
Matrix: Groundwater
COC Reference: 128281

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR
1	1L Amber	None	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	
BNA Extraction	Completed	SW3510C	06/12/20 15:00	CM	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 21:27, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	

Lab Sample ID: S14705.07 (continued)
Sample Tag: MW-14-60_060920

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/15/20 21:27, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 17:50, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	107	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/15/20 15:50, Analyst: WAT

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	5	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	32	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	

Lab Sample ID: S14705.07 (continued)
Sample Tag: MW-14-60_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/15/20 15:50, Analyst: WAT (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	

Lab Sample ID: S14705.07 (continued)

Sample Tag: MW-14-60_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/15/20 15:50, Analyst: WAT (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14705.08
Sample Tag: MW-14-55_060920
Collected Date/Time: 06/09/2020 13:25
Matrix: Groundwater
COC Reference: 128281

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 18:13, Analyst: JGH

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

Lab Sample ID: S14705.08 (continued)
Sample Tag: MW-14-55_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 18:13, Analyst: JGH (continued)

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

Lab Sample ID: S14705.09
Sample Tag: MW-14-58_060920
Collected Date/Time: 06/09/2020 14:25
Matrix: Groundwater
COC Reference: 128281

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 17:22, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	38	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 18:33, Analyst: JGH

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

Lab Sample ID: S14705.09 (continued)
Sample Tag: MW-14-58_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 18:33, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14705.10
Sample Tag: MW-13-43_060920
Collected Date/Time: 06/09/2020 15:40
Matrix: Groundwater
COC Reference: 128281

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 21:09, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	230	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S14705.11
Sample Tag: EB-05_060920
Collected Date/Time: 06/09/2020 00:01
Matrix: Water
COC Reference: 128281

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/11/20 13:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 12:47, Analyst: JGH

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

Lab Sample ID: S14705.11 (continued)
Sample Tag: EB-05_060920

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/10/20 12:47, Analyst: JGH (continued)

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

Merit Laboratories Login Checklist

Lab Set ID:S14705
Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / RACER Lansing - Plant 2
Submitted:06/10/2020 08:15 Login User: SRS

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.3
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[X] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

1 cooler

Merit Laboratories, Inc.
2000 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

12828

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spruell
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 313 407 8337 FAX NO.: PO NO.:
E-MAIL ADDRESS: Michael.Spruell@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.03740 / Racer Lansing Plant 2
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz
TURNAROUND TIME REQUIRED: ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking W ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM5030C/8260C	1,4-Dioxane 8260B SIM	SVOCs SM8270D
14705.01	6-9-20	AM	Trip Blank	L	1		1						X		
.02	6-9-20	1000	MW-14-62_060920	GW	4	1	3						X	X	X
.03	6-9-20	0955	MW-14-57_060920	GW	3		3							X	
.04	6-9-20	1115	MW-14-59_060920	GW	4	1	3						X	X	X
.05	6-9-20	AM	Dup-01	GW	4	1	3						X	X	X
.06	6-9-20	1135	MW-14-54_060920	GW	3		3						X		
.07	6-9-20	1310	MW-14-60_060920	GW	4	1	3						X	X	X
.08	6-9-20	1325	MW-14-55_060920	GW	3		3						X		
.09	6-9-20	1425	MW-14-58_060920	GW	3		3						X	X	
.10	6-9-20	1540	MW-13-43_060920	GW	3		3							X	
.11	6-9-20	AM	EB-05_060920	L	3		3						X		

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 6.9.20	TIME 1630
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 6/9/20	TIME 1635
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Daniel Stanford	DATE 6/9/20	TIME 18:20
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 6/9/20	TIME 18:30

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE 6/9/20	TIM 17:0
RECEIVED BY: SIGNATURE/ORGANIZATION	Daniel Stanford	DATE 6/9/20	TIM 17:00
SEAL NO	SEAL INTACT YES ☐ NO ☐	INITIALS Merit Dropbox	
SEAL NO	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: 6/10/20 815 10/10 20 815 2.3
TEMP. ON ARRIVAL

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev.

Analytical Laboratory Report

Revised Report

Report ID: S14757.01(02)
Generated on 07/07/2020
Replaces report S14757.01(01) generated on 06/17/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14757.01-S14757.10
Project: 30042872.04700 / RACER Lansing Plant 3
Collected Date(s): 06/10/2020
Submitted Date/Time: 06/11/2020 08:15
Sampled by: Austin Westhuis
P.O. #: 30042872.04700

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Sample .10 tag updated per client request

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14757.01	MW-13-49_061020	Groundwater	06/10/20 10:10
S14757.02	MW-13-48_061020	Groundwater	06/10/20 11:00
S14757.03	MW-13-25_061020	Groundwater	06/10/20 10:50
S14757.04	MW-13-34_061020	Groundwater	06/10/20 12:00
S14757.05	MW-13-46_061020	Groundwater	06/10/20 13:20
S14757.06	MW-13-29_061020	Groundwater	06/10/20 12:20
S14757.07	PW-14-03_061020	Groundwater	06/10/20 14:25
S14757.08	MW-13-24_061020	Groundwater	06/10/20 13:55
S14757.09	MW-12-20_061020	Groundwater	06/10/20 14:15
S14757.10	Trip Blank_061020	Water	06/10/20 00:01

Lab Sample ID: S14757.01
Sample Tag: MW-13-49_061020
Collected Date/Time: 06/10/2020 10:10
Matrix: Groundwater
COC Reference: 128286

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 23:10, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14757.02
Sample Tag: MW-13-48_061020
Collected Date/Time: 06/10/2020 11:00
Matrix: Groundwater
COC Reference: 128286

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 23:32, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	128	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/15/20 15:17, Analyst: WAT

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

Lab Sample ID: S14757.02 (continued)
Sample Tag: MW-13-48_061020

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/15/20 15:17, Analyst: WAT (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14757.03
Sample Tag: MW-13-25_061020
Collected Date/Time: 06/10/2020 10:50
Matrix: Groundwater
COC Reference: 128286

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/11/20 23:54, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	9	1		ug/L	1	123-91-1	

Lab Sample ID: S14757.04
Sample Tag: MW-13-34_061020
Collected Date/Time: 06/10/2020 12:00
Matrix: Groundwater
COC Reference: 128286

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 00:16, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	81	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 00:03, Analyst: JGH

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

Lab Sample ID: S14757.04 (continued)
Sample Tag: MW-13-34_061020

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 00:03, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14757.05
Sample Tag: MW-13-46_061020
Collected Date/Time: 06/10/2020 13:20
Matrix: Groundwater
COC Reference: 128286

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/16/20 15:57, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14757.06
Sample Tag: MW-13-29_061020
Collected Date/Time: 06/10/2020 12:20
Matrix: Groundwater
COC Reference: 128286

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 01:00, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	35	1		ug/L	1	123-91-1	

Lab Sample ID: S14757.07
Sample Tag: PW-14-03_061020
Collected Date/Time: 06/10/2020 14:25
Matrix: Groundwater
COC Reference: 128286

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 01:23, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	65	1		ug/L	1	123-91-1	

Lab Sample ID: S14757.08
Sample Tag: MW-13-24_061020
Collected Date/Time: 06/10/2020 13:55
Matrix: Groundwater
COC Reference: 128286

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/16/20 16:19, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	

Lab Sample ID: S14757.09
Sample Tag: MW-12-20_061020
Collected Date/Time: 06/10/2020 14:15
Matrix: Groundwater
COC Reference: 128286

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 02:07, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14757.10
Sample Tag: Trip Blank_061020
Collected Date/Time: 06/10/2020 00:01
Matrix: Water
COC Reference: 128286

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/11/20 21:32, Analyst: JGH

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

Lab Sample ID: S14757.10 (continued)
Sample Tag: Trip Blank_061020

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/11/20 21:32, Analyst: JGH (continued)

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

Merit Laboratories Login Checklist

Lab Set ID: S14757
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / RACER Lansing Plant 3
Submitted: 06/11/2020 08:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.7
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[X] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 3

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128286

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 313-407-8332 FAX NO.: 248-994-2241 P.O. NO.: 30042872.04700
E-MAIL ADDRESS: Michael.Spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700/RACER Lansing Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis/

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs sm6230C/8260C	1,4-Dioxane 8260B SIM
14757.01	6/10/20	1010	MW-13-49_061020	GW	3		3							X
.02	6/10/20	1100	MW-13-48_061020	GW	3		3						X	X
.03	6/10/20	1050	MW-13-25_061020	GW	3		3							X
.04	6/10/20	1200	MW-13-34_061020	GW	3		3						X	X
.05	6/10/20	1320	MW-13-46_061020	GW	3		3							X
.06	6/10/20	1220	MW-13-29_061020	GW	3		3							X
.07	6/10/20	1425	PW-14-03_061020	GW	3		3							X
.08	6/10/20	1355	MW-13-24_061020	GW	3		3							X
.09	6/10/20	1415	MW-12-20_061020	GW	3		3							X
.10	6/10/20	—	Trip Blank	GW	1		1						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: /Arcadis ☒ Sampler DATE: 6/10/20 TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit 24-hr Drop Box DATE: 6/10/20 TIME: 0850

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box DATE: 6/11/2020 TIME: 0815
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 6/11/2020 TIME: 0815

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Revised Report

Report ID: S14758.01(02)
Generated on 07/07/2020
Replaces report S14758.01(01) generated on 06/17/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14758.01-S14758.04
Project: 30042872 / RACER Lansing Plant 2
Collected Date(s): 06/10/2020
Submitted Date/Time: 06/11/2020 08:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Samples .01 and .03 tags updated per client request

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14758.01	Trip Blank_061020	Water	06/10/20 00:01
S14758.02	P2-MW-04_061020	Groundwater	06/10/20 10:05
S14758.03	MW-01(2)_061020	Groundwater	06/10/20 11:20
S14758.04	MW-16-82_061020	Groundwater	06/10/20 12:20

Lab Sample ID: S14758.01
Sample Tag: Trip Blank_061020
Collected Date/Time: 06/10/2020 00:01
Matrix: Water
COC Reference: 128284

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/11/20 21:52, Analyst: JGH

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

Lab Sample ID: S14758.01 (continued)
Sample Tag: Trip Blank_061020

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/11/20 21:52, Analyst: JGH (continued)

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

Lab Sample ID: S14758.02
Sample Tag: P2-MW-04_061020
Collected Date/Time: 06/10/2020 10:05
Matrix: Groundwater
COC Reference: 128284

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR
1	1L Amber	None	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	
BNA Extraction	Completed	SW3510C	06/15/20 11:00	CM	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/16/20 23:30, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	

Lab Sample ID: S14758.02 (continued)
Sample Tag: P2-MW-04_061020

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 06/16/20 23:30, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 02:30, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	31	1		ug/L	1	123-91-1	

Lab Sample ID: S14758.03
Sample Tag: MW-01(2)_061020
Collected Date/Time: 06/10/2020 11:20
Matrix: Groundwater
COC Reference: 128284

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/11/20 22:50, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	12	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S14758.03 (continued)
Sample Tag: MW-01(2)_061020

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/11/20 22:50, Analyst: JGH (continued)

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

Lab Sample ID: S14758.04
Sample Tag: MW-16-82_061020
Collected Date/Time: 06/10/2020 12:20
Matrix: Groundwater
COC Reference: 128284

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/12/20 12:40	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 02:52, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Merit Laboratories Login Checklist

Lab Set ID: S14758
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / RACER Lansing Plant 2
Submitted: 06/11/2020 08:15 Login User: MMC

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.7
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[X] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Plant 2

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128284

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Speil
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO: 248 994 2240 FAX NO. P.O. NO.
E-MAIL ADDRESS: Michael.speil@Arcadis.com QUOTE NO.

INVOICE TO

CONTACT NAME SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME: 30042872 / Pacer Lansing Plant 2
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM5230C / 8260C	1,4-Dioxane 8260C SIM	SVOCs SM8270D
147581.01	6-10-20	AM	Trip Blank	L	1		1						X		
.02	6-10-20	1005	PJ-MW-04_061020	GW	4	1	3							X	X
.03	6-10-20	1120	MW-01 (2)	GW	3		3						X		
.04	6-10-20	1220	MW-16-82_061020	GW	3		3							X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 6-10-20	TIME /
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit 24-hr Drop Box	DATE 6/11/20	TIME 0750
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 6/11/2020	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	M Pulcott	DATE 6/11/2020	TIME 0815
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: TEMP. ON ARRIVAL 2.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Analytical Laboratory Report

Revised Report

Report ID: S14769.01(02)
Generated on 07/07/2020
Replaces report S14769.01(01) generated on 06/17/2020

Report to

Attention: Mike Spacil
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 C:313-407-8332 FAX:
Email: Michael.Spacil@arcadis.com

Addtional Contacts: Daniel Stockard

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S14769.01-S14769.10
Project: 30042872.04700 / RACER Lansing Plant 3
Collected Date(s): 06/11/2020
Submitted Date/Time: 06/11/2020 14:00
Sampled by: Austin Westhuis
P.O. #: 30042872.04700

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Sample .10 tag updated per client request

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S14769.01	MW-02-02(3)_061120	Groundwater	06/11/20 09:25
S14769.02	MW-19_061120	Groundwater	06/11/20 10:45
S14769.03	Dup-08_061120	Groundwater	06/11/20 00:01
S14769.04	MW-12-21_061120	Groundwater	06/11/20 09:00
S14769.05	MW-13-22_061120	Groundwater	06/11/20 09:45
S14769.06	MW-15-71_061120	Groundwater	06/11/20 10:40
S14769.07	MW-13-23_061120	Groundwater	06/11/20 11:25
S14769.08	MW-14-64_061120	Groundwater	06/11/20 11:35
S14769.09	MW-13-41_061120	Groundwater	06/11/20 12:40
S14769.10	Trip Blank_061120	Water	06/11/20 00:01

Lab Sample ID: S14769.01
Sample Tag: MW-02-02(3)_061120
Collected Date/Time: 06/11/2020 09:25
Matrix: Groundwater
COC Reference: 128287

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/15/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/16/20 16:41, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14769.02
Sample Tag: MW-19_061120
Collected Date/Time: 06/11/2020 10:45
Matrix: Groundwater
COC Reference: 128287

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/15/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 18:35, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 01:21, Analyst: JGH

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

Lab Sample ID: S14769.02 (continued)
Sample Tag: MW-19_061120

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 01:21, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14769.03
Sample Tag: Dup-08_061120
Collected Date/Time: 06/11/2020 00:01
Matrix: Groundwater
COC Reference: 128287

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/15/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 18:57, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 01:40, Analyst: JGH

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

Lab Sample ID: S14769.03 (continued)
Sample Tag: Dup-08_061120

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 01:40, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14769.04
Sample Tag: MW-12-21_061120
Collected Date/Time: 06/11/2020 09:00
Matrix: Groundwater
COC Reference: 128287

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/15/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/16/20 18:10, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	230	10		ug/L	10	123-91-1	Y

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 01:59, Analyst: JGH

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

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S14769.04 (continued)
Sample Tag: MW-12-21_061120

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 01:59, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14769.05
Sample Tag: MW-13-22_061120
Collected Date/Time: 06/11/2020 09:45
Matrix: Groundwater
COC Reference: 128287

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/15/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/12/20 19:41, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	157	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 02:18, Analyst: JGH

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

Lab Sample ID: S14769.05 (continued)
Sample Tag: MW-13-22_061120

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 02:18, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S14769.06
Sample Tag: MW-15-71_061120
Collected Date/Time: 06/11/2020 10:40
Matrix: Groundwater
COC Reference: 128287

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/15/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/16/20 17:03, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14769.07
Sample Tag: MW-13-23_061120
Collected Date/Time: 06/11/2020 11:25
Matrix: Groundwater
COC Reference: 128287

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/15/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/16/20 17:26, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14769.08
Sample Tag: MW-14-64_061120
Collected Date/Time: 06/11/2020 11:35
Matrix: Groundwater
COC Reference: 128287

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/17/20 09:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/16/20 17:48, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S14769.09
Sample Tag: MW-13-41_061120
Collected Date/Time: 06/11/2020 12:40
Matrix: Groundwater
COC Reference: 128287

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/15/20 12:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 02:38, Analyst: JGH

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

Lab Sample ID: S14769.09 (continued)
Sample Tag: MW-13-41_061120

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/13/20 02:38, Analyst: JGH (continued)

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

Lab Sample ID: S14769.10
Sample Tag: Trip Blank_061120
Collected Date/Time: 06/11/2020 00:01
Matrix: Water
COC Reference: 128287

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/15/20 12:00	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/12/20 22:29, Analyst: JGH

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

Lab Sample ID: S14769.10 (continued)
Sample Tag: Trip Blank_061120

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 06/12/20 22:29, Analyst: JGH (continued)

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

Merit Laboratories Login Checklist

Lab Set ID: S14769
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / RACER Lansing Plant 3
Submitted: 06/11/2020 14:00 Login User: SRS

Attention: Mike Spacil
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-385-2494 FAX:
Email: Michael.Spacil@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128287

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Mike Spacil
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 313-407-8332 FAX NO.: 248-994-2241 P.O. NO.: 30042872.04700
E-MAIL ADDRESS: Michael.Spacil@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700 / RACER Lansing Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM6200C/8260C	1,4-Dioxane 8260B SIMS
14769.01	6/11/20	0925	MW-02-02(3)_061120	GW	3		3							X
.02	6/11/20	1045	MW-19_061120	GW	3		3						X	X
.03	6/11/20	—	Dup-08_061120	GW	3		3						X	X
.04	6/11/20	0900	MW-12-21_061120	GW	3		3						X	X
.05	6/11/20	0945	MW-13-22_061120	GW	3		3						X	X
.06	6/11/20	1040	MW-15-71_061120	GW	3		3							X
.07	6/11/20	1125	MW-13-23_061120	GW	3		3							X
.08	6/11/20	1135	MW-14-64_061120	GW	3		3							X
.09	6/11/20	1240	MW-13-41_061120	GW	3		3						X	
.10	6/11/20	—	Trip Blank	GW	1		1						X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	[signature] / Arcadis ☒ Sampler	DATE 6/11/20	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit 24-hr Drop Box	DATE 6/11/20	TIME 1400
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 6/11/20	TIME 1400
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	DATE 6/11/20	TIME 1400

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18

Analytical Laboratory Report

Report ID: S15102.01(01)
Generated on 07/02/2020

Report to

Attention: Trevor Swarthout
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2240 FAX:
Email: trevor.swarthout@arcadis.com

Addtional Contacts: Marina Samp

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S15102.01-S15102.02
Project: 30042872.04700 / RACER Lansing Plant 3
Collected Date(s): 06/23/2020
Submitted Date/Time: 06/23/2020 15:40
Sampled by: Marina Samp
P.O. #: 30042872.04700

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1
N/A	Not Applicable
SM4500-N(org)/NH	Standard Method 4500 N(org)B / NH3D 2011
SM4500-PE	Standard Method 4500 P E 2011
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S15102.01	TW-14-06_062320	Groundwater	06/23/20 11:50
S15102.02	TW-15-11_062320	Groundwater	06/23/20 14:00

Analytical Laboratory Report

Lab Sample ID: S15102.01
Sample Tag: TW-14-06_062320
Collected Date/Time: 06/23/2020 11:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	None	Yes	2.2	IR
1	250ml Plastic	H2SO4	Yes	2.2	IR
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/26/20 13:05	JGH	

Inorganics

Method: E300.0, Run Date: 06/24/20 09:11, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 06/24/20 20:11, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	2.7	0.2		mg/L	1		

Method: SM4500-PE, Run Date: 06/25/20 14:48, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	1.6	0.3	0.2	mg/L	25	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 06/25/20 14:03, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	13	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S15102.02
Sample Tag: TW-15-11_062320
Collected Date/Time: 06/23/2020 14:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	06/26/20 13:05	JGH	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 07/01/20 13:52, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	220	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Merit Laboratories Login Checklist

Lab Set ID: S15102
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / RACER Lansing Plant 3
Submitted: 06/23/2020 15:40 Login User: SRS

Attention: Trevor Swarthout
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2240 FAX:
Email: trevor.swarthout@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S15102 Submitted: 06/23/2020 15:40

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30042872.04700 / RACER Lansing Plant 3

Initial Preservation Check: 06/23/2020 15:54 SRS

Preservation Recheck (E200.8): N/A

Attention: Trevor Swarthout
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2240 FAX:
Email: trevor.swarthout@arcadis.com

Lab ID	125 ml Plastic HNO_3	250 ml Plastic HNO_3	1 L Plastic HNO_3	250 ml Plastic H_2SO_4	125 ml Amber H_2SO_4	32 oz Glass HCl	125 ml Plastic NaOH	125 ml Amber $PbCO_3$ NaOH	pH					Notes
									<2	>12	other	ml add	new pH	
S15102.01				X					X					

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Trevor Swarthout
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive Ste 500
CITY: Novi | STATE: MI | ZIP CODE: 48390
PHONE NO.: 248-994-2240 | FAX NO.:
E-MAIL ADDRESS: trevor.swarthout@arcadis.com
P.O. NO.: 30042872.04700
QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700/RACER Lansing Plant 3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Marina K Samp / Marina Samp
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO3	H2SO4	NaOH	MeOH	OTHER	1,4 Dioxane	Nitrate	TKN, TP	Special Instructions
15102.01	6/23/2020	1150	TW-14-06_062320	GW	5	1	3		1				✓	✓	✓	Send results to
.02	6/23/2020	1400	TW-15-11_062320	GW	3		3						✓			trevor.swarthout@
																arcadis.com &
																marina.samp@
																arcadis.com

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Marina K Samp / Arcadis — DATE: 06/23/2020 — TIME: 1540
RECEIVED BY: SIGNATURE/ORGANIZATION: Sam Smith — DATE: 6/23/20 — TIME: 1540
RELINQUISHED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:

SEAL NO. — SEAL INTACT YES☐ NO☐ — INITIALS:
SEAL NO. — SEAL INTACT YES☐ NO☐ — INITIALS:

NOTES: TEMP ON ARRIVAL: 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.17

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA75554

Sampling Date: 06/02/20

Report to:

Arcadis
300 S Washington Sq Suite 315
Lansing, MI 48933
marina.samp@arcadis.com; andrew.lorenz@arcadis.com;
alex.villhauer@arcadis.com; christine.gregg@arcadis.com;
ATTN: Alex Villhauer

Total number of pages in report: 30

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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Please share your ideas about how we can serve you better at:
EHS.US.CustomerCare@sgs.com

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA75554

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA75554-1	06/02/20	13:00	DSAW	06/04/20	AQ	Ground Water	MW-14-61_060220
FA75554-2	06/02/20	16:10	DSAW	06/04/20	AQ	Ground Water	MW-15-72_060220

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Summary of Hits

Job Number: FA75554
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/02/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA75554-1	**MW-14-61_060220**					
Perfluorobutanoic acid		0.0019 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0038	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0011 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0014 J	0.0036	0.00089	ug/l	EPA 537M BY ID
FA75554-2	**MW-15-72_060220**					
Perfluorobutanoic acid		0.0041 J	0.0080	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0041	0.0040	0.0015	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0010 J	0.0040	0.0010	ug/l	EPA 537M BY ID

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-14-61_060220		
Lab Sample ID:	FA75554-1	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22163.D	1	06/09/20 00:25	NG	06/05/20 10:00	OP80514	S3Q341
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0019	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0038	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0011	0.0036	0.00089	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0014	0.0036	0.00089	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-61_060220		
Lab Sample ID:	FA75554-1	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%		35-135%
	13C5-PFPeA	73%		50-150%
	13C5-PFHxA	78%		50-150%
	13C4-PFHpA	85%		50-150%
	13C8-PFOA	95%		50-150%
	13C9-PFNA	96%		50-150%
	13C6-PFDA	84%		50-150%
	13C7-PFUnDA	80%		40-140%
	13C2-PFDoDA	78%		40-140%
	13C2-PFTeDA	64%		30-130%
	13C3-PFBS	75%		50-150%
	13C3-PFHxS	82%		50-150%
	13C8-PFOS	86%		50-150%
	13C8-FOSA	84%		30-130%
	d3-MeFOSAA	75%		50-150%
	13C2-4:2FTS	82%		50-150%
	13C2-6:2FTS	101%		50-150%
	13C2-8:2FTS	83%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-15-72_060220		
Lab Sample ID:	FA75554-2	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22430.D	1	06/12/20 00:44	NG	06/10/20 08:30	OP80580	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0041	0.0080	0.0020	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0041	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	0.0010	0.0040	0.0010	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-15-72_060220		
Lab Sample ID:	FA75554-2	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	83%		35-135%
	13C5-PFPeA	84%		50-150%
	13C5-PFHxA	80%		50-150%
	13C4-PFHpA	85%		50-150%
	13C8-PFOA	95%		50-150%
	13C9-PFNA	101%		50-150%
	13C6-PFDA	105%		50-150%
	13C7-PFUnDA	107%		40-140%
	13C2-PFDoDA	106%		40-140%
	13C2-PFTeDA	105%		30-130%
	13C3-PFBS	79%		50-150%
	13C3-PFHxS	78%		50-150%
	13C8-PFOS	89%		50-150%
	13C8-FOSA	99%		30-130%
	d3-MeFOSAA	101%		50-150%
	13C2-4:2FTS	81%		50-150%
	13C2-6:2FTS	92%		50-150%
	13C2-8:2FTS	97%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

SGS Plant 2

SGS North America Inc - Orlando
Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

FA75554
SGS - ORLANDO JOB # :

PAGE 1 OF 1

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis of Michigan, LLC
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Michael.Spaci@arcadis.com Email:
Phone #: 313 - 407-8332
Sampler(s) Name(s) (Printed)
Sampler 1: Austin Westhuis Sampler 2: Dan Stockard

Project Information

Project Name: RACER Lansing Plant 2
Street: 2801 W. Saginaw Street
City: Lansing State: MI
Project #: 30042872.03700
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via method 537 mod. with isotope dilution per QSM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	CONTAINER INFORMATION OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NAOH+ZNAC	DI WATER	MEOH	PFAS	LAB USE ONLY
1	MW-14-61_060220	6/2/20	1300	DS	GW	2		2								X	
2	MW-15-72_060220	6/2/20	1610	DS	GW	2		2								X	

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other Standard

Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [x] EDD'S

INITIAL ASSESSMENT SP
LABEL VERIFICATION

Comments / Remarks

* Need all 24 analytes in EGLE list reported

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1	Dan Stockard Arcadis	6/3/20 1810	Austin Westhuis/Arcadis	Arcadis	6/3/20 1800	4 fedEx
2						
3						
4						
5	Relinquished by/Affiliation FX	Date Time:	Received By/Affiliation 6 06/04/2020 845	Relinquished By/Affiliation 7	Date Time:	Received By/Affiliation 8

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 2-7

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA75554: Chain of Custody
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SGS Sample Receipt Summary

Job Number: FA75554 **Client:** ARCADIS **Project:** RACER LANSING PLANT 2

Date / Time Received: 6/4/2020 8:45:00 AM **Delivery Method:** FED EX **Airbill #'s:** 1002284310460003281100138665992771

Therm ID: IR 1; **Therm CF:** -0.8; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.5);

Cooler Temps (Corrected) °C: Cooler 1: (2.7);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: SHAYLAP Date: 6/4/2020 8:45:00 AM Reviewer: _____ Date: _____

FA75554: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-MB	3Q22161.D	1	06/08/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-1

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	83%	35-135%
	13C5-PFPeA	81%	50-150%
	13C5-PFHxA	82%	50-150%
	13C4-PFHpA	83%	50-150%
	13C8-PFOA	83%	50-150%
	13C9-PFNA	82%	50-150%
	13C6-PFDA	78%	50-150%
	13C7-PFUnDA	72%	40-140%

Method Blank Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-MB	3Q22161.D	1	06/08/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-1

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	68%	40-140%
	13C2-PFTeDA	65%	30-130%
	13C3-PFBS	82%	50-150%
	13C3-PFHxS	82%	50-150%
	13C8-PFOS	77%	50-150%
	13C8-FOSA	84%	30-130%
	d3-MeFOSAA	72%	50-150%
	13C2-4:2FTS	78%	50-150%
	13C2-6:2FTS	79%	50-150%
	13C2-8:2FTS	72%	50-150%

Method Blank Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-MB	3Q22425.D	1	06/11/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-2

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	118%	35-135%
	13C5-PFPeA	116%	50-150%
	13C5-PFHxA	115%	50-150%
	13C4-PFHpA	115%	50-150%
	13C8-PFOA	116%	50-150%
	13C9-PFNA	113%	50-150%
	13C6-PFDA	117%	50-150%
	13C7-PFUnDA	121%	40-140%

Method Blank Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-MB	3Q22425.D	1	06/11/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-2

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	114%	40-140%
	13C2-PFTeDA	104%	30-130%
	13C3-PFBS	110%	50-150%
	13C3-PFHxS	108%	50-150%
	13C8-PFOS	103%	50-150%
	13C8-FOSA	116%	30-130%
	d3-MeFOSAA	116%	50-150%
	13C2-4:2FTS	110%	50-150%
	13C2-6:2FTS	108%	50-150%
	13C2-8:2FTS	107%	50-150%

Instrument Blank

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q341-IBLK	3Q22119.D	1	06/08/20	NG	n/a	n/a	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75554-1

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	103%	50-150%
	13C5-PFPeA	104%	50-150%
	13C5-PFHxA	105%	50-150%
	13C4-PFHpA	106%	50-150%
	13C8-PFOA	107%	50-150%
	13C9-PFNA	106%	50-150%
	13C6-PFDA	107%	50-150%
	13C7-PFUnDA	107%	50-150%

Instrument Blank

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q341-IBLK	3Q22119.D	1	06/08/20	NG	n/a	n/a	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75554-1

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	107%	50-150%
	13C2-PFTeDA	106%	50-150%
	13C3-PFBS	104%	50-150%
	13C3-PFHxS	106%	50-150%
	13C8-PFOS	105%	50-150%
	13C8-FOSA	111%	50-150%
	d3-MeFOSAA	106%	50-150%
	13C2-4:2FTS	98%	50-150%
	13C2-6:2FTS	99%	50-150%
	13C2-8:2FTS	99%	50-150%

Instrument Blank

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q343-IBLK	3Q22397.D	1	06/11/20	NG	n/a	n/a	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75554-2

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	110%	50-150%
	13C5-PFPeA	112%	50-150%
	13C5-PFHxA	115%	50-150%
	13C4-PFHpA	115%	50-150%
	13C8-PFOA	118%	50-150%
	13C9-PFNA	117%	50-150%
	13C6-PFDA	123%	50-150%
	13C7-PFUnDA	127%	50-150%

Instrument Blank

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q343-IBLK	3Q22397.D	1	06/11/20	NG	n/a	n/a	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75554-2

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	124%	50-150%
	13C2-PFTeDA	116%	50-150%
	13C3-PFBS	96%	50-150%
	13C3-PFHxS	106%	50-150%
	13C8-PFOS	107%	50-150%
	13C8-FOSA	122%	50-150%
	d3-MeFOSAA	125%	50-150%
	13C2-4:2FTS	105%	50-150%
	13C2-6:2FTS	108%	50-150%
	13C2-8:2FTS	112%	50-150%

Blank Spike Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-BS	3Q22160.D	1	06/08/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0757	95	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0767	96	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0758	95	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0746	93	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0762	95	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0771	96	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0757	95	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0755	94	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0761	95	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0778	97	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0762	95	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0776	97	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0778	97	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0782	98	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0783	98	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0764	96	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0687	86	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0698	87	60-130
754-91-6	PFOSA	0.08	0.0750	94	70-130
2355-31-9	MeFOSAA	0.08	0.0778	97	70-130
2991-50-6	EtFOSAA	0.08	0.0738	92	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0752	94	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0747	93	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0772	97	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	101%	35-135%
	13C5-PFPeA	99%	50-150%
	13C5-PFHxA	99%	50-150%
	13C4-PFHpA	102%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	99%	50-150%
	13C6-PFDA	94%	50-150%
	13C7-PFUnDA	87%	40-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-BS	3Q22160.D	1	06/08/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-1

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	86%	40-140%
	13C2-PFTeDA	81%	30-130%
	13C3-PFBS	98%	50-150%
	13C3-PFHxS	99%	50-150%
	13C8-PFOS	95%	50-150%
	13C8-FOSA	98%	30-130%
	d3-MeFOSAA	89%	50-150%
	13C2-4:2FTS	100%	50-150%
	13C2-6:2FTS	102%	50-150%
	13C2-8:2FTS	93%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-BS	3Q22424.D	1	06/11/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0751	94	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0777	97	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0751	94	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0771	96	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0784	98	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0778	97	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0764	96	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0745	93	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0761	95	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0805	101	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0769	96	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0778	97	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0790	99	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0764	96	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0772	97	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0750	94	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0847	106	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0698	87	60-130
754-91-6	PFOSA	0.08	0.0761	95	70-130
2355-31-9	MeFOSAA	0.08	0.0774	97	70-130
2991-50-6	EtFOSAA	0.08	0.0774	97	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0767	96	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0733	92	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0769	96	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	105%	35-135%
	13C5-PFPeA	103%	50-150%
	13C5-PFHxA	103%	50-150%
	13C4-PFHpA	101%	50-150%
	13C8-PFOA	100%	50-150%
	13C9-PFNA	100%	50-150%
	13C6-PFDA	102%	50-150%
	13C7-PFUnDA	107%	40-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-BS	3Q22424.D	1	06/11/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-2

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	101%	40-140%
	13C2-PFTeDA	94%	30-130%
	13C3-PFBS	99%	50-150%
	13C3-PFHxS	97%	50-150%
	13C8-PFOS	92%	50-150%
	13C8-FOSA	99%	30-130%
	d3-MeFOSAA	100%	50-150%
	13C2-4:2FTS	101%	50-150%
	13C2-6:2FTS	99%	50-150%
	13C2-8:2FTS	99%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-MS	3Q22176.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341
OP80514-MSD	3Q22177.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341
FA75555-9 [a]	3Q22175.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-1

CAS No.	Compound	FA75555-9 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	ND		0.069	0.0681	99	0.069	0.0600	87	13	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.069	0.0703	102	0.069	0.0626	91	12	70-130/30
307-24-4	Perfluorohexanoic acid	0.0010	J	0.069	0.0693	99	0.069	0.0617	88	12	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.069	0.0676	98	0.069	0.0601	87	12	70-130/30
335-67-1	Perfluorooctanoic acid	0.0047		0.069	0.0748	102	0.069	0.0660	89	13	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.069	0.0691	100	0.069	0.0610	88	12	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.069	0.0703	102	0.069	0.0622	90	12	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.069	0.0696	101	0.069	0.0606	88	14	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.069	0.0698	101	0.069	0.0621	90	12	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.069	0.0701	102	0.069	0.0611	89	14	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.069	0.0724	105	0.069	0.0616	89	16	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0011	J	0.069	0.0710	101	0.069	0.0620	88	14	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.069	0.0730	106	0.069	0.0655	95	11	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.0018	J	0.069	0.0706	100	0.069	0.0634	89	11	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.069	0.0756	110	0.069	0.0668	97	12	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0333		0.069	0.0727	57*	0.069	0.0651	46*	11	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.069	0.0627	91	0.069	0.0578	84	8	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.069	0.0616	89	0.069	0.0543	79	13	60-130/30
754-91-6	PFOSA	ND		0.069	0.0655	95	0.069	0.0583	85	12	70-130/30
2355-31-9	MeFOSAA	ND		0.069	0.0697	101	0.069	0.0604	88	14	70-130/30
2991-50-6	EtFOSAA	ND		0.069	0.0699	101	0.069	0.0585	85	18	70-130/30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.069	0.0666	97	0.069	0.0600	87	10	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.069	0.0683	99	0.069	0.0620	90	10	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.069	0.0702	102	0.069	0.0622	90	12	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	FA75555-9	Limits
	13C4-PFBA	62%	72%		35-135%
	13C5-PFPeA	75%	86%		50-150%
	13C5-PFHxA	78%	90%		50-150%
	13C4-PFHpA	88%	102%		50-150%
	13C8-PFOA	95%	111%		50-150%
	13C9-PFNA	98%	115%		50-150%
	13C6-PFDA	92%	107%		50-150%
	13C7-PFUnDA	87%	103%		40-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-MS	3Q22176.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341
OP80514-MSD	3Q22177.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341
FA75555-9 [a]	3Q22175.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-1

CAS No.	ID Standard Recoveries	MS	MSD	FA75555-9	Limits
	13C2-PFDoDA	83%	99%		40-140%
	13C2-PFTeDA	80%	96%		30-130%
	13C3-PFBS	75%	87%		50-150%
	13C3-PFHxS	85%	99%		50-150%
	13C8-PFOS	91%	107%		50-150%
	13C8-FOSA	86%	106%		30-130%
	d3-MeFOSAA	84%	104%		50-150%
	13C2-4:2FTS	86%	99%		50-150%
	13C2-6:2FTS	106%	123%		50-150%
	13C2-8:2FTS	95%	111%		50-150%

(a) Sample used for QC purposes only.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-MS	3Q22436.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343
OP80580-MSD	3Q22437.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343
FA75555-9	3Q22435.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-2

CAS No.	Compound	FA75555-9 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	ND		0.0741	0.0708	96	0.0741	0.0699	94	1	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.0741	0.0741	100	0.0741	0.0738	100	0	70-130/30
307-24-4	Perfluorohexanoic acid	0.0012	J	0.0741	0.0716	95	0.0741	0.0711	94	1	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.0741	0.0730	99	0.0741	0.0718	97	2	70-130/30
335-67-1	Perfluorooctanoic acid	0.0057		0.0741	0.0788	99	0.0741	0.0794	99	1	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0741	0.0728	98	0.0741	0.0715	97	2	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0741	0.0704	95	0.0741	0.0690	93	2	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0741	0.0694	94	0.0741	0.0681	92	2	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0741	0.0711	96	0.0741	0.0700	95	2	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0741	0.0710	96	0.0741	0.0703	95	1	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0741	0.0718	97	0.0741	0.0709	96	1	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0013	J	0.0741	0.0723	96	0.0741	0.0717	95	1	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0741	0.0698	94	0.0741	0.0700	95	0	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0741	0.0724	98	0.0741	0.0704	95	3	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0741	0.0804	109	0.0741	0.0791	107	2	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0038		0.0741	0.0730	93	0.0741	0.0713	91	2	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0741	0.0832	112	0.0741	0.0811	109	3	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0741	0.0663	90	0.0741	0.0641	87	3	60-130/30
754-91-6	PFOSA	ND		0.0741	0.0706	95	0.0741	0.0700	95	1	70-130/30
2355-31-9	MeFOSAA	ND		0.0741	0.0721	97	0.0741	0.0705	95	2	70-130/30
2991-50-6	EtFOSAA	ND		0.0741	0.0717	97	0.0741	0.0704	95	2	70-130/30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0741	0.0711	96	0.0741	0.0701	95	1	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0741	0.0682	92	0.0741	0.0711	96	4	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0741	0.0696	94	0.0741	0.0710	96	2	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	FA75555-9	Limits
	13C4-PFBA	73%	67%	66%	35-135%
	13C5-PFPeA	83%	76%	74%	50-150%
	13C5-PFHxA	77%	70%	70%	50-150%
	13C4-PFHpA	82%	76%	75%	50-150%
	13C8-PFOA	93%	84%	85%	50-150%
	13C9-PFNA	100%	91%	88%	50-150%
	13C6-PFDA	105%	97%	93%	50-150%
	13C7-PFUnDA	113%	101%	100%	40-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75554
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-MS	3Q22436.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343
OP80580-MSD	3Q22437.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343
FA75555-9	3Q22435.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75554-2

CAS No.	ID Standard Recoveries	MS	MSD	FA75555-9	Limits
	13C2-PFDoDA	108%	100%	96%	40-140%
	13C2-PFTeDA	106%	97%	92%	30-130%
	13C3-PFBS	80%	73%	70%	50-150%
	13C3-PFHxS	77%	71%	70%	50-150%
	13C8-PFOS	87%	78%	76%	50-150%
	13C8-FOSA	92%	85%	83%	30-130%
	d3-MeFOSAA	102%	94%	91%	50-150%
	13C2-4:2FTS	83%	77%	71%	50-150%
	13C2-6:2FTS	100%	90%	86%	50-150%
	13C2-8:2FTS	105%	93%	86%	50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA75555

Sampling Dates: 06/02/20 - 06/03/20

Report to:

andrea.colby@sgs.com

Total number of pages in report: 53

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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Test results relate only to samples analyzed.

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA75555

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
This report contains results reported as ND = Not detected. The following applies: Organics ND = Not detected above the MDL							
FA75555-1	06/02/20	11:25	AWDS	06/04/20	AQ	Ground Water	MW-18-102_060220
FA75555-2	06/02/20	12:40	AWDS	06/04/20	AQ	Ground Water	MW-18-104_060220
FA75555-3	06/02/20	13:45	AWDS	06/04/20	AQ	Ground Water	MW-18-106_060220
FA75555-4	06/02/20	16:00	AWDS	06/04/20	AQ	Ground Water	MW-18-99_060220
FA75555-5	06/02/20	17:20	AWDS	06/04/20	AQ	Ground Water	MW-18-96_060220
FA75555-6	06/03/20	09:50	AWDS	06/04/20	AQ	Field Blank Water	FB-01_060320
FA75555-7	06/03/20	09:55	AWDS	06/04/20	AQ	Ground Water	MW-18-98_060320
FA75555-8	06/03/20	11:00	AWDS	06/04/20	AQ	Ground Water	MW-18-100_060320
FA75555-9	06/03/20	13:00	AWDS	06/04/20	AQ	Ground Water	MW-19-108_060320
FA75555-9D	06/03/20	13:00	AWDS	06/04/20	AQ	Water Dup/MSD	MW-19-108_060320
FA75555-9S	06/03/20	13:00	AWDS	06/04/20	AQ	Water Matrix Spike	MW-19-108_060320
FA75555-10	06/03/20	13:55	AWDS	06/04/20	AQ	Ground Water	MW-18-92_060320

Sample Summary
(continued)

Arcadis

Job No: FA75555

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA75555-11	06/03/20	14:55	AWDS	06/04/20	AQ	Ground Water	MW-19-107_060320
FA75555-12	06/03/20	00:00	AWDS	06/04/20	AQ	Ground Water	MW-19-111_060320

Summary of Hits

Job Number: FA75555
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/02/20 thru 06/03/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA75555-1	**MW-18-102_060220**					
No hits reported in this sample.						
FA75555-2	**MW-18-104_060220**					
Perfluorooctanoic acid		0.0015 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0020 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0015 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0060	0.0034	0.0013	ug/l	EPA 537M BY ID
FA75555-3	**MW-18-106_060220**					
Perfluorobutanoic acid		0.0023 J	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0030 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0055	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0038	0.0034	0.0013	ug/l	EPA 537M BY ID
FA75555-4	**MW-18-99_060220**					
Perfluorobutanoic acid		0.0150	0.0074	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0033 J	0.0037	0.0014	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0038	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0030 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0069	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0013 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0018 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0017 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0621	0.0037	0.0014	ug/l	EPA 537M BY ID
FA75555-5	**MW-18-96_060220**					
Perfluorohexanoic acid		0.0016 J	0.0063	0.0016	ug/l	EPA 537M BY ID
FA75555-6	**FB-01_060320**					
No hits reported in this sample.						
FA75555-7	**MW-18-98_060320**					
Perfluorobutanoic acid		0.0148	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0087	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0081	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0051	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0171	0.0034	0.00086	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA75555
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/02/20 thru 06/03/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorononanoic acid		0.00093 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0021 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0013 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0014 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0800	0.0034	0.0013	ug/l	EPA 537M BY ID
FA75555-8	**MW-18-100_060320**					
Perfluorobutanoic acid		0.0069	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0022 J	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0031 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0018 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0041	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0035	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0043	0.0034	0.0013	ug/l	EPA 537M BY ID
FA75555-9	**MW-19-108_060320**					
Perfluorohexanoic acid		0.0012 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0057	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0013 J	0.0037	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0038	0.0037	0.0014	ug/l	EPA 537M BY ID
FA75555-10	**MW-18-92_060320**					
No hits reported in this sample.						
FA75555-11	**MW-19-107_060320**					
Perfluorobutanoic acid		0.0025 J	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0027 J	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0012 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0048	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0014 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0029 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0030 J	0.0034	0.0013	ug/l	EPA 537M BY ID
FA75555-12	**MW-19-111_060320**					
Perfluorobutanoic acid		0.0023 J	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0017 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0014 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0062	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0014 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0014 J	0.0034	0.00086	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA75555
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/02/20 thru 06/03/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorooctanesulfonic acid		0.0014 J	0.0034	0.0013	ug/l	EPA 537M BY ID

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-18-102_060220		
Lab Sample ID:	FA75555-1	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22165.D	1	06/09/20 00:55	NG	06/05/20 10:00	OP80514	S3Q341
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-102_060220		
Lab Sample ID:	FA75555-1	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	86%		35-135%
	13C5-PFPeA	94%		50-150%
	13C5-PFHxA	97%		50-150%
	13C4-PFHpA	102%		50-150%
	13C8-PFOA	104%		50-150%
	13C9-PFNA	101%		50-150%
	13C6-PFDA	97%		50-150%
	13C7-PFUnDA	87%		40-140%
	13C2-PFDoDA	72%		40-140%
	13C2-PFTeDA	64%		30-130%
	13C3-PFBS	95%		50-150%
	13C3-PFHxS	101%		50-150%
	13C8-PFOS	95%		50-150%
	13C8-FOSA	100%		30-130%
	d3-MeFOSAA	85%		50-150%
	13C2-4:2FTS	94%		50-150%
	13C2-6:2FTS	101%		50-150%
	13C2-8:2FTS	89%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-104_060220		
Lab Sample ID:	FA75555-2	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22166.D	1	06/09/20 01:09	NG	06/05/20 10:00	OP80514	S3Q341
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0015	0.0034	0.00086	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0020	0.0034	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0015	0.0034	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0060	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-104_060220		
Lab Sample ID:	FA75555-2	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	74%		35-135%
	13C5-PFPeA	88%		50-150%
	13C5-PFHxA	93%		50-150%
	13C4-PFHpA	100%		50-150%
	13C8-PFOA	102%		50-150%
	13C9-PFNA	99%		50-150%
	13C6-PFDA	93%		50-150%
	13C7-PFUnDA	89%		40-140%
	13C2-PFDoDA	79%		40-140%
	13C2-PFTeDA	70%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	97%		50-150%
	13C8-PFOS	92%		50-150%
	13C8-FOSA	92%		30-130%
	d3-MeFOSAA	85%		50-150%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	99%		50-150%
	13C2-8:2FTS	88%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-106_060220		
Lab Sample ID:	FA75555-3	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22167.D	1	06/09/20 01:24	NG	06/05/20 10:00	OP80514	S3Q341
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0023	0.0069	0.0017	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0030	0.0034	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0055	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0038	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-106_060220		
Lab Sample ID:	FA75555-3	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	85%		35-135%
	13C5-PFPeA	96%		50-150%
	13C5-PFHxA	100%		50-150%
	13C4-PFHpA	106%		50-150%
	13C8-PFOA	108%		50-150%
	13C9-PFNA	108%		50-150%
	13C6-PFDA	101%		50-150%
	13C7-PFUnDA	91%		40-140%
	13C2-PFDoDA	87%		40-140%
	13C2-PFTeDA	83%		30-130%
	13C3-PFBS	97%		50-150%
	13C3-PFHxS	103%		50-150%
	13C8-PFOS	99%		50-150%
	13C8-FOSA	96%		30-130%
	d3-MeFOSAA	93%		50-150%
	13C2-4:2FTS	97%		50-150%
	13C2-6:2FTS	105%		50-150%
	13C2-8:2FTS	96%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-99_060220		
Lab Sample ID:	FA75555-4	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22431.D	1	06/12/20 00:59	NG	06/10/20 08:30	OP80580	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0150	0.0074	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0033	0.0037	0.0014	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0038	0.0037	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0030	0.0037	0.00093	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0069	0.0037	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	0.0013	0.0037	0.00093	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0037	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0037	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0037	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0018	0.0037	0.00093	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.0017	0.0037	0.00093	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0621	0.0037	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-99_060220		
Lab Sample ID:	FA75555-4	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	83%		50-150%
	13C5-PFHxA	77%		50-150%
	13C4-PFHpA	77%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	86%		50-150%
	13C6-PFDA	93%		50-150%
	13C7-PFUnDA	107%		40-140%
	13C2-PFDoDA	98%		40-140%
	13C2-PFTeDA	96%		30-130%
	13C3-PFBS	79%		50-150%
	13C3-PFHxS	72%		50-150%
	13C8-PFOS	73%		50-150%
	13C8-FOSA	76%		30-130%
	d3-MeFOSAA	95%		50-150%
	13C2-4:2FTS	79%		50-150%
	13C2-6:2FTS	88%		50-150%
	13C2-8:2FTS	93%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-96_060220		
Lab Sample ID:	FA75555-5	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22169.D	1.88	06/09/20 01:54	NG	06/05/20 10:00	OP80514	S3Q341
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid [a]	ND	0.013	0.0031	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0063	0.0024	ug/l	
307-24-4	Perfluorohexanoic acid	0.0016	0.0063	0.0016	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0063	0.0016	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0063	0.0016	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0063	0.0016	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0063	0.0016	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0063	0.0016	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0063	0.0024	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0063	0.0016	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0063	0.0016	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0063	0.0016	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0063	0.0016	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0063	0.0016	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0063	0.0016	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0063	0.0024	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0063	0.0016	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0063	0.0016	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA [a]	ND	0.0063	0.0016	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.013	0.0063	ug/l	
2991-50-6	EtFOSAA	ND	0.013	0.0063	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.013	0.0031	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.013	0.0031	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-96_060220		
Lab Sample ID:	FA75555-5	**Date Sampled:**	06/02/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.013	0.0031	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	139% [b]		35-135%
	13C5-PFPeA	139%		50-150%
	13C5-PFHxA	141%		50-150%
	13C4-PFHpA	146%		50-150%
	13C8-PFOA	147%		50-150%
	13C9-PFNA	134%		50-150%
	13C6-PFDA	118%		50-150%
	13C7-PFUnDA	97%		40-140%
	13C2-PFDoDA	91%		40-140%
	13C2-PFTeDA	90%		30-130%
	13C3-PFBS	139%		50-150%
	13C3-PFHxS	142%		50-150%
	13C8-PFOS	118%		50-150%
	13C8-FOSA	136% [b]		30-130%
	d3-MeFOSAA	106%		50-150%
	13C2-4:2FTS	138%		50-150%
	13C2-6:2FTS	143%		50-150%
	13C2-8:2FTS	107%		50-150%

(a) Associated ID Standard outside control limits high, however sample is ND.
(b) Outside control limits high, sample is ND.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB-01_060320		
Lab Sample ID:	FA75555-6	**Date Sampled:**	06/03/20
Matrix:	AQ - Field Blank Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22432.D	1	06/12/20 01:14	NG	06/10/20 08:30	OP80580	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0074	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0037	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0037	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0037	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0037	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0037	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0037	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0037	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0037	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0037	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0037	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0037	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB-01_060320		
Lab Sample ID:	FA75555-6	**Date Sampled:**	06/03/20
Matrix:	AQ - Field Blank Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	107%		35-135%
	13C5-PFPeA	104%		50-150%
	13C5-PFHxA	105%		50-150%
	13C4-PFHpA	104%		50-150%
	13C8-PFOA	104%		50-150%
	13C9-PFNA	104%		50-150%
	13C6-PFDA	109%		50-150%
	13C7-PFUnDA	119%		40-140%
	13C2-PFDoDA	116%		40-140%
	13C2-PFTeDA	114%		30-130%
	13C3-PFBS	101%		50-150%
	13C3-PFHxS	99%		50-150%
	13C8-PFOS	94%		50-150%
	13C8-FOSA	103%		30-130%
	d3-MeFOSAA	112%		50-150%
	13C2-4:2FTS	98%		50-150%
	13C2-6:2FTS	96%		50-150%
	13C2-8:2FTS	103%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-98_060320		
Lab Sample ID:	FA75555-7	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22173.D	1	06/09/20 02:54	NG	06/05/20 10:00	OP80514	S3Q341
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0148	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0087	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0081	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0051	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0171	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	0.00093	0.0034	0.00086	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0021	0.0034	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0013	0.0034	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.0014	0.0034	0.00086	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0800	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-98_060320		
Lab Sample ID:	FA75555-7	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	58%		35-135%
	13C5-PFPeA	66%		50-150%
	13C5-PFHxA	69%		50-150%
	13C4-PFHpA	73%		50-150%
	13C8-PFOA	77%		50-150%
	13C9-PFNA	77%		50-150%
	13C6-PFDA	75%		50-150%
	13C7-PFUnDA	66%		40-140%
	13C2-PFDoDA	52%		40-140%
	13C2-PFTeDA	41%		30-130%
	13C3-PFBS	67%		50-150%
	13C3-PFHxS	71%		50-150%
	13C8-PFOS	72%		50-150%
	13C8-FOSA	60%		30-130%
	d3-MeFOSAA	66%		50-150%
	13C2-4:2FTS	70%		50-150%
	13C2-6:2FTS	78%		50-150%
	13C2-8:2FTS	75%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-100_060320		
Lab Sample ID:	FA75555-8	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22174.D	1	06/09/20 03:09	NG	06/05/20 10:00	OP80514	S3Q341
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0069	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0022	0.0034	0.0013	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0031	0.0034	0.00086	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0018	0.0034	0.00086	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0041	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0035	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0043	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-100_060320		
Lab Sample ID:	FA75555-8	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	91%		35-135%
	13C5-PFPeA	95%		50-150%
	13C5-PFHxA	95%		50-150%
	13C4-PFHpA	98%		50-150%
	13C8-PFOA	100%		50-150%
	13C9-PFNA	98%		50-150%
	13C6-PFDA	95%		50-150%
	13C7-PFUnDA	88%		40-140%
	13C2-PFDoDA	82%		40-140%
	13C2-PFTeDA	78%		30-130%
	13C3-PFBS	95%		50-150%
	13C3-PFHxS	97%		50-150%
	13C8-PFOS	92%		50-150%
	13C8-FOSA	103%		30-130%
	d3-MeFOSAA	86%		50-150%
	13C2-4:2FTS	94%		50-150%
	13C2-6:2FTS	100%		50-150%
	13C2-8:2FTS	91%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-108_060320		
Lab Sample ID:	FA75555-9	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22435.D	1	06/12/20 01:59	NG	06/10/20 08:30	OP80580	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0074	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0037	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	0.0012	0.0037	0.00093	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0037	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0057	0.0037	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0037	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0037	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0037	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0037	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0037	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0013	0.0037	0.00093	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0037	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0037	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0037	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0038	0.0037	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0037	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0074	0.0037	ug/l	
2991-50-6	EtFOSAA	ND	0.0074	0.0037	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-108_060320		
Lab Sample ID:	FA75555-9	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	66%		35-135%
	13C5-PFPeA	74%		50-150%
	13C5-PFHxA	70%		50-150%
	13C4-PFHpA	75%		50-150%
	13C8-PFOA	85%		50-150%
	13C9-PFNA	88%		50-150%
	13C6-PFDA	93%		50-150%
	13C7-PFUnDA	100%		40-140%
	13C2-PFDoDA	96%		40-140%
	13C2-PFTeDA	92%		30-130%
	13C3-PFBS	70%		50-150%
	13C3-PFHxS	70%		50-150%
	13C8-PFOS	76%		50-150%
	13C8-FOSA	83%		30-130%
	d3-MeFOSAA	91%		50-150%
	13C2-4:2FTS	71%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	86%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-92_060320		
Lab Sample ID:	FA75555-10	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22178.D	1	06/09/20 04:09	NG	06/05/20 10:00	OP80514	S3Q341
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-92_060320		
Lab Sample ID:	FA75555-10	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	71%		35-135%
	13C5-PFPeA	85%		50-150%
	13C5-PFHxA	91%		50-150%
	13C4-PFHpA	102%		50-150%
	13C8-PFOA	108%		50-150%
	13C9-PFNA	107%		50-150%
	13C6-PFDA	102%		50-150%
	13C7-PFUnDA	96%		40-140%
	13C2-PFDoDA	88%		40-140%
	13C2-PFTeDA	76%		30-130%
	13C3-PFBS	85%		50-150%
	13C3-PFHxS	99%		50-150%
	13C8-PFOS	98%		50-150%
	13C8-FOSA	97%		30-130%
	d3-MeFOSAA	96%		50-150%
	13C2-4:2FTS	94%		50-150%
	13C2-6:2FTS	109%		50-150%
	13C2-8:2FTS	102%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-107_060320		
Lab Sample ID:	FA75555-11	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22179.D	1	06/09/20 04:23	NG	06/05/20 10:00	OP80514	S3Q341
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0025	0.0069	0.0017	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0027	0.0034	0.0013	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0012	0.0034	0.00086	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0048	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0034	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0029	0.0034	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0030	0.0034	0.0013	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-107_060320		
Lab Sample ID:	FA75555-11	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	58%		35-135%
	13C5-PFPeA	72%		50-150%
	13C5-PFHxA	76%		50-150%
	13C4-PFHpA	86%		50-150%
	13C8-PFOA	97%		50-150%
	13C9-PFNA	104%		50-150%
	13C6-PFDA	101%		50-150%
	13C7-PFUnDA	92%		40-140%
	13C2-PFDoDA	81%		40-140%
	13C2-PFTeDA	68%		30-130%
	13C3-PFBS	73%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	93%		50-150%
	13C8-FOSA	48%		30-130%
	d3-MeFOSAA	91%		50-150%
	13C2-4:2FTS	81%		50-150%
	13C2-6:2FTS	107%		50-150%
	13C2-8:2FTS	102%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-111_060320		
Lab Sample ID:	FA75555-12	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22180.D	1	06/09/20 04:38	NG	06/05/20 10:00	OP80514	S3Q341
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0023	0.0069	0.0017	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0017	0.0034	0.00086	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0014	0.0034	0.00086	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0062	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0034	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0014	0.0034	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0014	0.0034	0.0013	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-111_060320		
Lab Sample ID:	FA75555-12	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/04/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%		35-135%
	13C5-PFPeA	76%		50-150%
	13C5-PFHxA	81%		50-150%
	13C4-PFHpA	92%		50-150%
	13C8-PFOA	98%		50-150%
	13C9-PFNA	97%		50-150%
	13C6-PFDA	91%		50-150%
	13C7-PFUnDA	86%		40-140%
	13C2-PFDoDA	83%		40-140%
	13C2-PFTeDA	79%		30-130%
	13C3-PFBS	76%		50-150%
	13C3-PFHxS	89%		50-150%
	13C8-PFOS	88%		50-150%
	13C8-FOSA	101%		30-130%
	d3-MeFOSAA	87%		50-150%
	13C2-4:2FTS	83%		50-150%
	13C2-6:2FTS	98%		50-150%
	13C2-8:2FTS	87%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

SGS Plant 3

SGS North America Inc - Orlando
Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

FA75555

SGS - ORLANDO JOB # : PAGE 1 OF 1

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis of Michigan, LLC
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Michael.Spacil@arcadis.com Email:
Phone #: 313-407-8332
Sampler(s) Name(s) (Printed)
Sampler 1: Austin Westhus Sampler 2: Dan Stockard

Project Information

Project Name: RACER Lansing Plant 3
Street: 2801 W. Saginaw Street
City: Lansing State: MI
Project #: 30042872.03700
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via Method 537 mod. with isotope dilution per QSM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	CONTAINER INFORMATION OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NAOH+ZNAC	DI WATER	MEOH	LAB USE ONLY
1	MW-18-102_060220	6/2/20	1125	AW	GW	2		2								X
2	MW-18-104_060220	6/2/20	1240	AW	GW	2		2								X
3	MW-18-106_060220	6/2/20	1345	AW	GW	2		2								X
4	MW-18-99_060220	6/2/20	1600	AW	GW	2		2								X
5	MW-18-96_060220	6/2/20	1720	AW	GW	1		1								X
6	FB-01_060320	6/3/20	0950	AW	GW	2		2								X
7	MW-18-98_060320	6/3/20	0955	AW	GW	2		2								X
8	MW-18-100_060320	6/3/20	1100	AW	GW	2		2								X
9	MW-19-108_060320 MS/MSD	6/3/20	1300	AW	GW	6		6								X
10	MW-18-92_060320	6/3/20	1355	AW	GW	2		2								X
11	MW-19-107_060320	6/3/20	1455	AW	GW	2		2								X
12	MW-19-111_060320	6/3/20		AW	GW	2		2								X

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other Standard

Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

☐ COMMERCIAL "A" (RESULTS ONLY)
☐ COMMERCIAL "B" (RESULTS PLUS QC)
☐ REDT1 (EPA LEVEL 3)
☐ FULLT1 (EPA LEVEL 4)
☒ EDD'S

INITIAL ASSESSMENT SP
LABEL VERIFICATION VR

Comments / Remarks

* Need all 24 analytes in EGLE list reported
* Limited Sample volume for: MW-18-96

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1 Austin Westhus / Arcadis	6/3/20 1800	2 FEDEX	3 FX		4 06/04/2020 945
Relinquished by/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
5		6	7		8

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 2.7

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

SGS Sample Receipt Summary

Job Number: FA75555 **Client:** ARCADIS **Project:** RACER LANSING PLANT 3

Date / Time Received: 6/4/2020 8:45:00 AM **Delivery Method:** FED EX **Airbill #'s:** 1002284310460003281100138665992771

Therm ID: IR 1; **Therm CF:** -0.8; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.5);

Cooler Temps (Corrected) °C: Cooler 1: (2.7);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☐		☑	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments SAMPLE #3 ID LABEL READS "MW-18-06_060220" @1345

SM001
Rev. Date 05/24/17

Technician: SHAYLAP Date: 6/4/2020 8:45:00 AM Reviewer: _____ Date: _____

FA75555: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-MB	3Q22161.D	1	06/08/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-1, FA75555-2, FA75555-3, FA75555-5, FA75555-7, FA75555-8, FA75555-10, FA75555-11, FA75555-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	83%	35-135%
	13C5-PFPeA	81%	50-150%
	13C5-PFHxA	82%	50-150%
	13C4-PFHpA	83%	50-150%
	13C8-PFOA	83%	50-150%
	13C9-PFNA	82%	50-150%
	13C6-PFDA	78%	50-150%
	13C7-PFUnDA	72%	40-140%

Method Blank Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-MB	3Q22161.D	1	06/08/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-1, FA75555-2, FA75555-3, FA75555-5, FA75555-7, FA75555-8, FA75555-10, FA75555-11, FA75555-12

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	68%	40-140%
	13C2-PFTeDA	65%	30-130%
	13C3-PFBS	82%	50-150%
	13C3-PFHxS	82%	50-150%
	13C8-PFOS	77%	50-150%
	13C8-FOSA	84%	30-130%
	d3-MeFOSAA	72%	50-150%
	13C2-4:2FTS	78%	50-150%
	13C2-6:2FTS	79%	50-150%
	13C2-8:2FTS	72%	50-150%

Method Blank Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-MB	3Q22425.D	1	06/11/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-4, FA75555-6, FA75555-9

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	118%	35-135%
	13C5-PFPeA	116%	50-150%
	13C5-PFHxA	115%	50-150%
	13C4-PFHpA	115%	50-150%
	13C8-PFOA	116%	50-150%
	13C9-PFNA	113%	50-150%
	13C6-PFDA	117%	50-150%
	13C7-PFUnDA	121%	40-140%

Method Blank Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-MB	3Q22425.D	1	06/11/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-4, FA75555-6, FA75555-9

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	114%	40-140%
	13C2-PFTeDA	104%	30-130%
	13C3-PFBS	110%	50-150%
	13C3-PFHxS	108%	50-150%
	13C8-PFOS	103%	50-150%
	13C8-FOSA	116%	30-130%
	d3-MeFOSAA	116%	50-150%
	13C2-4:2FTS	110%	50-150%
	13C2-6:2FTS	108%	50-150%
	13C2-8:2FTS	107%	50-150%

Instrument Blank

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q341-IBLK	3Q22119.D	1	06/08/20	NG	n/a	n/a	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75555-1, FA75555-2, FA75555-3, FA75555-5, FA75555-7, FA75555-8, FA75555-10, FA75555-11, FA75555-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	103%	50-150%
	13C5-PFPeA	104%	50-150%
	13C5-PFHxA	105%	50-150%
	13C4-PFHpA	106%	50-150%
	13C8-PFOA	107%	50-150%
	13C9-PFNA	106%	50-150%
	13C6-PFDA	107%	50-150%
	13C7-PFUnDA	107%	50-150%

Instrument Blank

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q341-IBLK	3Q22119.D	1	06/08/20	NG	n/a	n/a	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75555-1, FA75555-2, FA75555-3, FA75555-5, FA75555-7, FA75555-8, FA75555-10, FA75555-11, FA75555-12

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	107%	50-150%
	13C2-PFTeDA	106%	50-150%
	13C3-PFBS	104%	50-150%
	13C3-PFHxS	106%	50-150%
	13C8-PFOS	105%	50-150%
	13C8-FOSA	111%	50-150%
	d3-MeFOSAA	106%	50-150%
	13C2-4:2FTS	98%	50-150%
	13C2-6:2FTS	99%	50-150%
	13C2-8:2FTS	99%	50-150%

Instrument Blank

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q343-IBLK	3Q22397.D	1	06/11/20	NG	n/a	n/a	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75555-4, FA75555-6, FA75555-9

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	110%	50-150%
	13C5-PFPeA	112%	50-150%
	13C5-PFHxA	115%	50-150%
	13C4-PFHpA	115%	50-150%
	13C8-PFOA	118%	50-150%
	13C9-PFNA	117%	50-150%
	13C6-PFDA	123%	50-150%
	13C7-PFUnDA	127%	50-150%

Instrument Blank

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q343-IBLK	3Q22397.D	1	06/11/20	NG	n/a	n/a	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75555-4, FA75555-6, FA75555-9

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	124%	50-150%
	13C2-PFTeDA	116%	50-150%
	13C3-PFBS	96%	50-150%
	13C3-PFHxS	106%	50-150%
	13C8-PFOS	107%	50-150%
	13C8-FOSA	122%	50-150%
	d3-MeFOSAA	125%	50-150%
	13C2-4:2FTS	105%	50-150%
	13C2-6:2FTS	108%	50-150%
	13C2-8:2FTS	112%	50-150%

Blank Spike Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-BS	3Q22160.D	1	06/08/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-1, FA75555-2, FA75555-3, FA75555-5, FA75555-7, FA75555-8, FA75555-10, FA75555-11, FA75555-12

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0757	95	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0767	96	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0758	95	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0746	93	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0762	95	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0771	96	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0757	95	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0755	94	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0761	95	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0778	97	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0762	95	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0776	97	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0778	97	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0782	98	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0783	98	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0764	96	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0687	86	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0698	87	60-130
754-91-6	PFOSA	0.08	0.0750	94	70-130
2355-31-9	MeFOSAA	0.08	0.0778	97	70-130
2991-50-6	EtFOSAA	0.08	0.0738	92	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0752	94	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0747	93	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0772	97	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	101%	35-135%
	13C5-PFPeA	99%	50-150%
	13C5-PFHxA	99%	50-150%
	13C4-PFHpA	102%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	99%	50-150%
	13C6-PFDA	94%	50-150%
	13C7-PFUnDA	87%	40-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-BS	3Q22160.D	1	06/08/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-1, FA75555-2, FA75555-3, FA75555-5, FA75555-7, FA75555-8, FA75555-10, FA75555-11, FA75555-12

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	86%	40-140%
	13C2-PFTeDA	81%	30-130%
	13C3-PFBS	98%	50-150%
	13C3-PFHxS	99%	50-150%
	13C8-PFOS	95%	50-150%
	13C8-FOSA	98%	30-130%
	d3-MeFOSAA	89%	50-150%
	13C2-4:2FTS	100%	50-150%
	13C2-6:2FTS	102%	50-150%
	13C2-8:2FTS	93%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-BS	3Q22424.D	1	06/11/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-4, FA75555-6, FA75555-9

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0751	94	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0777	97	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0751	94	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0771	96	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0784	98	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0778	97	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0764	96	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0745	93	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0761	95	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0805	101	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0769	96	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0778	97	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0790	99	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0764	96	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0772	97	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0750	94	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0847	106	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0698	87	60-130
754-91-6	PFOSA	0.08	0.0761	95	70-130
2355-31-9	MeFOSAA	0.08	0.0774	97	70-130
2991-50-6	EtFOSAA	0.08	0.0774	97	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0767	96	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0733	92	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0769	96	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	105%	35-135%
	13C5-PFPeA	103%	50-150%
	13C5-PFHxA	103%	50-150%
	13C4-PFHpA	101%	50-150%
	13C8-PFOA	100%	50-150%
	13C9-PFNA	100%	50-150%
	13C6-PFDA	102%	50-150%
	13C7-PFUnDA	107%	40-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-BS	3Q22424.D	1	06/11/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-4, FA75555-6, FA75555-9

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	101%	40-140%
	13C2-PFTeDA	94%	30-130%
	13C3-PFBS	99%	50-150%
	13C3-PFHxS	97%	50-150%
	13C8-PFOS	92%	50-150%
	13C8-FOSA	99%	30-130%
	d3-MeFOSAA	100%	50-150%
	13C2-4:2FTS	101%	50-150%
	13C2-6:2FTS	99%	50-150%
	13C2-8:2FTS	99%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-MS	3Q22176.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341
OP80514-MSD	3Q22177.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341
FA75555-9 [a]	3Q22175.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-1, FA75555-2, FA75555-3, FA75555-5, FA75555-7, FA75555-8, FA75555-10, FA75555-11, FA75555-12

CAS No.	Compound	FA75555-9 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	ND		0.069	0.0681	99	0.069	0.0600	87	13	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.069	0.0703	102	0.069	0.0626	91	12	70-130/30
307-24-4	Perfluorohexanoic acid	0.0010	J	0.069	0.0693	99	0.069	0.0617	88	12	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.069	0.0676	98	0.069	0.0601	87	12	70-130/30
335-67-1	Perfluorooctanoic acid	0.0047		0.069	0.0748	102	0.069	0.0660	89	13	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.069	0.0691	100	0.069	0.0610	88	12	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.069	0.0703	102	0.069	0.0622	90	12	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.069	0.0696	101	0.069	0.0606	88	14	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.069	0.0698	101	0.069	0.0621	90	12	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.069	0.0701	102	0.069	0.0611	89	14	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.069	0.0724	105	0.069	0.0616	89	16	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0011	J	0.069	0.0710	101	0.069	0.0620	88	14	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.069	0.0730	106	0.069	0.0655	95	11	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.0018	J	0.069	0.0706	100	0.069	0.0634	89	11	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.069	0.0756	110	0.069	0.0668	97	12	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0333		0.069	0.0727	57*	0.069	0.0651	46*	11	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.069	0.0627	91	0.069	0.0578	84	8	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.069	0.0616	89	0.069	0.0543	79	13	60-130/30
754-91-6	PFOSA	ND		0.069	0.0655	95	0.069	0.0583	85	12	70-130/30
2355-31-9	MeFOSAA	ND		0.069	0.0697	101	0.069	0.0604	88	14	70-130/30
2991-50-6	EtFOSAA	ND		0.069	0.0699	101	0.069	0.0585	85	18	70-130/30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.069	0.0666	97	0.069	0.0600	87	10	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.069	0.0683	99	0.069	0.0620	90	10	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.069	0.0702	102	0.069	0.0622	90	12	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	FA75555-9	Limits
	13C4-PFBA	62%	72%		35-135%
	13C5-PFPeA	75%	86%		50-150%
	13C5-PFHxA	78%	90%		50-150%
	13C4-PFHpA	88%	102%		50-150%
	13C8-PFOA	95%	111%		50-150%
	13C9-PFNA	98%	115%		50-150%
	13C6-PFDA	92%	107%		50-150%
	13C7-PFUnDA	87%	103%		40-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80514-MS	3Q22176.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341
OP80514-MSD	3Q22177.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341
FA75555-9 [a]	3Q22175.D	1	06/09/20	NG	06/05/20	OP80514	S3Q341

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-1, FA75555-2, FA75555-3, FA75555-5, FA75555-7, FA75555-8, FA75555-10, FA75555-11, FA75555-12

CAS No.	ID Standard Recoveries	MS	MSD	FA75555-9	Limits
	13C2-PFDoDA	83%	99%		40-140%
	13C2-PFTeDA	80%	96%		30-130%
	13C3-PFBS	75%	87%		50-150%
	13C3-PFHxS	85%	99%		50-150%
	13C8-PFOS	91%	107%		50-150%
	13C8-FOSA	86%	106%		30-130%
	d3-MeFOSAA	84%	104%		50-150%
	13C2-4:2FTS	86%	99%		50-150%
	13C2-6:2FTS	106%	123%		50-150%
	13C2-8:2FTS	95%	111%		50-150%

(a) Sample used for QC purposes only.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-MS	3Q22436.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343
OP80580-MSD	3Q22437.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343
FA75555-9	3Q22435.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-4, FA75555-6, FA75555-9

CAS No.	Compound	FA75555-9 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	ND		0.0741	0.0708	96	0.0741	0.0699	94	1	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.0741	0.0741	100	0.0741	0.0738	100	0	70-130/30
307-24-4	Perfluorohexanoic acid	0.0012	J	0.0741	0.0716	95	0.0741	0.0711	94	1	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.0741	0.0730	99	0.0741	0.0718	97	2	70-130/30
335-67-1	Perfluorooctanoic acid	0.0057		0.0741	0.0788	99	0.0741	0.0794	99	1	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0741	0.0728	98	0.0741	0.0715	97	2	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0741	0.0704	95	0.0741	0.0690	93	2	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0741	0.0694	94	0.0741	0.0681	92	2	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0741	0.0711	96	0.0741	0.0700	95	2	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0741	0.0710	96	0.0741	0.0703	95	1	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0741	0.0718	97	0.0741	0.0709	96	1	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0013	J	0.0741	0.0723	96	0.0741	0.0717	95	1	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0741	0.0698	94	0.0741	0.0700	95	0	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0741	0.0724	98	0.0741	0.0704	95	3	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0741	0.0804	109	0.0741	0.0791	107	2	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0038		0.0741	0.0730	93	0.0741	0.0713	91	2	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0741	0.0832	112	0.0741	0.0811	109	3	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0741	0.0663	90	0.0741	0.0641	87	3	60-130/30
754-91-6	PFOSA	ND		0.0741	0.0706	95	0.0741	0.0700	95	1	70-130/30
2355-31-9	MeFOSAA	ND		0.0741	0.0721	97	0.0741	0.0705	95	2	70-130/30
2991-50-6	EtFOSAA	ND		0.0741	0.0717	97	0.0741	0.0704	95	2	70-130/30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0741	0.0711	96	0.0741	0.0701	95	1	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0741	0.0682	92	0.0741	0.0711	96	4	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0741	0.0696	94	0.0741	0.0710	96	2	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	FA75555-9	Limits
	13C4-PFBA	73%	67%	66%	35-135%
	13C5-PFPeA	83%	76%	74%	50-150%
	13C5-PFHxA	77%	70%	70%	50-150%
	13C4-PFHpA	82%	76%	75%	50-150%
	13C8-PFOA	93%	84%	85%	50-150%
	13C9-PFNA	100%	91%	88%	50-150%
	13C6-PFDA	105%	97%	93%	50-150%
	13C7-PFUnDA	113%	101%	100%	40-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75555
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80580-MS	3Q22436.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343
OP80580-MSD	3Q22437.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343
FA75555-9	3Q22435.D	1	06/12/20	NG	06/10/20	OP80580	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75555-4, FA75555-6, FA75555-9

CAS No.	ID Standard Recoveries	MS	MSD	FA75555-9	Limits
	13C2-PFDoDA	108%	100%	96%	40-140%
	13C2-PFTeDA	106%	97%	92%	30-130%
	13C3-PFBS	80%	73%	70%	50-150%
	13C3-PFHxS	77%	71%	70%	50-150%
	13C8-PFOS	87%	78%	76%	50-150%
	13C8-FOSA	92%	85%	83%	30-130%
	d3-MeFOSAA	102%	94%	91%	50-150%
	13C2-4:2FTS	83%	77%	71%	50-150%
	13C2-6:2FTS	100%	90%	86%	50-150%
	13C2-8:2FTS	105%	93%	86%	50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA75616

Sampling Dates: 06/03/20 - 06/04/20

Report to:

andrea.colby@sgs.com

Total number of pages in report: **48**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA75616

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
This report contains results reported as ND = Not detected. The following applies: Organics ND = Not detected above the MDL							
FA75616-1	06/03/20	11:00	JP	06/05/20	AQ	Ground Water	MW-04-06R_060320
FA75616-2	06/03/20	12:20	JP	06/05/20	AQ	Ground Water	MW-04-04R_060320
FA75616-3	06/03/20	00:00	JP	06/05/20	AQ	Ground Water	DUP-11_060320
FA75616-4	06/03/20	14:20	JP	06/05/20	AQ	Ground Water	MW-04-05(6)_060320
FA75616-5	06/03/20	15:35	JP	06/05/20	AQ	Ground Water	MW-12-12_060320
FA75616-6	06/03/20	16:10	JP	06/05/20	AQ	Ground Water	MW-14-70_060320
FA75616-7	06/04/20	09:25	JP	06/05/20	AQ	Ground Water	MW-12-13_060420
FA75616-8	06/04/20	00:00	JP	06/05/20	AQ	Ground Water	DUP-10_060420
FA75616-9	06/04/20	10:35	JP	06/05/20	AQ	Ground Water	MW-14-67_060420
FA75616-10	06/04/20	11:30	JP	06/05/20	AQ	Ground Water	MW-13-36R_060420
FA75616-11	06/04/20	12:55	JP	06/05/20	AQ	Ground Water	MW-12-11_060420
FA75616-12	06/04/20	14:30	JP	06/05/20	AQ	Ground Water	P6-SB-07_060420

Summary of Hits

Job Number: FA75616
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/03/20 thru 06/04/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA75616-1	**MW-04-06R_060320**					
Perfluorobutanoic acid		0.0028 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0018 J	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.00089 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0021 J	0.0036	0.0013	ug/l	EPA 537M BY ID
FA75616-2	**MW-04-04R_060320**					
No hits reported in this sample.						
FA75616-3	**DUP-11_060320**					
Perfluorooctanesulfonic acid		0.0013 J	0.0033	0.0012	ug/l	EPA 537M BY ID
FA75616-4	**MW-04-05(6)_060320**					
Perfluorobutanoic acid		0.0256	0.0067	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0400	0.0033	0.0012	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0473	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0285	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0239	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0014 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0010 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0011 J	0.0033	0.00083	ug/l	EPA 537M BY ID
FA75616-5	**MW-12-12_060320**					
Perfluorobutanoic acid		0.0363	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0598	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0703	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0318	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0609	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0078	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0102	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0011 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0012 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.00096 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0454	0.0034	0.0013	ug/l	EPA 537M BY ID
FA75616-6	**MW-14-70_060320**					
Perfluorobutanoic acid		0.0486	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.129	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0957	0.0034	0.00086	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA75616
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/03/20 thru 06/04/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluoroheptanoic acid		0.0620	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0428	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0060	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0024 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0013 J	0.0034	0.0013	ug/l	EPA 537M BY ID
FA75616-7	**MW-12-13_060420**					
Perfluorobutanoic acid		0.0347	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0424	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0564	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0137	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0013 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0014 J	0.0034	0.00086	ug/l	EPA 537M BY ID
FA75616-8	**DUP-10_060420**					
Perfluorobutanoic acid		0.0346	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0426	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0570	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0144	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0013 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0016 J	0.0034	0.00086	ug/l	EPA 537M BY ID
FA75616-9	**MW-14-67_060420**					
Perfluorobutanoic acid		0.0510	0.0067	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0755	0.0033	0.0012	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0816	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0281	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0107	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0020 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0012 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0036	0.0033	0.0012	ug/l	EPA 537M BY ID
FA75616-10	**MW-13-36R_060420**					
Perfluorobutanoic acid		0.0226	0.0067	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0279	0.0033	0.0012	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0274	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0345	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0669	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0116	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0203	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0045	0.0033	0.00083	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA75616
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/03/20 thru 06/04/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorohexanesulfonic acid		0.0015 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0467	0.0033	0.0012	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0012 J	0.0033	0.00083	ug/l	EPA 537M BY ID
PFOSA		0.0058	0.0033	0.00083	ug/l	EPA 537M BY ID
MeFOSAA		0.0036 J	0.0067	0.0033	ug/l	EPA 537M BY ID
EtFOSAA		0.0063 J	0.0067	0.0033	ug/l	EPA 537M BY ID
FA75616-11	**MW-12-11_060420**					
Perfluorobutanoic acid		0.0058 J	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0021 J	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.00087 J	0.0034	0.00086	ug/l	EPA 537M BY ID
FA75616-12	**P6-SB-07_060420**					
Perfluorobutanoic acid		0.254	0.0067	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.932	0.017	0.0063	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.885	0.017	0.0042	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.759	0.017	0.0042	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		1.04	0.017	0.0042	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0927	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0273	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0052	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0018 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0040	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0572	0.0033	0.0012	ug/l	EPA 537M BY ID

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-04-06R_060320		
Lab Sample ID:	FA75616-1	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q49944.D	1	06/10/20 17:19	NAF	06/09/20 15:30	OP80567	S2Q742
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0028	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0018	0.0036	0.0013	ug/l	J
307-24-4	Perfluorohexanoic acid	0.00089	0.0036	0.00089	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0021	0.0036	0.0013	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-04-06R_060320		
Lab Sample ID:	FA75616-1	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	72%		35-135%
	13C5-PFPeA	77%		50-150%
	13C5-PFHxA	82%		50-150%
	13C4-PFHpA	81%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	82%		50-150%
	13C6-PFDA	80%		50-150%
	13C7-PFUnDA	83%		40-140%
	13C2-PFDoDA	87%		40-140%
	13C2-PFTeDA	65%		30-130%
	13C3-PFBS	77%		50-150%
	13C3-PFHxS	80%		50-150%
	13C8-PFOS	72%		50-150%
	13C8-FOSA	77%		30-130%
	d3-MeFOSAA	75%		50-150%
	13C2-4:2FTS	78%		50-150%
	13C2-6:2FTS	83%		50-150%
	13C2-8:2FTS	73%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-04-04R_060320		
Lab Sample ID:	FA75616-2	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q49945.D	1	06/10/20 17:34	NAF	06/09/20 15:30	OP80567	S2Q742
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-04-04R_060320		
Lab Sample ID:	FA75616-2	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%		35-135%
	13C5-PFPeA	73%		50-150%
	13C5-PFHxA	76%		50-150%
	13C4-PFHpA	76%		50-150%
	13C8-PFOA	80%		50-150%
	13C9-PFNA	78%		50-150%
	13C6-PFDA	78%		50-150%
	13C7-PFUnDA	76%		40-140%
	13C2-PFDoDA	69%		40-140%
	13C2-PFTeDA	64%		30-130%
	13C3-PFBS	73%		50-150%
	13C3-PFHxS	76%		50-150%
	13C8-PFOS	73%		50-150%
	13C8-FOSA	79%		30-130%
	d3-MeFOSAA	76%		50-150%
	13C2-4:2FTS	72%		50-150%
	13C2-6:2FTS	75%		50-150%
	13C2-8:2FTS	72%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-11_060320		
Lab Sample ID:	FA75616-3	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q49946.D	1	06/10/20 17:49	NAF	06/09/20 15:30	OP80567	S2Q742
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0067	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0033	0.0012	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0033	0.00083	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0033	0.00083	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0033	0.00083	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0033	0.00083	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0033	0.00083	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0033	0.00083	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0033	0.0012	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0033	0.00083	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0033	0.00083	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0033	0.00083	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0033	0.00083	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0033	0.00083	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0013	0.0033	0.0012	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0033	0.00083	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0067	0.0033	ug/l	
2991-50-6	EtFOSAA	ND	0.0067	0.0033	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-11_060320		
Lab Sample ID:	FA75616-3	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%		35-135%
	13C5-PFPeA	73%		50-150%
	13C5-PFHxA	75%		50-150%
	13C4-PFHpA	74%		50-150%
	13C8-PFOA	80%		50-150%
	13C9-PFNA	76%		50-150%
	13C6-PFDA	73%		50-150%
	13C7-PFUnDA	75%		40-140%
	13C2-PFDoDA	76%		40-140%
	13C2-PFTeDA	65%		30-130%
	13C3-PFBS	72%		50-150%
	13C3-PFHxS	73%		50-150%
	13C8-PFOS	70%		50-150%
	13C8-FOSA	78%		30-130%
	d3-MeFOSAA	71%		50-150%
	13C2-4:2FTS	71%		50-150%
	13C2-6:2FTS	76%		50-150%
	13C2-8:2FTS	68%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-04-05(6)_060320		
Lab Sample ID:	FA75616-4	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q49947.D	1	06/10/20 18:04	NAF	06/09/20 15:30	OP80567	S2Q742
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0256	0.0067	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0400	0.0033	0.0012	ug/l	
307-24-4	Perfluorohexanoic acid	0.0473	0.0033	0.00083	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0285	0.0033	0.00083	ug/l	
335-67-1	Perfluorooctanoic acid	0.0239	0.0033	0.00083	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0033	0.00083	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0033	0.00083	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0033	0.00083	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0033	0.0012	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0033	0.00083	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0033	0.00083	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0010	0.0033	0.00083	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0033	0.00083	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0033	0.00083	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0033	0.0012	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0033	0.00083	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0067	0.0033	ug/l	
2991-50-6	EtFOSAA	ND	0.0067	0.0033	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-04-05(6)_060320		
Lab Sample ID:	FA75616-4	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	56%		35-135%
	13C5-PFPeA	59%		50-150%
	13C5-PFHxA	60%		50-150%
	13C4-PFHpA	60%		50-150%
	13C8-PFOA	70%		50-150%
	13C9-PFNA	75%		50-150%
	13C6-PFDA	79%		50-150%
	13C7-PFUnDA	77%		40-140%
	13C2-PFDoDA	78%		40-140%
	13C2-PFTeDA	69%		30-130%
	13C3-PFBS	61%		50-150%
	13C3-PFHxS	64%		50-150%
	13C8-PFOS	67%		50-150%
	13C8-FOSA	42%		30-130%
	d3-MeFOSAA	93%		50-150%
	13C2-4:2FTS	65%		50-150%
	13C2-6:2FTS	79%		50-150%
	13C2-8:2FTS	88%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-12_060320		
Lab Sample ID:	FA75616-5	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q49948.D	1	06/10/20 18:18	NAF	06/09/20 15:30	OP80567	S2Q742
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0363	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0598	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0703	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0318	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0609	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	0.0078	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	0.0102	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0011	0.0034	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0012	0.0034	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.00096	0.0034	0.00086	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0454	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-12_060320		
Lab Sample ID:	FA75616-5	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	67%		35-135%
	13C5-PFPeA	68%		50-150%
	13C5-PFHxA	69%		50-150%
	13C4-PFHpA	67%		50-150%
	13C8-PFOA	76%		50-150%
	13C9-PFNA	77%		50-150%
	13C6-PFDA	79%		50-150%
	13C7-PFUnDA	85%		40-140%
	13C2-PFDoDA	86%		40-140%
	13C2-PFTeDA	73%		30-130%
	13C3-PFBS	70%		50-150%
	13C3-PFHxS	70%		50-150%
	13C8-PFOS	71%		50-150%
	13C8-FOSA	47%		30-130%
	d3-MeFOSAA	94%		50-150%
	13C2-4:2FTS	72%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	86%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-70_060320		
Lab Sample ID:	FA75616-6	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q49949.D	1	06/10/20 18:33	NAF	06/09/20 15:30	OP80567	S2Q742
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0486	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.129	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0957	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0620	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0428	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0060	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0024	0.0034	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0013	0.0034	0.0013	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-70_060320		
Lab Sample ID:	FA75616-6	**Date Sampled:**	06/03/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%		35-135%
	13C5-PFPeA	59%		50-150%
	13C5-PFHxA	62%		50-150%
	13C4-PFHpA	63%		50-150%
	13C8-PFOA	74%		50-150%
	13C9-PFNA	80%		50-150%
	13C6-PFDA	82%		50-150%
	13C7-PFUnDA	79%		40-140%
	13C2-PFDoDA	81%		40-140%
	13C2-PFTeDA	69%		30-130%
	13C3-PFBS	63%		50-150%
	13C3-PFHxS	66%		50-150%
	13C8-PFOS	72%		50-150%
	13C8-FOSA	75%		30-130%
	d3-MeFOSAA	80%		50-150%
	13C2-4:2FTS	67%		50-150%
	13C2-6:2FTS	84%		50-150%
	13C2-8:2FTS	79%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-13_060420		
Lab Sample ID:	FA75616-7	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q49952.D	1	06/10/20 19:17	NAF	06/09/20 15:30	OP80567	S2Q742
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0347	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0424	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0564	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0137	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0013	0.0034	0.00086	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0034	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-13_060420		
Lab Sample ID:	FA75616-7	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	62%		35-135%
	13C5-PFPeA	64%		50-150%
	13C5-PFHxA	64%		50-150%
	13C4-PFHpA	63%		50-150%
	13C8-PFOA	73%		50-150%
	13C9-PFNA	76%		50-150%
	13C6-PFDA	74%		50-150%
	13C7-PFUnDA	69%		40-140%
	13C2-PFDoDA	71%		40-140%
	13C2-PFTeDA	64%		30-130%
	13C3-PFBS	64%		50-150%
	13C3-PFHxS	63%		50-150%
	13C8-PFOS	72%		50-150%
	13C8-FOSA	78%		30-130%
	d3-MeFOSAA	71%		50-150%
	13C2-4:2FTS	67%		50-150%
	13C2-6:2FTS	76%		50-150%
	13C2-8:2FTS	71%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-10_060420		
Lab Sample ID:	FA75616-8	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q49954.D	1	06/10/20 19:47	NAF	06/09/20 15:30	OP80567	S2Q742
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0346	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0426	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0570	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0144	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0013	0.0034	0.00086	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0016	0.0034	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-10_060420		
Lab Sample ID:	FA75616-8	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%		35-135%
	13C5-PFPeA	71%		50-150%
	13C5-PFHxA	72%		50-150%
	13C4-PFHpA	70%		50-150%
	13C8-PFOA	81%		50-150%
	13C9-PFNA	84%		50-150%
	13C6-PFDA	82%		50-150%
	13C7-PFUnDA	87%		40-140%
	13C2-PFDoDA	82%		40-140%
	13C2-PFTeDA	73%		30-130%
	13C3-PFBS	73%		50-150%
	13C3-PFHxS	71%		50-150%
	13C8-PFOS	80%		50-150%
	13C8-FOSA	88%		30-130%
	d3-MeFOSAA	81%		50-150%
	13C2-4:2FTS	75%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	79%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-67_060420		
Lab Sample ID:	FA75616-9	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q50014.D	1	06/11/20 13:26	NAF	06/09/20 15:30	OP80567	S2Q743
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0510	0.0067	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0755	0.0033	0.0012	ug/l	
307-24-4	Perfluorohexanoic acid	0.0816	0.0033	0.00083	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0281	0.0033	0.00083	ug/l	
335-67-1	Perfluorooctanoic acid	0.0107	0.0033	0.00083	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0033	0.00083	ug/l	
335-76-2	Perfluorodecanoic acid	0.0020	0.0033	0.00083	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0033	0.00083	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0033	0.0012	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0033	0.00083	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0012	0.0033	0.00083	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0033	0.00083	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0033	0.00083	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0033	0.00083	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0036	0.0033	0.0012	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0033	0.00083	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0067	0.0033	ug/l	
2991-50-6	EtFOSAA	ND	0.0067	0.0033	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-67_060420		
Lab Sample ID:	FA75616-9	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	49%		35-135%
	13C5-PFPeA	51%		50-150%
	13C5-PFHxA	51%		50-150%
	13C4-PFHpA	56%		50-150%
	13C8-PFOA	69%		50-150%
	13C9-PFNA	76%		50-150%
	13C6-PFDA	83%		50-150%
	13C7-PFUnDA	82%		40-140%
	13C2-PFDoDA	81%		40-140%
	13C2-PFTeDA	76%		30-130%
	13C3-PFBS	57%		50-150%
	13C3-PFHxS	63%		50-150%
	13C8-PFOS	69%		50-150%
	13C8-FOSA	61%		30-130%
	d3-MeFOSAA	88%		50-150%
	13C2-4:2FTS	58%		50-150%
	13C2-6:2FTS	79%		50-150%
	13C2-8:2FTS	84%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-13-36R_060420		
Lab Sample ID:	FA75616-10	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q49957.D	1	06/10/20 20:31	NAF	06/09/20 15:30	OP80567	S2Q742
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0226	0.0067	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0279	0.0033	0.0012	ug/l	
307-24-4	Perfluorohexanoic acid	0.0274	0.0033	0.00083	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0345	0.0033	0.00083	ug/l	
335-67-1	Perfluorooctanoic acid	0.0669	0.0033	0.00083	ug/l	
375-95-1	Perfluorononanoic acid	0.0116	0.0033	0.00083	ug/l	
335-76-2	Perfluorodecanoic acid	0.0203	0.0033	0.00083	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0033	0.00083	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0033	0.0012	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0033	0.00083	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0045	0.0033	0.00083	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0033	0.00083	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0015	0.0033	0.00083	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0033	0.00083	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0467	0.0033	0.0012	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0033	0.00083	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0012	0.0033	0.00083	ug/l	J
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	0.0058	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	0.0036	0.0067	0.0033	ug/l	J
2991-50-6	EtFOSAA	0.0063	0.0067	0.0033	ug/l	J
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-13-36R_060420		
Lab Sample ID:	FA75616-10	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	64%		35-135%
	13C5-PFPeA	65%		50-150%
	13C5-PFHxA	65%		50-150%
	13C4-PFHpA	64%		50-150%
	13C8-PFOA	71%		50-150%
	13C9-PFNA	71%		50-150%
	13C6-PFDA	70%		50-150%
	13C7-PFUnDA	67%		40-140%
	13C2-PFDoDA	69%		40-140%
	13C2-PFTeDA	66%		30-130%
	13C3-PFBS	68%		50-150%
	13C3-PFHxS	69%		50-150%
	13C8-PFOS	67%		50-150%
	13C8-FOSA	33%		30-130%
	d3-MeFOSAA	76%		50-150%
	13C2-4:2FTS	70%		50-150%
	13C2-6:2FTS	82%		50-150%
	13C2-8:2FTS	84%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-11_060420		
Lab Sample ID:	FA75616-11	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q49958.D	1	06/10/20 20:46	NAF	06/09/20 15:30	OP80567	S2Q742
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0058	0.0069	0.0017	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0021	0.0034	0.0013	ug/l	J
307-24-4	Perfluorohexanoic acid	0.00087	0.0034	0.00086	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-11_060420		
Lab Sample ID:	FA75616-11	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	71%		35-135%
	13C5-PFPeA	74%		50-150%
	13C5-PFHxA	77%		50-150%
	13C4-PFHpA	76%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	80%		50-150%
	13C6-PFDA	79%		50-150%
	13C7-PFUnDA	76%		40-140%
	13C2-PFDoDA	77%		40-140%
	13C2-PFTeDA	72%		30-130%
	13C3-PFBS	75%		50-150%
	13C3-PFHxS	77%		50-150%
	13C8-PFOS	76%		50-150%
	13C8-FOSA	82%		30-130%
	d3-MeFOSAA	76%		50-150%
	13C2-4:2FTS	75%		50-150%
	13C2-6:2FTS	79%		50-150%
	13C2-8:2FTS	75%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-SB-07_060420		
Lab Sample ID:	FA75616-12	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q49959.D	1	06/10/20 21:01	NAF	06/09/20 15:30	OP80567	S2Q742
Run #2	2Q50013.D	5	06/11/20 13:04	NAF	06/09/20 15:30	OP80567	S2Q743

	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2	300 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.254	0.0067	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.932 [a]	0.017	0.0063	ug/l	
307-24-4	Perfluorohexanoic acid	0.885 [a]	0.017	0.0042	ug/l	
375-85-9	Perfluoroheptanoic acid	0.759 [a]	0.017	0.0042	ug/l	
335-67-1	Perfluorooctanoic acid	1.04 [a]	0.017	0.0042	ug/l	
375-95-1	Perfluorononanoic acid	0.0927	0.0033	0.00083	ug/l	
335-76-2	Perfluorodecanoic acid	0.0273	0.0033	0.00083	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0033	0.00083	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0033	0.0012	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0033	0.00083	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0052	0.0033	0.00083	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0018	0.0033	0.00083	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0040	0.0033	0.00083	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0033	0.00083	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0572	0.0033	0.0012	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0033	0.00083	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0067	0.0033	ug/l	
2991-50-6	EtFOSAA	ND	0.0067	0.0033	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-SB-07_060420		
Lab Sample ID:	FA75616-12	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/05/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%	75%	35-135%
	13C5-PFPeA	61%	74%	50-150%
	13C5-PFHxA	61%	74%	50-150%
	13C4-PFHpA	61%	72%	50-150%
	13C8-PFOA	65%	78%	50-150%
	13C9-PFNA	71%	80%	50-150%
	13C6-PFDA	76%	82%	50-150%
	13C7-PFUnDA	78%	79%	40-140%
	13C2-PFDoDA	78%	78%	40-140%
	13C2-PFTeDA	70%	72%	30-130%
	13C3-PFBS	67%	77%	50-150%
	13C3-PFHxS	67%	77%	50-150%
	13C8-PFOS	67%	77%	50-150%
	13C8-FOSA	53%	85%	30-130%
	d3-MeFOSAA	82%	83%	50-150%
	13C2-4:2FTS	69%	78%	50-150%
	13C2-6:2FTS	69%	82%	50-150%
	13C2-8:2FTS	79%	81%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

Plant 6

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

FA75616

SGS - ORLANDO JOB # : PAGE 1 OF 1

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis of Michigan LLC
Address: 38550 Cabot Dr Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Mike Speil Email: Michael.speil@arcadis.com
Phone #: 313-407-8332
Sampler(s) Name(s) (Printed)
Sampler 1: Jake Pisarkiewicz Sampler 2:

Project Information

Project Name: Racer-Lansing - Plant 6
Street: 2801 W. Saginaw Street
City: Lansing State: MI
Project #: 30042872.03700
Fax #: 245 994 2241
Client Purchase Order #

Analytical Information

PFAS - Method 537 rev 1.1 w/isotope dilutions per ASTM

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	CONTAINER INFORMATION MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZnAA	DI WATER	MEOH	LAB USE ONLY
1	MW-04-06R-060320	6-3-20	1100	JJP	GW	2		X								
2	MW-04-04R_060320	6-3-20	1220	JJP	GW	2		X								
3	Dup-11	6-3-20	PM	JJP	GW	2		X								
4	MW-04-05(6)_060320	6-3-20	1420	JJP	GW	2		X								
5	MW-12-12-060320	6-3-20	1535	JJP	GW	2		X								
6	MW-14-70-060320	6-3-20	1610	JJP	GW	2		X								
7	MW-12-13_060420	6-4-20	0925	JJP	GW	2		X								
8	Dup-12	6-4-20	AM	JJP	GW	2		X								
9	MW-14-67_060420	6-4-20	1035	JJP	GW	2		X								
10	MW-13-36R_060420	6-4-20	1130	JJP	GW	2		X								
11	MW-12-11-060420	6-4-20	1255	JJP	GW	2		X								
12	P6-SB-07_060420	6-4-20	1430	JJP	GW	2		X								

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other Standard

Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [x] EDD'S

INITIAL VERIFICATION BG
LABEL VERIFICATION LR

Comments / Remarks

* Need all 24 analytes in EXCEL list reported
*

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1	Arcadis	6/4/20 1515	2 Arcadis	Arcadis	6/4/20 1600	4 FedEx
5	FX	Date Time:	6 06/05/2020 930	7	Date Time:	8

Lab Use Only: Cooler Temperature (s) Celsius (corrected): 3.4

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA75616: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA75616 **Client:** ARCADIS **Project:** RACER LANSING PLANT 6

Date / Time Received: 6/5/2020 9:30:00 AM **Delivery Method:** FED EX **Airbill #'s:** 1002284310610003281100138665992782

Therm ID: IR 1; **Therm CF:** -0.8; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (4.2);

Cooler Temps (Corrected) °C: Cooler 1: (3.4);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑
	W	**or**	**S**	**N/A**
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: SHAYLAP Date: 6/5/2020 9:30:00 AM Reviewer: _____ Date: _____

FA75616: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80567-MB	2Q49943.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75616-1, FA75616-2, FA75616-3, FA75616-4, FA75616-5, FA75616-6, FA75616-7, FA75616-8, FA75616-9, FA75616-10, FA75616-11, FA75616-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	66%	35-135%
	13C5-PFPeA	67%	50-150%
	13C5-PFHxA	69%	50-150%
	13C4-PFHpA	67%	50-150%
	13C8-PFOA	72%	50-150%
	13C9-PFNA	70%	50-150%
	13C6-PFDA	70%	50-150%
	13C7-PFUnDA	73%	40-140%

Method Blank Summary

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80567-MB	2Q49943.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75616-1, FA75616-2, FA75616-3, FA75616-4, FA75616-5, FA75616-6, FA75616-7, FA75616-8, FA75616-9, FA75616-10, FA75616-11, FA75616-12

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	63%	40-140%
	13C2-PFTeDA	59%	30-130%
	13C3-PFBS	66%	50-150%
	13C3-PFHxS	68%	50-150%
	13C8-PFOS	67%	50-150%
	13C8-FOSA	74%	30-130%
	d3-MeFOSAA	65%	50-150%
	13C2-4:2FTS	66%	50-150%
	13C2-6:2FTS	68%	50-150%
	13C2-8:2FTS	65%	50-150%

Instrument Blank

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q742-IBLK	2Q49916.D	1	06/10/20	NAF	n/a	n/a	S2Q742

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75616-1, FA75616-2, FA75616-3, FA75616-4, FA75616-5, FA75616-6, FA75616-7, FA75616-8, FA75616-10, FA75616-11, FA75616-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	88%	50-150%
	13C5-PFPeA	84%	50-150%
	13C5-PFHxA	86%	50-150%
	13C4-PFHpA	85%	50-150%
	13C8-PFOA	89%	50-150%
	13C9-PFNA	87%	50-150%
	13C6-PFDA	92%	50-150%
	13C7-PFUnDA	92%	50-150%

Instrument Blank

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q742-IBLK	2Q49916.D	1	06/10/20	NAF	n/a	n/a	S2Q742

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75616-1, FA75616-2, FA75616-3, FA75616-4, FA75616-5, FA75616-6, FA75616-7, FA75616-8, FA75616-10, FA75616-11, FA75616-12

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	90%	50-150%
	13C2-PFTeDA	87%	50-150%
	13C3-PFBS	87%	50-150%
	13C3-PFHxS	90%	50-150%
	13C8-PFOS	91%	50-150%
	13C8-FOSA	96%	50-150%
	d3-MeFOSAA	92%	50-150%
	13C2-4:2FTS	82%	50-150%
	13C2-6:2FTS	86%	50-150%
	13C2-8:2FTS	87%	50-150%

Instrument Blank

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q743-IBLK	2Q49994.D	1	06/11/20	NAF	n/a	n/a	S2Q743

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75616-9, FA75616-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	90%	50-150%
	13C5-PFPeA	86%	50-150%
	13C5-PFHxA	87%	50-150%
	13C4-PFHpA	86%	50-150%
	13C8-PFOA	93%	50-150%
	13C9-PFNA	90%	50-150%
	13C6-PFDA	94%	50-150%
	13C7-PFUnDA	95%	50-150%

Instrument Blank

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q743-IBLK	2Q49994.D	1	06/11/20	NAF	n/a	n/a	S2Q743

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75616-9, FA75616-12

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	97%	50-150%
	13C2-PFTeDA	92%	50-150%
	13C3-PFBS	90%	50-150%
	13C3-PFHxS	91%	50-150%
	13C8-PFOS	92%	50-150%
	13C8-FOSA	99%	50-150%
	d3-MeFOSAA	100%	50-150%
	13C2-4:2FTS	86%	50-150%
	13C2-6:2FTS	92%	50-150%
	13C2-8:2FTS	95%	50-150%

Blank Spike Summary

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80567-BS	2Q49942.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75616-1, FA75616-2, FA75616-3, FA75616-4, FA75616-5, FA75616-6, FA75616-7, FA75616-8, FA75616-9, FA75616-10, FA75616-11, FA75616-12

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0852	107	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0797	100	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0802	100	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0823	103	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0830	104	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0795	99	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0805	101	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0828	104	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0821	103	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0823	103	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0835	104	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0815	102	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0800	100	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0824	103	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0889	111	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0845	106	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0771	96	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0793	99	60-130
754-91-6	PFOSA	0.08	0.0818	102	70-130
2355-31-9	MeFOSAA	0.08	0.0828	104	70-130
2991-50-6	EtFOSAA	0.08	0.0780	98	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0825	103	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0808	101	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0789	99	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	74%	35-135%
	13C5-PFPeA	75%	50-150%
	13C5-PFHxA	77%	50-150%
	13C4-PFHpA	74%	50-150%
	13C8-PFOA	79%	50-150%
	13C9-PFNA	77%	50-150%
	13C6-PFDA	75%	50-150%
	13C7-PFUnDA	75%	40-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80567-BS	2Q49942.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75616-1, FA75616-2, FA75616-3, FA75616-4, FA75616-5, FA75616-6, FA75616-7, FA75616-8, FA75616-9, FA75616-10, FA75616-11, FA75616-12

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	80%	40-140%
	13C2-PFTeDA	66%	30-130%
	13C3-PFBS	73%	50-150%
	13C3-PFHxS	74%	50-150%
	13C8-PFOS	73%	50-150%
	13C8-FOSA	78%	30-130%
	d3-MeFOSAA	70%	50-150%
	13C2-4:2FTS	76%	50-150%
	13C2-6:2FTS	80%	50-150%
	13C2-8:2FTS	77%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80567-MS	2Q49953.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742
FA75616-7	2Q49952.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75616-1, FA75616-2, FA75616-3, FA75616-4, FA75616-5, FA75616-6, FA75616-7, FA75616-8, FA75616-9, FA75616-10, FA75616-11, FA75616-12

CAS No.	Compound	FA75616-7 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0347		0.069	0.108	106	70-130
2706-90-3	Perfluoropentanoic acid	0.0424		0.069	0.116	107	70-130
307-24-4	Perfluorohexanoic acid	0.0564		0.069	0.126	101	70-130
375-85-9	Perfluoroheptanoic acid	0.0137		0.069	0.0862	105	70-130
335-67-1	Perfluorooctanoic acid	0.0013	J	0.069	0.0733	104	70-130
375-95-1	Perfluorononanoic acid	ND		0.069	0.0698	101	70-130
335-76-2	Perfluorodecanoic acid	ND		0.069	0.0700	101	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.069	0.0714	104	70-130
307-55-1	Perfluorododecanoic acid	ND		0.069	0.0707	103	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.069	0.0745	108	65-130
376-06-7	Perfluorotetradecanoic acid	ND		0.069	0.0733	106	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0014	J	0.069	0.0717	102	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.069	0.0670	97	70-130
355-46-4	Perfluorohexanesulfonic acid	ND		0.069	0.0730	106	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.069	0.0797	116	70-130
1763-23-1	Perfluorooctanesulfonic acid	ND		0.069	0.0724	105	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.069	0.0682	99	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.069	0.0695	101	60-130
754-91-6	PFOSA	ND		0.069	0.0719	104	70-130
2355-31-9	MeFOSAA	ND		0.069	0.0702	102	70-130
2991-50-6	EtFOSAA	ND		0.069	0.0658	95	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.069	0.0718	104	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.069	0.0757	110	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.069	0.0700	101	70-130

CAS No.	ID Standard Recoveries	MS	FA75616-7	Limits
	13C4-PFBA	64%	62%	35-135%
	13C5-PFPeA	64%	64%	50-150%
	13C5-PFHxA	65%	64%	50-150%
	13C4-PFHpA	64%	63%	50-150%
	13C8-PFOA	73%	73%	50-150%
	13C9-PFNA	75%	76%	50-150%
	13C6-PFDA	73%	74%	50-150%
	13C7-PFUnDA	73%	69%	40-140%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80567-MS	2Q49953.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742
FA75616-7	2Q49952.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75616-1, FA75616-2, FA75616-3, FA75616-4, FA75616-5, FA75616-6, FA75616-7, FA75616-8, FA75616-9, FA75616-10, FA75616-11, FA75616-12

CAS No.	ID Standard Recoveries	MS	FA75616-7	Limits
	13C2-PFDoDA	76%	71%	40-140%
	13C2-PFTeDA	66%	64%	30-130%
	13C3-PFBS	66%	64%	50-150%
	13C3-PFHxS	64%	63%	50-150%
	13C8-PFOS	71%	72%	50-150%
	13C8-FOSA	75%	78%	30-130%
	d3-MeFOSAA	74%	71%	50-150%
	13C2-4:2FTS	71%	67%	50-150%
	13C2-6:2FTS	80%	76%	50-150%
	13C2-8:2FTS	77%	71%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80567-DUP	2Q49955.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742
FA75616-8	2Q49954.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75616-1, FA75616-2, FA75616-3, FA75616-4, FA75616-5, FA75616-6, FA75616-7, FA75616-8, FA75616-9, FA75616-10, FA75616-11, FA75616-12

CAS No.	Compound	FA75616-8 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.0346		0.0334		4	30
2706-90-3	Perfluoropentanoic acid	0.0426		0.0425		0	30
307-24-4	Perfluorohexanoic acid	0.0570		0.0558		2	30
375-85-9	Perfluoroheptanoic acid	0.0144		0.0140		3	30
335-67-1	Perfluorooctanoic acid	0.0013	J	0.0013	J	0	30
375-95-1	Perfluorononanoic acid	ND		ND		nc	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0016	J	0.0018	J	12	30
2706-91-4	Perfluoropentanesulfonic acid	ND		ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	ND		ND		nc	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	ND		ND		nc	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA75616-8	Limits
	13C4-PFBA	64%	70%	35-135%
	13C5-PFPeA	64%	71%	50-150%
	13C5-PFHxA	65%	72%	50-150%
	13C4-PFHpA	64%	70%	50-150%
	13C8-PFOA	73%	81%	50-150%
	13C9-PFNA	76%	84%	50-150%
	13C6-PFDA	73%	82%	50-150%
	13C7-PFUnDA	74%	87%	40-140%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA75616
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80567-DUP	2Q49955.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742
FA75616-8	2Q49954.D	1	06/10/20	NAF	06/09/20	OP80567	S2Q742

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75616-1, FA75616-2, FA75616-3, FA75616-4, FA75616-5, FA75616-6, FA75616-7, FA75616-8, FA75616-9, FA75616-10, FA75616-11, FA75616-12

CAS No.	ID Standard Recoveries	DUP	FA75616-8	Limits
	13C2-PFDoDA	70%	82%	40-140%
	13C2-PFTeDA	62%	73%	30-130%
	13C3-PFBS	65%	73%	50-150%
	13C3-PFHxS	65%	71%	50-150%
	13C8-PFOS	71%	80%	50-150%
	13C8-FOSA	79%	88%	30-130%
	d3-MeFOSAA	72%	81%	50-150%
	13C2-4:2FTS	67%	75%	50-150%
	13C2-6:2FTS	78%	86%	50-150%
	13C2-8:2FTS	73%	79%	50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

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Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA75678

Sampling Dates: 06/04/20 - 06/05/20

Report to:

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Total number of pages in report: 57

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA75678

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
This report contains results reported as ND = Not detected. The following applies: Organics ND = Not detected above the MDL							
FA75678-1	06/04/20	11:10	AWJF	06/06/20	AQ	Ground Water	MW-19-112_060420
FA75678-2	06/04/20	12:10	AWJF	06/06/20	AQ	Ground Water	MW-18-103_060420
FA75678-3	06/04/20	13:00	AWJF	06/06/20	AQ	Ground Water	MW-18-105_060420
FA75678-4	06/04/20	00:00	AWJF	06/06/20	AQ	Ground Water	DUP-07_060420
FA75678-5	06/04/20	14:20	AWJF	06/06/20	AQ	Ground Water	MW-19-114_060420
FA75678-6	06/04/20	15:30	AWJF	06/06/20	AQ	Ground Water	MW-18-88_060420
FA75678-7	06/04/20	00:00	AWJF	06/06/20	AQ	Ground Water	DUP-06_060420
FA75678-8	06/05/20	10:45	AWJF	06/06/20	AQ	Ground Water	MW-19-113_060520
FA75678-9	06/05/20	10:40	AWJF	06/06/20	AQ	Ground Water	UNK-15_060520
FA75678-10	06/05/20	11:10	AWJF	06/06/20	AQ	Equipment Blank	EB-01_060520
FA75678-11	06/05/20	12:05	AWJF	06/06/20	AQ	Ground Water	MW-18-91_060520
FA75678-12	06/05/20	12:45	AWJF	06/06/20	AQ	Ground Water	MW-18-93_060520

Sample Summary
(continued)

Arcadis

Job No: FA75678

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA75678-13	06/05/20	13:40	AWJF	06/06/20	AQ	Ground Water	MW-18-95_060520
FA75678-14	06/05/20	14:10	AWJF	06/06/20	AQ	Ground Water	MW-18-101_060520
FA75678-15	06/05/20	15:10	AWJF	06/06/20	AQ	Ground Water	MW-18-90_060520
FA75678-16	06/05/20	15:25	AWJF	06/06/20	AQ	Ground Water	MW-23_060520

Summary of Hits

Job Number: FA75678
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/04/20 thru 06/05/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA75678-1	**MW-19-112_060420**					
No hits reported in this sample.						
FA75678-2	**MW-18-103_060420**					
Perfluorobutanesulfonic acid		0.0022 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0022 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0174	0.0036	0.00089	ug/l	EPA 537M BY ID
FA75678-3	**MW-18-105_060420**					
Perfluorobutanoic acid		0.0021 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0012 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0038	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0013 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0089	0.0036	0.0013	ug/l	EPA 537M BY ID
FA75678-4	**DUP-07_060420**					
Perfluorobutanoic acid		0.0023 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0041	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0014 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0091	0.0036	0.0013	ug/l	EPA 537M BY ID
FA75678-5	**MW-19-114_060420**					
Perfluorooctanesulfonic acid		0.0019 J	0.0036	0.0013	ug/l	EPA 537M BY ID
FA75678-6	**MW-18-88_060420**					
Perfluorobutanoic acid		0.0064 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0041	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0019 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0019 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0013 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0782	0.0036	0.0013	ug/l	EPA 537M BY ID
FA75678-7	**DUP-06_060420**					
Perfluorobutanoic acid		0.0062 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0042	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0019 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0021 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0012 J	0.0036	0.00089	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA75678
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/04/20 thru 06/05/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorooctanesulfonic acid		0.0783	0.0036	0.0013	ug/l	EPA 537M BY ID
FA75678-8	**MW-19-113_060520**					
Perfluorobutanoic acid		0.0025 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0011 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0027 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0018 J	0.0036	0.0013	ug/l	EPA 537M BY ID
FA75678-9	**UNK-15_060520**					
Perfluorobutanoic acid		0.0151	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0173	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0140	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0111	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0331	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0047	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0021 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0017 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0018 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0127	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0160	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.913	0.036	0.013	ug/l	EPA 537M BY ID
Perfluorononanesulfonic acid		0.0020 J	0.0036	0.00089	ug/l	EPA 537M BY ID
FA75678-10	**EB-01_060520**					
No hits reported in this sample.						
FA75678-11	**MW-18-91_060520**					
Perfluorobutanoic acid		0.0075	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0049	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0035 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0028 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0082	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0015 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0010 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0014 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0017 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid [a]		0.0516	0.018	0.0067	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0046	0.0036	0.00089	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA75678
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/04/20 thru 06/05/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA75678-12	**MW-18-93_060520**					
No hits reported in this sample.						
FA75678-13	**MW-18-95_060520**					
Perfluorobutanoic acid		0.0076	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0037	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.00090 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0013 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0373	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0018 J	0.0036	0.00089	ug/l	EPA 537M BY ID
FA75678-14	**MW-18-101_060520**					
Perfluoropentanoic acid		0.0017 J	0.0040	0.0015	ug/l	EPA 537M BY ID
FA75678-15	**MW-18-90_060520**					
Perfluorobutanoic acid		0.0111	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0034 J	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0038	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0030 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0133	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0013 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0013 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0022 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0023 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0182	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0309	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.932	0.036	0.013	ug/l	EPA 537M BY ID
PFOSA		0.0011 J	0.0036	0.00089	ug/l	EPA 537M BY ID
FA75678-16	**MW-23_060520**					
No hits reported in this sample.						

(a) Dilution required due to matrix interference (ID recovery standard failure).

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-19-112_060420		
Lab Sample ID:	FA75678-1	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22402.D	1	06/11/20 17:46	NG	06/09/20 12:20	OP80569	S3Q343
Run #2 [a]	3Q22504.D	2	06/12/20 19:40	NG	06/09/20 12:20	OP80569	S3Q344

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND [b]	0.014	0.0036	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-112_060420		
Lab Sample ID:	FA75678-1	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	33% [c]	43%	35-135%
	13C5-PFPeA	51%	58%	50-150%
	13C5-PFHxA	51%	54%	50-150%
	13C4-PFHpA	58%	55%	50-150%
	13C8-PFOA	73%	60%	50-150%
	13C9-PFNA	97%	76%	50-150%
	13C6-PFDA	96%	78%	50-150%
	13C7-PFUnDA	113%	82%	40-140%
	13C2-PFDoDA	102%	83%	40-140%
	13C2-PFTeDA	85%	73%	30-130%
	13C3-PFBS	51%	60%	50-150%
	13C3-PFHxS	57%	55%	50-150%
	13C8-PFOS	76%	65%	50-150%
	13C8-FOSA	87%	71%	30-130%
	d3-MeFOSAA	91%	77%	50-150%
	13C2-4:2FTS	54%	52%	50-150%
	13C2-6:2FTS	79%	60%	50-150%
	13C2-8:2FTS	95%	76%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-103_060420		
Lab Sample ID:	FA75678-2	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22403.D	1	06/11/20 18:01	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0022	0.0036	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0022	0.0036	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0174	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-103_060420		
Lab Sample ID:	FA75678-2	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	91%		35-135%
	13C5-PFPeA	104%		50-150%
	13C5-PFHxA	107%		50-150%
	13C4-PFHpA	109%		50-150%
	13C8-PFOA	117%		50-150%
	13C9-PFNA	117%		50-150%
	13C6-PFDA	111%		50-150%
	13C7-PFUnDA	118%		40-140%
	13C2-PFDoDA	114%		40-140%
	13C2-PFTeDA	110%		30-130%
	13C3-PFBS	99%		50-150%
	13C3-PFHxS	100%		50-150%
	13C8-PFOS	92%		50-150%
	13C8-FOSA	114%		30-130%
	d3-MeFOSAA	106%		50-150%
	13C2-4:2FTS	100%		50-150%
	13C2-6:2FTS	108%		50-150%
	13C2-8:2FTS	100%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-105_060420		
Lab Sample ID:	FA75678-3	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22404.D	1	06/11/20 18:16	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0021	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0012	0.0036	0.00089	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0038	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0013	0.0036	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0089	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-105_060420		
Lab Sample ID:	FA75678-3	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	96%		35-135%
	13C5-PFPeA	107%		50-150%
	13C5-PFHxA	107%		50-150%
	13C4-PFHpA	111%		50-150%
	13C8-PFOA	120%		50-150%
	13C9-PFNA	129%		50-150%
	13C6-PFDA	120%		50-150%
	13C7-PFUnDA	130%		40-140%
	13C2-PFDoDA	130%		40-140%
	13C2-PFTeDA	121%		30-130%
	13C3-PFBS	101%		50-150%
	13C3-PFHxS	100%		50-150%
	13C8-PFOS	105%		50-150%
	13C8-FOSA	125%		30-130%
	d3-MeFOSAA	117%		50-150%
	13C2-4:2FTS	103%		50-150%
	13C2-6:2FTS	112%		50-150%
	13C2-8:2FTS	111%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-07_060420		
Lab Sample ID:	FA75678-4	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22405.D	1	06/11/20 18:31	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0023	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0041	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0014	0.0036	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0091	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-07_060420		
Lab Sample ID:	FA75678-4	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	85%		35-135%
	13C5-PFPeA	94%		50-150%
	13C5-PFHxA	94%		50-150%
	13C4-PFHpA	97%		50-150%
	13C8-PFOA	105%		50-150%
	13C9-PFNA	108%		50-150%
	13C6-PFDA	103%		50-150%
	13C7-PFUnDA	108%		40-140%
	13C2-PFDoDA	107%		40-140%
	13C2-PFTeDA	103%		30-130%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	88%		50-150%
	13C8-PFOS	88%		50-150%
	13C8-FOSA	106%		30-130%
	d3-MeFOSAA	98%		50-150%
	13C2-4:2FTS	91%		50-150%
	13C2-6:2FTS	98%		50-150%
	13C2-8:2FTS	96%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-114_060420		
Lab Sample ID:	FA75678-5	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22407.D	1	06/11/20 19:01	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0019	0.0036	0.0013	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-114_060420		
Lab Sample ID:	FA75678-5	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	96%		35-135%
	13C5-PFPeA	105%		50-150%
	13C5-PFHxA	108%		50-150%
	13C4-PFHpA	108%		50-150%
	13C8-PFOA	116%		50-150%
	13C9-PFNA	117%		50-150%
	13C6-PFDA	109%		50-150%
	13C7-PFUnDA	116%		40-140%
	13C2-PFDoDA	111%		40-140%
	13C2-PFTeDA	108%		30-130%
	13C3-PFBS	100%		50-150%
	13C3-PFHxS	99%		50-150%
	13C8-PFOS	95%		50-150%
	13C8-FOSA	114%		30-130%
	d3-MeFOSAA	106%		50-150%
	13C2-4:2FTS	101%		50-150%
	13C2-6:2FTS	106%		50-150%
	13C2-8:2FTS	102%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-88_060420		
Lab Sample ID:	FA75678-6	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22409.D	1	06/11/20 19:31	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0064	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0041	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0019	0.0036	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0019	0.0036	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.0013	0.0036	0.00089	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0782	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-88_060420		
Lab Sample ID:	FA75678-6	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	92%		35-135%
	13C5-PFPeA	99%		50-150%
	13C5-PFHxA	94%		50-150%
	13C4-PFHpA	95%		50-150%
	13C8-PFOA	105%		50-150%
	13C9-PFNA	111%		50-150%
	13C6-PFDA	106%		50-150%
	13C7-PFUnDA	114%		40-140%
	13C2-PFDoDA	113%		40-140%
	13C2-PFTeDA	110%		30-130%
	13C3-PFBS	93%		50-150%
	13C3-PFHxS	85%		50-150%
	13C8-PFOS	88%		50-150%
	13C8-FOSA	109%		30-130%
	d3-MeFOSAA	100%		50-150%
	13C2-4:2FTS	94%		50-150%
	13C2-6:2FTS	102%		50-150%
	13C2-8:2FTS	99%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-06_060420		
Lab Sample ID:	FA75678-7	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22412.D	1	06/11/20 20:16	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0062	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0042	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0019	0.0036	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0021	0.0036	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.0012	0.0036	0.00089	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0783	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-06_060420		
Lab Sample ID:	FA75678-7	**Date Sampled:**	06/04/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	90%		35-135%
	13C5-PFPeA	97%		50-150%
	13C5-PFHxA	92%		50-150%
	13C4-PFHpA	93%		50-150%
	13C8-PFOA	102%		50-150%
	13C9-PFNA	106%		50-150%
	13C6-PFDA	100%		50-150%
	13C7-PFUnDA	108%		40-140%
	13C2-PFDoDA	106%		40-140%
	13C2-PFTeDA	106%		30-130%
	13C3-PFBS	90%		50-150%
	13C3-PFHxS	84%		50-150%
	13C8-PFOS	83%		50-150%
	13C8-FOSA	102%		30-130%
	d3-MeFOSAA	96%		50-150%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	99%		50-150%
	13C2-8:2FTS	93%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-113_060520		
Lab Sample ID:	FA75678-8	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22413.D	1	06/11/20 20:31	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0025	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0011	0.0036	0.00089	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0027	0.0036	0.00089	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0018	0.0036	0.0013	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-113_060520		
Lab Sample ID:	FA75678-8	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	99%		35-135%
	13C5-PFPeA	102%		50-150%
	13C5-PFHxA	100%		50-150%
	13C4-PFHpA	99%		50-150%
	13C8-PFOA	105%		50-150%
	13C9-PFNA	98%		50-150%
	13C6-PFDA	105%		50-150%
	13C7-PFUnDA	107%		40-140%
	13C2-PFDoDA	105%		40-140%
	13C2-PFTeDA	100%		30-130%
	13C3-PFBS	98%		50-150%
	13C3-PFHxS	91%		50-150%
	13C8-PFOS	85%		50-150%
	13C8-FOSA	110%		30-130%
	d3-MeFOSAA	100%		50-150%
	13C2-4:2FTS	95%		50-150%
	13C2-6:2FTS	99%		50-150%
	13C2-8:2FTS	96%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNK-15_060520		
Lab Sample ID:	FA75678-9	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22414.D	1	06/11/20 20:45	NG	06/09/20 12:20	OP80569	S3Q343
Run #2	3Q22505.D	10	06/12/20 19:55	NG	06/09/20 12:20	OP80569	S3Q344

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0151	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0173	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0140	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0111	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0331	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0047	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0021	0.0036	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0017	0.0036	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0018	0.0036	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0127	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0160	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.913 [a]	0.036	0.013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0020	0.0036	0.00089	ug/l	J
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNK-15_060520		
Lab Sample ID:	FA75678-9	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	93%	105%	35-135%
	13C5-PFPeA	98%	106%	50-150%
	13C5-PFHxA	88%	102%	50-150%
	13C4-PFHpA	60%	89%	50-150%
	13C8-PFOA	82%	99%	50-150%
	13C9-PFNA	96%	98%	50-150%
	13C6-PFDA	107%	95%	50-150%
	13C7-PFUnDA	113%	91%	40-140%
	13C2-PFDoDA	110%	89%	40-140%
	13C2-PFTeDA	109%	91%	30-130%
	13C3-PFBS	92%	111%	50-150%
	13C3-PFHxS	68%	93%	50-150%
	13C8-PFOS	76%	93%	50-150%
	13C8-FOSA	95%	98%	30-130%
	d3-MeFOSAA	113%	89%	50-150%
	13C2-4:2FTS	91%	98%	50-150%
	13C2-6:2FTS	90%	95%	50-150%
	13C2-8:2FTS	113%	91%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-01_060520		
Lab Sample ID:	FA75678-10	**Date Sampled:**	06/05/20
Matrix:	AQ - Equipment Blank	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22415.D	1	06/11/20 21:00	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-01_060520		
Lab Sample ID:	FA75678-10	**Date Sampled:**	06/05/20
Matrix:	AQ - Equipment Blank	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	110%		35-135%
	13C5-PFPeA	111%		50-150%
	13C5-PFHxA	112%		50-150%
	13C4-PFHpA	111%		50-150%
	13C8-PFOA	115%		50-150%
	13C9-PFNA	115%		50-150%
	13C6-PFDA	108%		50-150%
	13C7-PFUnDA	119%		40-140%
	13C2-PFDoDA	112%		40-140%
	13C2-PFTeDA	105%		30-130%
	13C3-PFBS	106%		50-150%
	13C3-PFHxS	98%		50-150%
	13C8-PFOS	92%		50-150%
	13C8-FOSA	108%		30-130%
	d3-MeFOSAA	106%		50-150%
	13C2-4:2FTS	105%		50-150%
	13C2-6:2FTS	105%		50-150%
	13C2-8:2FTS	97%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-91_060520		
Lab Sample ID:	FA75678-11	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22416.D	1	06/11/20 21:15	NG	06/09/20 12:20	OP80569	S3Q343
Run #2 [a]	3Q22506.D	5	06/12/20 20:10	NG	06/09/20 12:20	OP80569	S3Q344

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0075	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0049	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0035	0.0036	0.00089	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0028	0.0036	0.00089	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0082	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0015	0.0036	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0010	0.0036	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0036	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0017	0.0036	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0516 [b]	0.018	0.0067	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND [b]	0.018	0.0045	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0046	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-91_060520		
Lab Sample ID:	FA75678-11	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	73%	87%	35-135%
	13C5-PFPeA	80%	90%	50-150%
	13C5-PFHxA	72%	82%	50-150%
	13C4-PFHpA	70%	74%	50-150%
	13C8-PFOA	67%	72%	50-150%
	13C9-PFNA	59%	73%	50-150%
	13C6-PFDA	62%	71%	50-150%
	13C7-PFUnDA	78%	69%	40-140%
	13C2-PFDoDA	82%	76%	40-140%
	13C2-PFTeDA	98%	84%	30-130%
	13C3-PFBS	77%	91%	50-150%
	13C3-PFHxS	65%	73%	50-150%
	13C8-PFOS	43% [c]	61%	50-150%
	13C8-FOSA	45%	69%	30-130%
	d3-MeFOSAA	76%	76%	50-150%
	13C2-4:2FTS	77%	79%	50-150%
	13C2-6:2FTS	76%	72%	50-150%
	13C2-8:2FTS	75%	71%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-93_060520		
Lab Sample ID:	FA75678-12	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22417.D	1	06/11/20 21:30	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-93_060520		
Lab Sample ID:	FA75678-12	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	104%		35-135%
	13C5-PFPeA	117%		50-150%
	13C5-PFHxA	119%		50-150%
	13C4-PFHpA	120%		50-150%
	13C8-PFOA	125%		50-150%
	13C9-PFNA	127%		50-150%
	13C6-PFDA	121%		50-150%
	13C7-PFUnDA	129%		40-140%
	13C2-PFDoDA	123%		40-140%
	13C2-PFTeDA	117%		30-130%
	13C3-PFBS	112%		50-150%
	13C3-PFHxS	109%		50-150%
	13C8-PFOS	103%		50-150%
	13C8-FOSA	125%		30-130%
	d3-MeFOSAA	115%		50-150%
	13C2-4:2FTS	113%		50-150%
	13C2-6:2FTS	116%		50-150%
	13C2-8:2FTS	109%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-95_060520		
Lab Sample ID:	FA75678-13	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22418.D	1	06/11/20 21:45	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0076	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0037	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.00090	0.0036	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0013	0.0036	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0373	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0018	0.0036	0.00089	ug/l	J
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-95_060520		
Lab Sample ID:	FA75678-13	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	86%		35-135%
	13C5-PFPeA	92%		50-150%
	13C5-PFHxA	84%		50-150%
	13C4-PFHpA	79%		50-150%
	13C8-PFOA	81%		50-150%
	13C9-PFNA	93%		50-150%
	13C6-PFDA	103%		50-150%
	13C7-PFUnDA	111%		40-140%
	13C2-PFDoDA	112%		40-140%
	13C2-PFTeDA	116%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	69%		50-150%
	13C8-FOSA	88%		30-130%
	d3-MeFOSAA	115%		50-150%
	13C2-4:2FTS	88%		50-150%
	13C2-6:2FTS	88%		50-150%
	13C2-8:2FTS	112%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-101_060520		
Lab Sample ID:	FA75678-14	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22419.D	1	06/11/20 22:00	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0017	0.0040	0.0015	ug/l	J
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-101_060520		
Lab Sample ID:	FA75678-14	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	91%		35-135%
	13C5-PFPeA	103%		50-150%
	13C5-PFHxA	106%		50-150%
	13C4-PFHpA	110%		50-150%
	13C8-PFOA	116%		50-150%
	13C9-PFNA	117%		50-150%
	13C6-PFDA	107%		50-150%
	13C7-PFUnDA	132%		40-140%
	13C2-PFDoDA	111%		40-140%
	13C2-PFTeDA	102%		30-130%
	13C3-PFBS	99%		50-150%
	13C3-PFHxS	101%		50-150%
	13C8-PFOS	93%		50-150%
	13C8-FOSA	113%		30-130%
	d3-MeFOSAA	104%		50-150%
	13C2-4:2FTS	102%		50-150%
	13C2-6:2FTS	108%		50-150%
	13C2-8:2FTS	97%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-90_060520		
Lab Sample ID:	FA75678-15	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22420.D	1	06/11/20 22:15	NG	06/09/20 12:20	OP80569	S3Q343
Run #2	3Q22507.D	10	06/12/20 20:25	NG	06/09/20 12:20	OP80569	S3Q344

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0111	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0034	0.0036	0.0013	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0038	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0030	0.0036	0.00089	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0133	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0013	0.0036	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0013	0.0036	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0022	0.0036	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0023	0.0036	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0182	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0309	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.932 [a]	0.036	0.013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	0.0011	0.0036	0.00089	ug/l	J
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-90_060520		
Lab Sample ID:	FA75678-15	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	97%	103%	35-135%
	13C5-PFPeA	99%	109%	50-150%
	13C5-PFHxA	93%	106%	50-150%
	13C4-PFHpA	88%	100%	50-150%
	13C8-PFOA	84%	98%	50-150%
	13C9-PFNA	89%	92%	50-150%
	13C6-PFDA	89%	84%	50-150%
	13C7-PFUnDA	96%	86%	40-140%
	13C2-PFDoDA	110%	92%	40-140%
	13C2-PFTeDA	121%	106%	30-130%
	13C3-PFBS	95%	109%	50-150%
	13C3-PFHxS	75%	92%	50-150%
	13C8-PFOS	67%	83%	50-150%
	13C8-FOSA	99%	96%	30-130%
	d3-MeFOSAA	101%	87%	50-150%
	13C2-4:2FTS	100%	104%	50-150%
	13C2-6:2FTS	94%	100%	50-150%
	13C2-8:2FTS	95%	82%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-23_060520		
Lab Sample ID:	FA75678-16	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22421.D	1	06/11/20 22:30	NG	06/09/20 12:20	OP80569	S3Q343
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-23_060520		
Lab Sample ID:	FA75678-16	**Date Sampled:**	06/05/20
Matrix:	AQ - Ground Water	**Date Received:**	06/06/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	102%		35-135%
	13C5-PFPeA	108%		50-150%
	13C5-PFHxA	110%		50-150%
	13C4-PFHpA	111%		50-150%
	13C8-PFOA	118%		50-150%
	13C9-PFNA	121%		50-150%
	13C6-PFDA	113%		50-150%
	13C7-PFUnDA	125%		40-140%
	13C2-PFDoDA	121%		40-140%
	13C2-PFTeDA	116%		30-130%
	13C3-PFBS	101%		50-150%
	13C3-PFHxS	100%		50-150%
	13C8-PFOS	96%		50-150%
	13C8-FOSA	113%		30-130%
	d3-MeFOSAA	113%		50-150%
	13C2-4:2FTS	107%		50-150%
	13C2-6:2FTS	108%		50-150%
	13C2-8:2FTS	105%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

FA75678

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # :

PAGE 1 OF 2

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis of Michigan, LLC
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Michael.Spaci@arcadis.com Email:
Phone #: 313-407-8332
Sampler(s) Name(s) (Printed)
Sampler 1: Austin Westhu Sampler 2: Jessica Fransted

Project Information

Project Name: RACER Lansing Plant 3
Street: 2801 W. Saginaw Street
City: Lansing State: MI
Project #: 30042872.03700
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via Method 537 mod with isotope dilution per QSM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZnAc	DI WATER	MEOH	LAB USE ONLY
1	MW-19-112_060420	6/4/20	1110	AW	GW	2		2								
2	MW-18-103_060420	6/4/20	1210	AW	GW	2		2								
3	MW-18-105_060420	6/4/20	1300	AW	GW	2		2								
4	Dup-07_060420	6/4/20	—	AW	GW	2		2								
5	MW-19-114_060420	6/4/20	1420	AW	GW	2		2								
6	MW-18-88_060420	6/4/20	1530	AW	GW	2		2								
7	Dup-06_060420	6/4/20	—	AW	GW	2		2								
8	MW-19-113_060520	6/5/20	1045	AW	GW	2		2								
9	UNK-15_060520	6/5/20	1040	JF	GW	2		2								
10	EB-01_060520	6/5/20	1110	AW	GW	2		2								
11	MW-18-91_060520	6/5/20	1205	JF	GW	2		2								
12	MW-18-93_060520	6/5/20	1245	AW	GW	2		2								

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other Standard

Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [x] EDD'S

Comments / Remarks

*Need all 24 analytes in EGLE list reported

SAMPLE VERIFICATION JK
LABEL VERIFICATION SP

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
AWestWuL/Arcadis	6/5/20 1690	2 FedEX	3 FF		4 [signature] 6/6/20 930
Relinquished by/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
5		6	7		8

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 2.5

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA75678

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # :

PAGE 2 OF 2

SGS - ORLANDO Quote #

SKIFF #

Client / Reporting Information

Company Name: Arcadis of Michigan, LLC
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Michael.SpaciI@arcadis.com Email:
Phone #: 313-407-8332
Sampler(s) Name(s) (Printed)
Sampler 1: Austin Westhuis Sampler 2: Jessica Fransted

Project Information

Project Name: RACER Lansing Plant 3
Street: 2801 W. Saginaw Street
City: Lansing State: MI
Project #: 30042872.03700
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via Method 537 mod with isotope dilution per QSM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	CONTAINER INFORMATION OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZNAC	DI WATER	MEOH	PFAS via Method 537 mod with isotope dilution per QSM 5.1	LAB USE ONLY
13	MW-18-95_060520	6/5/20	1340	JF	GW	2		2								X	
14	MW-18-101_060520	6/5/20	1410	AW	GW	2		2								X	
15	MW-18-90_060520	6/5/20	1510	JF	GW	2		2								X	
16	MW-23_060520	6/5/20	1525	AW	GW	2		2								X	

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other Standard

Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [x] EDD'S

Comments / Remarks

* Need all 24 analytes in EGLE list reported

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1	Arcadis	6/5/20 1630	2 FedEx	3 FX		4 6/6/20 930
5	Relinquished by/Affiliation	Date Time:	6 Received By/Affiliation	7 Relinquished By/Affiliation	Date Time:	8 Received By/Affiliation

Lab Use Only: Cooler Temperature (s) Celsius (corrected):

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

SGS Sample Receipt Summary

Job Number: FA75678 **Client:** ARCADIS MICHIGAN **Project:** RACER LANSING

Date / Time Received: 6/6/2020 9:30:00 AM **Delivery Method:** FX **Airbill #'s:** 1386 6599 2808

Therm ID: IR 1; **Therm CF:** -0.8; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.3);

Cooler Temps (Corrected) °C: Cooler 1: (2.5);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: PETERH Date: 6/6/2020 9:30:00 AM Reviewer: _____ Date: _____

FA75678: Chain of Custody
Page 3 of 3

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80569-MB	3Q22401.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75678-1, FA75678-2, FA75678-3, FA75678-4, FA75678-5, FA75678-6, FA75678-7, FA75678-8, FA75678-9, FA75678-10, FA75678-11, FA75678-12, FA75678-13, FA75678-14, FA75678-15, FA75678-16

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	112%	35-135%
	13C5-PFPeA	114%	50-150%
	13C5-PFHxA	117%	50-150%
	13C4-PFHpA	116%	50-150%
	13C8-PFOA	122%	50-150%
	13C9-PFNA	123%	50-150%
	13C6-PFDA	115%	50-150%
	13C7-PFUnDA	121%	40-140%

Method Blank Summary

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80569-MB	3Q22401.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75678-1, FA75678-2, FA75678-3, FA75678-4, FA75678-5, FA75678-6, FA75678-7, FA75678-8, FA75678-9, FA75678-10, FA75678-11, FA75678-12, FA75678-13, FA75678-14, FA75678-15, FA75678-16

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	114%	40-140%
	13C2-PFTeDA	105%	30-130%
	13C3-PFBS	107%	50-150%
	13C3-PFHxS	104%	50-150%
	13C8-PFOS	99%	50-150%
	13C8-FOSA	117%	30-130%
	d3-MeFOSAA	117%	50-150%
	13C2-4:2FTS	109%	50-150%
	13C2-6:2FTS	111%	50-150%
	13C2-8:2FTS	104%	50-150%

Instrument Blank

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q343-IBLK	3Q22397.D	1	06/11/20	NG	n/a	n/a	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75678-1, FA75678-2, FA75678-3, FA75678-4, FA75678-5, FA75678-6, FA75678-7, FA75678-8, FA75678-9, FA75678-10, FA75678-11, FA75678-12, FA75678-13, FA75678-14, FA75678-15, FA75678-16

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	110%	50-150%
	13C5-PFPeA	112%	50-150%
	13C5-PFHxA	115%	50-150%
	13C4-PFHpA	115%	50-150%
	13C8-PFOA	118%	50-150%
	13C9-PFNA	117%	50-150%
	13C6-PFDA	123%	50-150%
	13C7-PFUnDA	127%	50-150%

Instrument Blank

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q343-IBLK	3Q22397.D	1	06/11/20	NG	n/a	n/a	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75678-1, FA75678-2, FA75678-3, FA75678-4, FA75678-5, FA75678-6, FA75678-7, FA75678-8, FA75678-9, FA75678-10, FA75678-11, FA75678-12, FA75678-13, FA75678-14, FA75678-15, FA75678-16

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	124%	50-150%
	13C2-PFTeDA	116%	50-150%
	13C3-PFBS	96%	50-150%
	13C3-PFHxS	106%	50-150%
	13C8-PFOS	107%	50-150%
	13C8-FOSA	122%	50-150%
	d3-MeFOSAA	125%	50-150%
	13C2-4:2FTS	105%	50-150%
	13C2-6:2FTS	108%	50-150%
	13C2-8:2FTS	112%	50-150%

Instrument Blank

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q344-IBLK	3Q22480.D	1	06/12/20	NG	n/a	n/a	S3Q344

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75678-1, FA75678-9, FA75678-11, FA75678-15

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	73%	50-150%
	13C5-PFPeA	73%	50-150%
	13C5-PFHxA	74%	50-150%
	13C4-PFHpA	74%	50-150%
	13C8-PFOA	76%	50-150%
	13C9-PFNA	76%	50-150%
	13C6-PFDA	76%	50-150%
	13C7-PFUnDA	76%	50-150%
	13C2-PFDoDA	75%	50-150%
	13C2-PFTeDA	74%	50-150%
	13C3-PFBS	73%	50-150%
	13C3-PFHxS	73%	50-150%
	13C8-PFOS	74%	50-150%
	13C8-FOSA	81%	50-150%
	d3-MeFOSAA	77%	50-150%
	13C2-4:2FTS	69%	50-150%
	13C2-6:2FTS	71%	50-150%
	13C2-8:2FTS	70%	50-150%

Blank Spike Summary

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80569-BS	3Q22400.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75678-1, FA75678-2, FA75678-3, FA75678-4, FA75678-5, FA75678-6, FA75678-7, FA75678-8, FA75678-9, FA75678-10, FA75678-11, FA75678-12, FA75678-13, FA75678-14, FA75678-15, FA75678-16

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0725	91	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0716	90	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0720	90	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0721	90	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0729	91	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0722	90	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0728	91	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0726	91	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0722	90	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0914	114	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0730	91	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0720	90	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0738	92	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0706	88	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0713	89	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0739	92	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0785	98	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0616	77	60-130
754-91-6	PFOSA	0.08	0.0717	90	70-130
2355-31-9	MeFOSAA	0.08	0.0701	88	70-130
2991-50-6	EtFOSAA	0.08	0.0707	88	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0725	91	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0699	87	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0709	89	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	118%	35-135%
	13C5-PFPeA	120%	50-150%
	13C5-PFHxA	122%	50-150%
	13C4-PFHpA	121%	50-150%
	13C8-PFOA	126%	50-150%
	13C9-PFNA	124%	50-150%
	13C6-PFDA	114%	50-150%
	13C7-PFUnDA	123%	40-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80569-BS	3Q22400.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75678-1, FA75678-2, FA75678-3, FA75678-4, FA75678-5, FA75678-6, FA75678-7, FA75678-8, FA75678-9, FA75678-10, FA75678-11, FA75678-12, FA75678-13, FA75678-14, FA75678-15, FA75678-16

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	121%	40-140%
	13C2-PFTeDA	111%	30-130%
	13C3-PFBS	113%	50-150%
	13C3-PFHxS	111%	50-150%
	13C8-PFOS	102%	50-150%
	13C8-FOSA	117%	30-130%
	d3-MeFOSAA	118%	50-150%
	13C2-4:2FTS	121%	50-150%
	13C2-6:2FTS	121%	50-150%
	13C2-8:2FTS	112%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80569-MS	3Q22406.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343
FA75678-4	3Q22405.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75678-1, FA75678-2, FA75678-3, FA75678-4, FA75678-5, FA75678-6, FA75678-7, FA75678-8, FA75678-9, FA75678-10, FA75678-11, FA75678-12, FA75678-13, FA75678-14, FA75678-15, FA75678-16

CAS No.	Compound	FA75678-4 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0023	J	0.0714	0.0622	84	70-130
2706-90-3	Perfluoropentanoic acid	ND		0.0714	0.0601	84	70-130
307-24-4	Perfluorohexanoic acid	ND		0.0714	0.0609	85	70-130
375-85-9	Perfluoroheptanoic acid	ND		0.0714	0.0602	84	70-130
335-67-1	Perfluorooctanoic acid	ND		0.0714	0.0618	87	70-130
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0602	84	70-130
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0612	86	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0600	84	70-130
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0602	84	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0655	92	65-130
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0611	86	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0041		0.0714	0.0642	84	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0632	88	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0014	J	0.0714	0.0598	82	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0659	92	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0091		0.0714	0.0697	85	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0643	90	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0523	73	60-130
754-91-6	PFOSA	ND		0.0714	0.0610	85	70-130
2355-31-9	MeFOSAA	ND		0.0714	0.0587	82	70-130
2991-50-6	EtFOSAA	ND		0.0714	0.0576	81	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0714	0.0614	86	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0587	82	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0593	83	70-130

CAS No.	ID Standard Recoveries	MS	FA75678-4	Limits
	13C4-PFBA	88%	85%	35-135%
	13C5-PFPeA	98%	94%	50-150%
	13C5-PFHxA	98%	94%	50-150%
	13C4-PFHpA	101%	97%	50-150%
	13C8-PFOA	109%	105%	50-150%
	13C9-PFNA	117%	108%	50-150%
	13C6-PFDA	108%	103%	50-150%
	13C7-PFUnDA	116%	108%	40-140%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80569-MS	3Q22406.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343
FA75678-4	3Q22405.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75678-1, FA75678-2, FA75678-3, FA75678-4, FA75678-5, FA75678-6, FA75678-7, FA75678-8, FA75678-9, FA75678-10, FA75678-11, FA75678-12, FA75678-13, FA75678-14, FA75678-15, FA75678-16

CAS No.	ID Standard Recoveries	MS	FA75678-4	Limits
	13C2-PFDoDA	114%	107%	40-140%
	13C2-PFTeDA	107%	103%	30-130%
	13C3-PFBS	93%	89%	50-150%
	13C3-PFHxS	95%	88%	50-150%
	13C8-PFOS	97%	88%	50-150%
	13C8-FOSA	114%	106%	30-130%
	d3-MeFOSAA	106%	98%	50-150%
	13C2-4:2FTS	99%	91%	50-150%
	13C2-6:2FTS	107%	98%	50-150%
	13C2-8:2FTS	110%	96%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80569-DUP	3Q22408.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343
FA75678-5	3Q22407.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75678-1, FA75678-2, FA75678-3, FA75678-4, FA75678-5, FA75678-6, FA75678-7, FA75678-8, FA75678-9, FA75678-10, FA75678-11, FA75678-12, FA75678-13, FA75678-14, FA75678-15, FA75678-16

CAS No.	Compound	FA75678-5 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	ND		ND		nc	30
2706-90-3	Perfluoropentanoic acid	ND		ND		nc	30
307-24-4	Perfluorohexanoic acid	ND		ND		nc	30
375-85-9	Perfluoroheptanoic acid	ND		ND		nc	30
335-67-1	Perfluorooctanoic acid	ND		ND		nc	30
375-95-1	Perfluorononanoic acid	ND		ND		nc	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	ND		ND		nc	30
2706-91-4	Perfluoropentanesulfonic acid	ND		ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	ND		ND		nc	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0019	J	0.0020	J	5	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA75678-5	Limits
	13C4-PFBA	94%	96%	35-135%
	13C5-PFPeA	103%	105%	50-150%
	13C5-PFHxA	105%	108%	50-150%
	13C4-PFHpA	107%	108%	50-150%
	13C8-PFOA	115%	116%	50-150%
	13C9-PFNA	119%	117%	50-150%
	13C6-PFDA	112%	109%	50-150%
	13C7-PFUnDA	117%	116%	40-140%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA75678
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80569-DUP	3Q22408.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343
FA75678-5	3Q22407.D	1	06/11/20	NG	06/09/20	OP80569	S3Q343

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75678-1, FA75678-2, FA75678-3, FA75678-4, FA75678-5, FA75678-6, FA75678-7, FA75678-8, FA75678-9, FA75678-10, FA75678-11, FA75678-12, FA75678-13, FA75678-14, FA75678-15, FA75678-16

CAS No.	ID Standard Recoveries	DUP	FA75678-5	Limits
	13C2-PFDoDA	111%	111%	40-140%
	13C2-PFTeDA	106%	108%	30-130%
	13C3-PFBS	99%	100%	50-150%
	13C3-PFHxS	98%	99%	50-150%
	13C8-PFOS	97%	95%	50-150%
	13C8-FOSA	115%	114%	30-130%
	d3-MeFOSAA	107%	106%	50-150%
	13C2-4:2FTS	100%	101%	50-150%
	13C2-6:2FTS	105%	106%	50-150%
	13C2-8:2FTS	105%	102%	50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA75788

Sampling Dates: 06/08/20 - 06/09/20

Report to:

andrea.colby@sgs.com

Total number of pages in report: 49

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

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Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA75788

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA75788-1	06/08/20	15:15	AWJP	06/10/20	AQ	Ground Water	MW-14-56_060820
FA75788-2	06/08/20	11:35	AWJP	06/10/20	AQ	Ground Water	MW-12-18_060820
FA75788-3	06/08/20	13:00	AWJP	06/10/20	AQ	Ground Water	MW-12-09_060820
FA75788-4	06/09/20	10:00	AWJP	06/10/20	AQ	Ground Water	MW-14-62_060920
FA75788-5	06/09/20	11:15	AWJP	06/10/20	AQ	Ground Water	MW-14-59_060920
FA75788-6	06/09/20	00:00	AWJP	06/10/20	AQ	Ground Water	DUP-01_060920
FA75788-7	06/09/20	13:10	AWJP	06/10/20	AQ	Ground Water	MW-14-60_060920
FA75788-8	06/09/20	12:00	AWJP	06/10/20	AQ	Ground Water	MW-16-81_060920
FA75788-9	06/09/20	14:25	AWJP	06/10/20	AQ	Ground Water	MW-14-58_060920
FA75788-10	06/09/20	14:10	AWJP	06/10/20	AQ	Ground Water	P2-MW-02_060920

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

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Summary of Hits

Job Number: FA75788
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/08/20 thru 06/09/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA75788-1	**MW-14-56_060820**					
Perfluorobutanoic acid		0.0043 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0054	0.0036	0.0013	ug/l	EPA 537M BY ID
FA75788-2	**MW-12-18_060820**					
Perfluorobutanoic acid		0.0036 J	0.0071	0.0018	ug/l	EPA 537M BY ID
FA75788-3	**MW-12-09_060820**					
Perfluorobutanoic acid		0.0060 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0033 J	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0046	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0045	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0126	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0016 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0019 J	0.0036	0.00089	ug/l	EPA 537M BY ID
FA75788-4	**MW-14-62_060920**					
Perfluoropentanoic acid		0.0098	0.0033	0.0012	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0125	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0131	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0365	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0051	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0017 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0014 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0047	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.00094 J	0.0033	0.00083	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0502	0.0033	0.0012	ug/l	EPA 537M BY ID
PFOSA		0.0031 J	0.0033	0.00083	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		0.0134	0.0067	0.0017	ug/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		0.0042 J	0.0067	0.0017	ug/l	EPA 537M BY ID
FA75788-5	**MW-14-59_060920**					
Perfluorobutanoic acid		0.0066 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0027 J	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0032 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0021 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0067	0.0036	0.00089	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA75788
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/08/20 thru 06/09/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA75788-6	**DUP-01_060920**					
Perfluorobutanoic acid		0.0064 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0026 J	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0030 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0019 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0068	0.0036	0.00089	ug/l	EPA 537M BY ID
FA75788-7	**MW-14-60_060920**					
Perfluorobutanoic acid		0.0096	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0081	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid [a]		0.0347 J	0.036	0.0089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid [a]		0.0197 J	0.036	0.0089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0027 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0010 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0132	0.0036	0.0013	ug/l	EPA 537M BY ID
FA75788-8	**MW-16-81_060920**					
Perfluorobutanoic acid		0.0029 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0076	0.0036	0.0013	ug/l	EPA 537M BY ID
FA75788-9	**MW-14-58_060920**					
Perfluorobutanoic acid		0.0062 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0055	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0045	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0029 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0071	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0011 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0014 J	0.0036	0.00089	ug/l	EPA 537M BY ID
FA75788-10	**P2-MW-02_060920**					
Perfluorobutanoic acid		0.0034 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0012 J	0.0036	0.00089	ug/l	EPA 537M BY ID

(a) Dilution required due to matrix interference (ID recovery standard failure).

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-14-56_060820		
Lab Sample ID:	FA75788-1	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22719.D	1	06/15/20 18:55	NG	06/12/20 08:00	OP80631	S3Q346
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0043	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0054	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-56_060820		
Lab Sample ID:	FA75788-1	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	77%		35-135%
	13C5-PFPeA	81%		50-150%
	13C5-PFHxA	82%		50-150%
	13C4-PFHpA	86%		50-150%
	13C8-PFOA	92%		50-150%
	13C9-PFNA	90%		50-150%
	13C6-PFDA	83%		50-150%
	13C7-PFUnDA	75%		40-140%
	13C2-PFDoDA	79%		40-140%
	13C2-PFTeDA	75%		30-130%
	13C3-PFBS	80%		50-150%
	13C3-PFHxS	80%		50-150%
	13C8-PFOS	79%		50-150%
	13C8-FOSA	89%		30-130%
	d3-MeFOSAA	86%		50-150%
	13C2-4:2FTS	79%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	74%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-18_060820		
Lab Sample ID:	FA75788-2	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22720.D	1	06/15/20 19:10	NG	06/12/20 08:00	OP80631	S3Q346
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0036	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-18_060820		
Lab Sample ID:	FA75788-2	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	79%		35-135%
	13C5-PFPeA	84%		50-150%
	13C5-PFHxA	81%		50-150%
	13C4-PFHpA	81%		50-150%
	13C8-PFOA	88%		50-150%
	13C9-PFNA	90%		50-150%
	13C6-PFDA	88%		50-150%
	13C7-PFUnDA	78%		40-140%
	13C2-PFDoDA	80%		40-140%
	13C2-PFTeDA	75%		30-130%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	77%		50-150%
	13C8-PFOS	79%		50-150%
	13C8-FOSA	91%		30-130%
	d3-MeFOSAA	88%		50-150%
	13C2-4:2FTS	77%		50-150%
	13C2-6:2FTS	83%		50-150%
	13C2-8:2FTS	80%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-09_060820		
Lab Sample ID:	FA75788-3	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22721.D	1	06/15/20 19:25	NG	06/12/20 08:00	OP80631	S3Q346
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0060	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0033	0.0036	0.0013	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0046	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0045	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0126	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0016	0.0036	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0019	0.0036	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-09_060820		
Lab Sample ID:	FA75788-3	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	86%		35-135%
	13C5-PFPeA	87%		50-150%
	13C5-PFHxA	80%		50-150%
	13C4-PFHpA	76%		50-150%
	13C8-PFOA	81%		50-150%
	13C9-PFNA	85%		50-150%
	13C6-PFDA	85%		50-150%
	13C7-PFUnDA	78%		40-140%
	13C2-PFDoDA	78%		40-140%
	13C2-PFTeDA	66%		30-130%
	13C3-PFBS	84%		50-150%
	13C3-PFHxS	72%		50-150%
	13C8-PFOS	73%		50-150%
	13C8-FOSA	81%		30-130%
	d3-MeFOSAA	86%		50-150%
	13C2-4:2FTS	78%		50-150%
	13C2-6:2FTS	78%		50-150%
	13C2-8:2FTS	78%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-62_060920		
Lab Sample ID:	FA75788-4	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q50378.D	1	06/18/20 15:41	NAF	06/17/20 14:30	OP80727	S2Q747
Run #2							

	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
2706-90-3	Perfluoropentanoic acid	0.0098	0.0033	0.0012	ug/l	
307-24-4	Perfluorohexanoic acid	0.0125	0.0033	0.00083	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0131	0.0033	0.00083	ug/l	
335-67-1	Perfluorooctanoic acid	0.0365	0.0033	0.00083	ug/l	
375-95-1	Perfluorononanoic acid	0.0051	0.0033	0.00083	ug/l	
335-76-2	Perfluorodecanoic acid	0.0017	0.0033	0.00083	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0033	0.00083	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0033	0.0012	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0033	0.00083	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0033	0.00083	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0033	0.00083	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0047	0.0033	0.00083	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.00094	0.0033	0.00083	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0502	0.0033	0.0012	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0033	0.00083	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0033	0.00083	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	0.0031	0.0033	0.00083	ug/l	J
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0067	0.0033	ug/l	
2991-50-6	EtFOSAA	ND	0.0067	0.0033	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0067	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0134	0.0067	0.0017	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.0042	0.0067	0.0017	ug/l	J

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-62_060920		
Lab Sample ID:	FA75788-4	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	11% [a]		35-135%
	13C5-PFPeA	94%		50-150%
	13C5-PFHxA	97%		50-150%
	13C4-PFHpA	93%		50-150%
	13C8-PFOA	99%		50-150%
	13C9-PFNA	97%		50-150%
	13C6-PFDA	93%		50-150%
	13C7-PFUnDA	83%		40-140%
	13C2-PFDoDA	88%		40-140%
	13C2-PFTeDA	91%		30-130%
	13C3-PFBS	97%		50-150%
	13C3-PFHxS	91%		50-150%
	13C8-PFOS	89%		50-150%
	13C8-FOSA	64%		30-130%
	d3-MeFOSAA	116%		50-150%
	13C2-4:2FTS	100%		50-150%
	13C2-6:2FTS	113%		50-150%
	13C2-8:2FTS	111%		50-150%

(a) Outside control limits.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-59_060920		
Lab Sample ID:	FA75788-5	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22723.D	1	06/15/20 19:55	NG	06/12/20 08:00	OP80631	S3Q346
Run #2 [a]	3Q22771.D	5	06/16/20 08:19	NG	06/12/20 08:00	OP80631	S3Q346

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0066	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0027	0.0036	0.0013	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0032	0.0036	0.00089	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0021	0.0036	0.00089	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0067	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND [b]	0.018	0.0067	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND [b]	0.018	0.0045	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.018	0.0045	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-59_060920		
Lab Sample ID:	FA75788-5	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	67%	85%	35-135%
	13C5-PFPeA	71%	86%	50-150%
	13C5-PFHxA	65%	79%	50-150%
	13C4-PFHpA	61%	74%	50-150%
	13C8-PFOA	61%	77%	50-150%
	13C9-PFNA	53%	81%	50-150%
	13C6-PFDA	58%	80%	50-150%
	13C7-PFUnDA	62%	69%	40-140%
	13C2-PFDoDA	56%	57%	40-140%
	13C2-PFTeDA	43%	47%	30-130%
	13C3-PFBS	71%	87%	50-150%
	13C3-PFHxS	60%	71%	50-150%
	13C8-PFOS	41% [c]	67%	50-150%
	13C8-FOSA	29% [c]	62%	30-130%
	d3-MeFOSAA	67%	79%	50-150%
	13C2-4:2FTS	66%	79%	50-150%
	13C2-6:2FTS	64%	77%	50-150%
	13C2-8:2FTS	60%	75%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-01_060920		
Lab Sample ID:	FA75788-6	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22724.D	1	06/15/20 20:10	NG	06/12/20 08:00	OP80631	S3Q346
Run #2 [a]	3Q22772.D	5	06/16/20 08:34	NG	06/12/20 08:00	OP80631	S3Q346

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0064	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0026	0.0036	0.0013	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0030	0.0036	0.00089	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0019	0.0036	0.00089	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0068	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND [b]	0.018	0.0067	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND [b]	0.018	0.0045	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-01_060920		
Lab Sample ID:	FA75788-6	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%	71%	35-135%
	13C5-PFPeA	75%	71%	50-150%
	13C5-PFHxA	68%	66%	50-150%
	13C4-PFHpA	64%	64%	50-150%
	13C8-PFOA	63%	63%	50-150%
	13C9-PFNA	55%	65%	50-150%
	13C6-PFDA	58%	64%	50-150%
	13C7-PFUnDA	70%	60%	40-140%
	13C2-PFDoDA	71%	57%	40-140%
	13C2-PFTeDA	49%	48%	30-130%
	13C3-PFBS	75%	71%	50-150%
	13C3-PFHxS	63%	62%	50-150%
	13C8-PFOS	41% [c]	56%	50-150%
	13C8-FOSA	33%	55%	30-130%
	d3-MeFOSAA	71%	67%	50-150%
	13C2-4:2FTS	69%	67%	50-150%
	13C2-6:2FTS	67%	64%	50-150%
	13C2-8:2FTS	60%	57%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-60_060920		
Lab Sample ID:	FA75788-7	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22725.D	1	06/15/20 20:25	NG	06/12/20 08:00	OP80631	S3Q346
Run #2 [a]	3Q22773.D	10	06/16/20 08:49	NG	06/12/20 08:00	OP80631	S3Q346

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0096	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0081	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0347 [b]	0.036	0.0089	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND [b]	0.036	0.0089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0197 [b]	0.036	0.0089	ug/l	J
375-95-1	Perfluorononanoic acid	0.0027	0.0036	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0010	0.0036	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0132	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.036	0.0089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND [b]	0.071	0.018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND [b]	0.071	0.018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-60_060920		
Lab Sample ID:	FA75788-7	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	50%	77%	35-135%
	13C5-PFPeA	56%	79%	50-150%
	13C5-PFHxA	46% [c]	71%	50-150%
	13C4-PFHpA	44% [c]	65%	50-150%
	13C8-PFOA	0% [c]	62%	50-150%
	13C9-PFNA	52%	73%	50-150%
	13C6-PFDA	62%	56%	50-150%
	13C7-PFUnDA	58%	64%	40-140%
	13C2-PFDoDA	50%	66%	40-140%
	13C2-PFTeDA	49%	53%	30-130%
	13C3-PFBS	63%	81%	50-150%
	13C3-PFHxS	54%	63%	50-150%
	13C8-PFOS	60%	73%	50-150%
	13C8-FOSA	16% [c]	38%	30-130%
	d3-MeFOSAA	72%	71%	50-150%
	13C2-4:2FTS	48% [c]	74%	50-150%
	13C2-6:2FTS	0% [c]	69%	50-150%
	13C2-8:2FTS	80%	56%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-16-81_060920		
Lab Sample ID:	FA75788-8	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22726.D	1	06/15/20 20:41	NG	06/12/20 08:00	OP80631	S3Q346
Run #2 [a]	3Q22774.D	5	06/16/20 09:04	NG	06/12/20 08:00	OP80631	S3Q346

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0029	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0076	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND [b]	0.018	0.0045	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND [b]	0.036	0.0089	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-16-81_060920		
Lab Sample ID:	FA75788-8	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	41%	69%	35-135%
	13C5-PFPeA	50%	74%	50-150%
	13C5-PFHxA	45% [c]	67%	50-150%
	13C4-PFHpA	52%	64%	50-150%
	13C8-PFOA	59%	63%	50-150%
	13C9-PFNA	61%	82%	50-150%
	13C6-PFDA	76%	91%	50-150%
	13C7-PFUnDA	72%	80%	40-140%
	13C2-PFDoDA	61%	67%	40-140%
	13C2-PFTeDA	34%	50%	30-130%
	13C3-PFBS	55%	76%	50-150%
	13C3-PFHxS	56%	64%	50-150%
	13C8-PFOS	51%	68%	50-150%
	13C8-FOSA	31%	58%	30-130%
	d3-MeFOSAA	77%	84%	50-150%
	13C2-4:2FTS	46% [c]	70%	50-150%
	13C2-6:2FTS	66%	66%	50-150%
	13C2-8:2FTS	74%	80%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-58_060920		
Lab Sample ID:	FA75788-9	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22729.D	1	06/15/20 21:26	NG	06/12/20 08:00	OP80631	S3Q346
Run #2 [a]	3Q22775.D	5	06/16/20 09:19	NG	06/12/20 08:00	OP80631	S3Q346

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0062	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0055	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0045	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0029	0.0036	0.00089	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0071	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0011	0.0036	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0014	0.0036	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND [b]	0.018	0.0067	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND [b]	0.018	0.0045	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-58_060920		
Lab Sample ID:	FA75788-9	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%	74%	35-135%
	13C5-PFPeA	62%	77%	50-150%
	13C5-PFHxA	56%	72%	50-150%
	13C4-PFHpA	54%	71%	50-150%
	13C8-PFOA	55%	76%	50-150%
	13C9-PFNA	61%	79%	50-150%
	13C6-PFDA	69%	77%	50-150%
	13C7-PFUnDA	64%	67%	40-140%
	13C2-PFDoDA	63%	62%	40-140%
	13C2-PFTeDA	56%	57%	30-130%
	13C3-PFBS	62%	77%	50-150%
	13C3-PFHxS	53%	68%	50-150%
	13C8-PFOS	48% [c]	69%	50-150%
	13C8-FOSA	39%	53%	30-130%
	d3-MeFOSAA	67%	72%	50-150%
	13C2-4:2FTS	57%	71%	50-150%
	13C2-6:2FTS	57%	74%	50-150%
	13C2-8:2FTS	67%	70%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MW-02_060920		
Lab Sample ID:	FA75788-10	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22730.D	1	06/15/20 21:41	NG	06/12/20 08:00	OP80631	S3Q346
Run #2 [a]	3Q22776.D	5	06/16/20 09:34	NG	06/12/20 08:00	OP80631	S3Q346

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0034	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0012	0.0036	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND [b]	0.018	0.0067	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND [b]	0.018	0.0045	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P2-MW-02_060920		
Lab Sample ID:	FA75788-10	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	75%	72%	35-135%
	13C5-PFPeA	77%	71%	50-150%
	13C5-PFHxA	67%	66%	50-150%
	13C4-PFHpA	62%	64%	50-150%
	13C8-PFOA	62%	64%	50-150%
	13C9-PFNA	56%	67%	50-150%
	13C6-PFDA	55%	68%	50-150%
	13C7-PFUnDA	80%	66%	40-140%
	13C2-PFDoDA	80%	58%	40-140%
	13C2-PFTeDA	63%	45%	30-130%
	13C3-PFBS	77%	70%	50-150%
	13C3-PFHxS	61%	61%	50-150%
	13C8-PFOS	44% [c]	57%	50-150%
	13C8-FOSA	31%	53%	30-130%
	d3-MeFOSAA	77%	71%	50-150%
	13C2-4:2FTS	69%	67%	50-150%
	13C2-6:2FTS	67%	65%	50-150%
	13C2-8:2FTS	61%	65%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

FA75788

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS Plant 2

SGS - ORLANDO JOB # : PAGE 1 OF 1

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis of Michigan, LLC
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Michael.Spacil@arcadis.com Email:
Phone #: 313-407-8332
Sampler(s) Name(s) (Printed) Sampler 1: Austin Westhuis Sampler 2:

Project Information

Project Name: RACER Lansing Plant 2
Street: 2801 W. Saginaw Street
City: Lansing State: MI
Project #: 30042872.03706
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via Method 537 mod. per TA Scope of Work per 6/9/20 5:

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	CONTAINER INFORMATION OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NAOH+ZNAC	DI WATER	MEOH	PFAS	LAB USE ONLY
1	MW-14-56_060820	6/8/20	1515	AW	GW	2		2								X	
2	MW-12-18_060820	6/8/20	1135	JJP	GW	2		2								X	
3	MW-12-09_060820	6/8/20	1300	JJP	GW	2		2								X	
4	MW-14-62-060920	6/9/20	1000	JJP	GW	2		2								X	
5	MW-14-59-060920	6/9/20	1115	JJP	GW	2		2								X	
6	Dup-01	6/9/20	AM	JJP	GW	2		2								X	
7	MW-14-60-060920	6/9/20	1310	JJP	GW	2		2								X	
8	MW-16-81_060920	6/9/20	1200	AW	GW	1		1								X	
9	MW-14-58_060920	6/9/20	1425	JP	GW	2		2								X	
10	A2-MW-02-060920	6/9/20	1410	AW	GW	2		2								X	

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other Standard

Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [x] EDD'S

Comments / Remarks

* Need all 24 analytes in EGLE list reported

INITIAL ACCESSMENT AG

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1 Arcadis	6/9/20	2 FF	3 FX		4 6/10/20 930
Relinquished by/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
5		6	7		8

Lab Use Only: Cooler Temperature (s) Celsius (corrected): 1.5 3.0

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

SGS Sample Receipt Summary

Job Number: FA75788 **Client:** ARCADIS OF MICHIGAN **Project:** RACER LANSING PLANT 2

Date / Time Received: 6/10/2020 9:30:00 AM **Delivery Method:** FX **Airbill #'s:**

Therm ID: IR 1; **Therm CF:** -0.8; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (2.3);

Cooler Temps (Corrected) °C: Cooler 1: (1.5);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: PETERH Date: 6/10/2020 9:30:00 AM Reviewer: _____ Date: _____

FA75788: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MB	3Q22718.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-1, FA75788-2, FA75788-3, FA75788-4, FA75788-5, FA75788-6, FA75788-7, FA75788-8, FA75788-9, FA75788-10

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	94%	35-135%
	13C5-PFPeA	93%	50-150%
	13C5-PFHxA	95%	50-150%
	13C4-PFHpA	95%	50-150%
	13C8-PFOA	97%	50-150%
	13C9-PFNA	96%	50-150%
	13C6-PFDA	93%	50-150%
	13C7-PFUnDA	85%	40-140%

Method Blank Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MB	3Q22718.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-1, FA75788-2, FA75788-3, FA75788-4, FA75788-5, FA75788-6, FA75788-7, FA75788-8, FA75788-9, FA75788-10

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	75%	30-130%
	13C3-PFBS	92%	50-150%
	13C3-PFHxS	90%	50-150%
	13C8-PFOS	87%	50-150%
	13C8-FOSA	89%	30-130%
	d3-MeFOSAA	98%	50-150%
	13C2-4:2FTS	89%	50-150%
	13C2-6:2FTS	89%	50-150%
	13C2-8:2FTS	85%	50-150%

Method Blank Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80727-MB	2Q50377.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-4

CAS No.	Compound	Result	RL	MDL	Units	Q
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	89%	35-135%
	13C5-PFPeA	92%	50-150%
	13C5-PFHxA	95%	50-150%
	13C4-PFHpA	92%	50-150%
	13C8-PFOA	100%	50-150%
	13C9-PFNA	100%	50-150%
	13C6-PFDA	97%	50-150%
	13C7-PFUnDA	97%	40-140%
	13C2-PFDoDA	98%	40-140%

Method Blank Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80727-MB	2Q50377.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-4

CAS No.	ID Standard Recoveries		Limits
	13C2-PFTeDA	83%	30-130%
	13C3-PFBS	89%	50-150%
	13C3-PFHxS	91%	50-150%
	13C8-PFOS	93%	50-150%
	13C8-FOSA	86%	30-130%
	d3-MeFOSAA	100%	50-150%
	13C2-4:2FTS	89%	50-150%
	13C2-6:2FTS	94%	50-150%
	13C2-8:2FTS	95%	50-150%

Instrument Blank

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q346-IBLK	3Q22688.D	1	06/15/20	NG	n/a	n/a	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75788-1, FA75788-2, FA75788-3, FA75788-4, FA75788-5, FA75788-6, FA75788-7, FA75788-8, FA75788-9, FA75788-10

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	105%	50-150%
	13C5-PFPeA	102%	50-150%
	13C5-PFHxA	102%	50-150%
	13C4-PFHpA	104%	50-150%
	13C8-PFOA	106%	50-150%
	13C9-PFNA	105%	50-150%
	13C6-PFDA	105%	50-150%
	13C7-PFUnDA	105%	50-150%

Instrument Blank

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q346-IBLK	3Q22688.D	1	06/15/20	NG	n/a	n/a	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75788-1, FA75788-2, FA75788-3, FA75788-4, FA75788-5, FA75788-6, FA75788-7, FA75788-8, FA75788-9, FA75788-10

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	106%	50-150%
	13C2-PFTeDA	109%	50-150%
	13C3-PFBS	103%	50-150%
	13C3-PFHxS	101%	50-150%
	13C8-PFOS	99%	50-150%
	13C8-FOSA	111%	50-150%
	d3-MeFOSAA	110%	50-150%
	13C2-4:2FTS	96%	50-150%
	13C2-6:2FTS	97%	50-150%
	13C2-8:2FTS	91%	50-150%

Instrument Blank

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q747-IBLK	2Q50343.D	1	06/18/20	NAF	n/a	n/a	S2Q747

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75788-4

CAS No.	Compound	Result	RL	MDL	Units	Q
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	101%	50-150%
	13C5-PFPeA	98%	50-150%
	13C5-PFHxA	98%	50-150%
	13C4-PFHpA	99%	50-150%
	13C8-PFOA	100%	50-150%
	13C9-PFNA	99%	50-150%
	13C6-PFDA	102%	50-150%
	13C7-PFUnDA	106%	50-150%
	13C2-PFDoDA	104%	50-150%

Instrument Blank

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q747-IBLK	2Q50343.D	1	06/18/20	NAF	n/a	n/a	S2Q747

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75788-4

CAS No.	ID Standard Recoveries		Limits
	13C2-PFTeDA	109%	50-150%
	13C3-PFBS	99%	50-150%
	13C3-PFHxS	99%	50-150%
	13C8-PFOS	97%	50-150%
	13C8-FOSA	111%	50-150%
	d3-MeFOSAA	101%	50-150%
	13C2-4:2FTS	93%	50-150%
	13C2-6:2FTS	101%	50-150%
	13C2-8:2FTS	106%	50-150%

Blank Spike Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-BS	3Q22717.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-1, FA75788-2, FA75788-3, FA75788-4, FA75788-5, FA75788-6, FA75788-7, FA75788-8, FA75788-9, FA75788-10

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0765	96	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0792	99	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0769	96	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0784	98	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0778	97	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0758	95	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0770	96	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0767	96	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0824	103	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0892	112	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0845	106	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0797	100	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0811	101	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0792	99	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0821	103	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0773	97	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0781	98	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0693	87	60-130
754-91-6	PFOSA	0.08	0.0799	100	70-130
2355-31-9	MeFOSAA	0.08	0.0770	96	70-130
2991-50-6	EtFOSAA	0.08	0.0737	92	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0768	96	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0767	96	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0788	99	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	74%	35-135%
	13C5-PFPeA	74%	50-150%
	13C5-PFHxA	74%	50-150%
	13C4-PFHpA	75%	50-150%
	13C8-PFOA	76%	50-150%
	13C9-PFNA	75%	50-150%
	13C6-PFDA	72%	50-150%
	13C7-PFUnDA	63%	40-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-BS	3Q22717.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-1, FA75788-2, FA75788-3, FA75788-4, FA75788-5, FA75788-6, FA75788-7, FA75788-8, FA75788-9, FA75788-10

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	57%	40-140%
	13C2-PFTeDA	51%	30-130%
	13C3-PFBS	73%	50-150%
	13C3-PFHxS	72%	50-150%
	13C8-PFOS	69%	50-150%
	13C8-FOSA	62%	30-130%
	d3-MeFOSAA	70%	50-150%
	13C2-4:2FTS	74%	50-150%
	13C2-6:2FTS	73%	50-150%
	13C2-8:2FTS	69%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80727-BS	2Q50376.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
2706-90-3	Perfluoropentanoic acid	0.08	0.0579	72	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0625	78	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0619	77	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0639	80	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0613	77	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0625	78	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0635	79	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0634	79	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0673	84	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0631	79	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0626	78	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0626	78	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0612	77	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0595	74	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0591	74	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0607	76	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0548	69	60-130
754-91-6	PFOSA	0.08	0.0631	79	70-130
2355-31-9	MeFOSAA	0.08	0.0602	75	70-130
2991-50-6	EtFOSAA	0.08	0.0589	74	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0635	79	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0615	77	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0624	78	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	94%	35-135%
	13C5-PFPeA	97%	50-150%
	13C5-PFHxA	99%	50-150%
	13C4-PFHpA	97%	50-150%
	13C8-PFOA	102%	50-150%
	13C9-PFNA	103%	50-150%
	13C6-PFDA	104%	50-150%
	13C7-PFUnDA	97%	40-140%
	13C2-PFDoDA	95%	40-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80727-BS	2Q50376.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-4

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFTeDA	91%	30-130%
	13C3-PFBS	94%	50-150%
	13C3-PFHxS	97%	50-150%
	13C8-PFOS	99%	50-150%
	13C8-FOSA	90%	30-130%
	d3-MeFOSAA	107%	50-150%
	13C2-4:2FTS	96%	50-150%
	13C2-6:2FTS	100%	50-150%
	13C2-8:2FTS	106%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80727-MS	2Q50393.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747
FA75906-24	2Q50392.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-4

CAS No.	Compound	FA75906-24 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
2706-90-3	Perfluoropentanoic acid	0.0043	I	0.154	0.116	73	70-130
307-24-4	Perfluorohexanoic acid	0.0037	I	0.154	0.124	78	70-130
375-85-9	Perfluoroheptanoic acid	0.0051	I	0.154	0.125	78	70-130
335-67-1	Perfluorooctanoic acid	0.0116		0.154	0.134	80	70-130
375-95-1	Perfluorononanoic acid	0.0077	U	0.154	0.120	78	70-130
335-76-2	Perfluorodecanoic acid	0.0077	U	0.154	0.122	79	70-130
2058-94-8	Perfluoroundecanoic acid	0.0077	U	0.154	0.126	82	70-130
307-55-1	Perfluorododecanoic acid	0.0077	U	0.154	0.126	82	70-130
72629-94-8	Perfluorotridecanoic acid	0.0077	U	0.154	0.130	84	65-130
376-06-7	Perfluorotetradecanoic acid	0.0077	U	0.154	0.125	81	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0025	I	0.154	0.122	78	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.0077	U	0.154	0.119	77	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0046	I	0.154	0.126	79	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.0077	U	0.154	0.118	77	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0077	U	0.154	0.151	98	70-130
68259-12-1	Perfluorononanesulfonic acid	0.0077	U	0.154	0.114	74	65-130
335-77-3	Perfluorodecanesulfonic acid	0.0077	U	0.154	0.111	72	60-130
754-91-6	PFOSA	0.0077	U	0.154	0.123	80	70-130
2355-31-9	MeFOSAA	0.015	U	0.154	0.114	74	70-130
2991-50-6	EtFOSAA	0.015	U	0.154	0.120	78	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.015	U	0.154	0.122	79	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.015	U	0.154	0.119	77	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.015	U	0.154	0.121	79	70-130

CAS No.	ID Standard Recoveries	MS	FA75906-24	Limits
	13C4-PFBA	91%	98%	35-135%
	13C5-PFPeA	94%	100%	50-150%
	13C5-PFHxA	95%	101%	50-150%
	13C4-PFHpA	94%	99%	50-150%
	13C8-PFOA	99%	107%	50-150%
	13C9-PFNA	98%	106%	50-150%
	13C6-PFDA	98%	103%	50-150%
	13C7-PFUnDA	92%	97%	40-140%
	13C2-PFDoDA	92%	98%	40-140%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80727-MS	2Q50393.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747
FA75906-24	2Q50392.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-4

CAS No.	ID Standard Recoveries	MS	FA75906-24	Limits
	13C2-PFTeDA	92%	100%	30-130%
	13C3-PFBS	92%	99%	50-150%
	13C3-PFHxS	93%	98%	50-150%
	13C8-PFOS	93%	98%	50-150%
	13C8-FOSA	98%	109%	30-130%
	d3-MeFOSAA	101%	105%	50-150%
	13C2-4:2FTS	94%	98%	50-150%
	13C2-6:2FTS	101%	103%	50-150%
	13C2-8:2FTS	101%	103%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MS	3Q22737.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
OP80631-MSD	3Q22738.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
FA75789-6	3Q22736.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-1, FA75788-2, FA75788-3, FA75788-4, FA75788-5, FA75788-6, FA75788-7, FA75788-8, FA75788-9, FA75788-10

CAS No.	Compound	FA75789-6 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	ND		0.0714	0.0669	94	0.0714	0.0604	85	10	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.0714	0.0725	101	0.0714	0.0653	91	10	70-130/30
307-24-4	Perfluorohexanoic acid	ND		0.0714	0.0672	94	0.0714	0.0609	85	10	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.0714	0.0701	98	0.0714	0.0625	87	11	70-130/30
335-67-1	Perfluorooctanoic acid	ND		0.0714	0.0695	97	0.0714	0.0628	88	10	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0683	96	0.0714	0.0619	87	10	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0707	99	0.0714	0.0638	89	10	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0702	98	0.0714	0.0637	89	10	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0735	103	0.0714	0.0667	93	10	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0770	108	0.0714	0.0767	107	0	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0715	100	0.0714	0.0653	91	9	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND		0.0714	0.0828	116	0.0714	0.0741	104	11	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0693	97	0.0714	0.0617	86	12	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0690	97	0.0714	0.0628	88	9	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0750	105	0.0714	0.0693	97	8	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	ND		0.0714	0.0719	101	0.0714	0.0641	90	11	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0713	100	0.0714	0.0646	90	10	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0656	92	0.0714	0.0581	81	12	60-130/30
754-91-6	PFOSA	ND		0.0714	0.0684	96	0.0714	0.0628	88	9	70-130/30
2355-31-9	MeFOSAA	ND		0.0714	0.0751	105	0.0714	0.0655	92	14	70-130/30
2991-50-6	EtFOSAA	ND		0.0714	0.0751	105	0.0714	0.0657	92	13	70-130/30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0714	0.0685	96	0.0714	0.0621	87	10	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0682	95	0.0714	0.0619	87	10	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0717	100	0.0714	0.0633	89	12	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	FA75789-6	Limits
	13C4-PFBA	61%	81%	83%	35-135%
	13C5-PFPeA	62%	84%	86%	50-150%
	13C5-PFHxA	61%	82%	83%	50-150%
	13C4-PFHpA	63%	85%	86%	50-150%
	13C8-PFOA	67%	89%	94%	50-150%
	13C9-PFNA	68%	91%	94%	50-150%
	13C6-PFDA	63%	85%	90%	50-150%
	13C7-PFUnDA	58%	78%	77%	40-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MS	3Q22737.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
OP80631-MSD	3Q22738.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
FA75789-6	3Q22736.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-1, FA75788-2, FA75788-3, FA75788-4, FA75788-5, FA75788-6, FA75788-7, FA75788-8, FA75788-9, FA75788-10

CAS No.	ID Standard Recoveries	MS	MSD	FA75789-6	Limits
	13C2-PFDoDA	57%	77%	76%	40-140%
	13C2-PFTeDA	56%	65%	72%	30-130%
	13C3-PFBS	62%	83%	85%	50-150%
	13C3-PFHxS	61%	80%	81%	50-150%
	13C8-PFOS	60%	81%	82%	50-150%
	13C8-FOSA	68%	81%	92%	30-130%
	d3-MeFOSAA	63%	86%	86%	50-150%
	13C2-4:2FTS	63%	84%	81%	50-150%
	13C2-6:2FTS	65%	88%	88%	50-150%
	13C2-8:2FTS	60%	81%	80%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80727-DUP	2Q50380.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747
JD8588-1	2Q50379.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-4

CAS No.	Compound	JD8588-1 ug/l	Q	DUP ug/l	Q	RPD	Limits
2706-90-3	Perfluoropentanoic acid	0.0108		0.0105		3	30
307-24-4	Perfluorohexanoic acid	0.0107		0.0105		2	30
375-85-9	Perfluoroheptanoic acid	0.0062		0.0062		0	30
335-67-1	Perfluorooctanoic acid	0.0227		0.0224		1	30
375-95-1	Perfluorononanoic acid	0.0023	J	0.0020	J	14	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0030	J	0.0029	J	3	30
2706-91-4	Perfluoropentanesulfonic acid	0.0016	J	0.0016	J	0	30
355-46-4	Perfluorohexanesulfonic acid	0.0187		0.0164		13	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0394		0.0391		1	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	JD8588-1	Limits
	13C4-PFBA	96%		35-135%
	13C5-PFPeA	100%		50-150%
	13C5-PFHxA	102%		50-150%
	13C4-PFHpA	101%		50-150%
	13C8-PFOA	107%	95%	50-150%
	13C9-PFNA	108%		50-150%
	13C6-PFDA	103%		50-150%
	13C7-PFUnDA	95%		40-140%
	13C2-PFDoDA	99%		40-140%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA75788
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80727-DUP	2Q50380.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747
JD8588-1	2Q50379.D	1	06/18/20	NAF	06/17/20	OP80727	S2Q747

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75788-4

CAS No.	ID Standard Recoveries	DUP	JD8588-1	Limits
	13C2-PFTeDA	94%		30-130%
	13C3-PFBS	98%		50-150%
	13C3-PFHxS	98%		50-150%
	13C8-PFOS	99%	91%	50-150%
	13C8-FOSA	105%		30-130%
	d3-MeFOSAA	101%		50-150%
	13C2-4:2FTS	97%		50-150%
	13C2-6:2FTS	103%		50-150%
	13C2-8:2FTS	103%		50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA75789

Sampling Dates: 06/08/20 - 06/09/20

Report to:

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Total number of pages in report: 30

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Arcadis

Job No: FA75789

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA75789-1	06/08/20	10:35	AWJP	06/10/20	AQ	Ground Water	MW-02-04(3)_060820
FA75789-2	06/08/20	12:15	AWJP	06/10/20	AQ	Ground Water	MW-18-97_060820
FA75789-3	06/08/20	13:40	AWJP	06/10/20	AQ	Ground Water	MW-18-94_060820
FA75789-4	06/08/20	14:50	AWJP	06/10/20	AQ	Ground Water	MW-18-89_060820
FA75789-5	06/08/20	15:55	AWJP	06/10/20	AQ	Ground Water	CH-14-RO_060820
FA75789-6	06/09/20	15:00	AWJP	06/10/20	AQ	Ground Water	MW-91-2R_060920
FA75789-6D	06/09/20	15:00	AWJP	06/10/20	AQ	Water Dup/MSD	MW-91-2R_060920
FA75789-6S	06/09/20	15:00	AWJP	06/10/20	AQ	Water Matrix Spike	MW-91-2R_060920

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Summary of Hits

Job Number: FA75789
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/08/20 thru 06/09/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA75789-1	**MW-02-04(3)_060820**					
Perfluorobutanoic acid		0.0065 J	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0030 J	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.00093 J	0.0036	0.00089	ug/l	EPA 537M BY ID
FA75789-2	**MW-18-97_060820**					
No hits reported in this sample.						
FA75789-3	**MW-18-94_060820**					
No hits reported in this sample.						
FA75789-4	**MW-18-89_060820**					
Perfluorobutanoic acid		0.0091	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0085	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0067	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0049	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0141	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0012 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.00094 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0046	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0032 J	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid [a]		0.150	0.018	0.0067	ug/l	EPA 537M BY ID
FA75789-5	**CH-14-RO_060820**					
Perfluorobutanoic acid		0.0172	0.0071	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0156	0.0036	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0359	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0297	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0692	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.113	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.222	0.0036	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		1.56	0.036	0.0089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.367	0.036	0.0089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		12.9	0.36	0.13	ug/l	EPA 537M BY ID
FA75789-6	**MW-91-2R_060920**					
No hits reported in this sample.						

(a) Dilution required due to matrix interference (ID recovery standard failure).

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-02-04(3)_060820		
Lab Sample ID:	FA75789-1	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22731.D	1	06/15/20 21:56	NG	06/12/20 08:00	OP80631	S3Q346
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0065	0.0071	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0030	0.0036	0.0013	ug/l	J
307-24-4	Perfluorohexanoic acid	0.00093	0.0036	0.00089	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-02-04(3)_060820		
Lab Sample ID:	FA75789-1	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	72%		35-135%
	13C5-PFPeA	76%		50-150%
	13C5-PFHxA	77%		50-150%
	13C4-PFHpA	81%		50-150%
	13C8-PFOA	84%		50-150%
	13C9-PFNA	81%		50-150%
	13C6-PFDA	75%		50-150%
	13C7-PFUnDA	65%		40-140%
	13C2-PFDoDA	68%		40-140%
	13C2-PFTeDA	67%		30-130%
	13C3-PFBS	77%		50-150%
	13C3-PFHxS	76%		50-150%
	13C8-PFOS	70%		50-150%
	13C8-FOSA	81%		30-130%
	d3-MeFOSAA	73%		50-150%
	13C2-4:2FTS	74%		50-150%
	13C2-6:2FTS	79%		50-150%
	13C2-8:2FTS	67%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-97_060820		
Lab Sample ID:	FA75789-2	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22732.D	1	06/15/20 22:11	NG	06/12/20 08:00	OP80631	S3Q346
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-97_060820		
Lab Sample ID:	FA75789-2	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	88%		35-135%
	13C5-PFPeA	91%		50-150%
	13C5-PFHxA	88%		50-150%
	13C4-PFHpA	90%		50-150%
	13C8-PFOA	95%		50-150%
	13C9-PFNA	95%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	71%		40-140%
	13C2-PFDoDA	58%		40-140%
	13C2-PFTeDA	30%		30-130%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	85%		50-150%
	13C8-PFOS	80%		50-150%
	13C8-FOSA	67%		30-130%
	d3-MeFOSAA	80%		50-150%
	13C2-4:2FTS	85%		50-150%
	13C2-6:2FTS	90%		50-150%
	13C2-8:2FTS	78%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-94_060820		
Lab Sample ID:	FA75789-3	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22733.D	1	06/15/20 22:26	NG	06/12/20 08:00	OP80631	S3Q346
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-94_060820		
Lab Sample ID:	FA75789-3	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	86%		35-135%
	13C5-PFPeA	90%		50-150%
	13C5-PFHxA	91%		50-150%
	13C4-PFHpA	94%		50-150%
	13C8-PFOA	97%		50-150%
	13C9-PFNA	93%		50-150%
	13C6-PFDA	83%		50-150%
	13C7-PFUnDA	73%		40-140%
	13C2-PFDoDA	70%		40-140%
	13C2-PFTeDA	55%		30-130%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	89%		50-150%
	13C8-PFOS	81%		50-150%
	13C8-FOSA	85%		30-130%
	d3-MeFOSAA	80%		50-150%
	13C2-4:2FTS	86%		50-150%
	13C2-6:2FTS	90%		50-150%
	13C2-8:2FTS	76%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-89_060820		
Lab Sample ID:	FA75789-4	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22734.D	1	06/15/20 22:41	NG	06/12/20 08:00	OP80631	S3Q346
Run #2 [a]	3Q22780.D	5	06/16/20 10:34	NG	06/12/20 08:00	OP80631	S3Q346

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0091	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0085	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0067	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0049	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0141	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0012	0.0036	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	ND [b]	0.018	0.0045	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND [b]	0.018	0.0045	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND [b]	0.018	0.0045	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.00094	0.0036	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0046	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0032	0.0036	0.00089	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.150 [b]	0.018	0.0067	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND [b]	0.018	0.0045	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.018	0.0045	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-89_060820		
Lab Sample ID:	FA75789-4	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	68%	70%	35-135%
	13C5-PFPeA	72%	69%	50-150%
	13C5-PFHxA	65%	65%	50-150%
	13C4-PFHpA	63%	61%	50-150%
	13C8-PFOA	63%	63%	50-150%
	13C9-PFNA	56%	63%	50-150%
	13C6-PFDA	47% [c]	64%	50-150%
	13C7-PFUnDA	55%	56%	40-140%
	13C2-PFDoDA	52%	48%	40-140%
	13C2-PFTeDA	24% [c]	36%	30-130%
	13C3-PFBS	72%	69%	50-150%
	13C3-PFHxS	61%	57%	50-150%
	13C8-PFOS	43% [c]	51%	50-150%
	13C8-FOSA	27% [c]	55%	30-130%
	d3-MeFOSAA	58%	62%	50-150%
	13C2-4:2FTS	68%	65%	50-150%
	13C2-6:2FTS	68%	62%	50-150%
	13C2-8:2FTS	51%	58%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CH-14-RO_060820		
Lab Sample ID:	FA75789-5	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22735.D	1	06/15/20 22:57	NG	06/12/20 08:00	OP80631	S3Q346
Run #2	3Q22781.D	10	06/16/20 10:49	NG	06/12/20 08:00	OP80631	S3Q346
Run #3	3Q22782.D	100	06/16/20 11:04	NG	06/12/20 08:00	OP80631	S3Q346

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml
Run #3	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0172	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0156	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0359	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0297	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0692	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND [a]	0.036	0.0089	ug/l	
307-55-1	Perfluorododecanoic acid	ND [b]	0.36	0.13	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND [b]	0.36	0.089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND [b]	0.36	0.089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.113	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.222	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	1.56 [a]	0.036	0.0089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.367 [a]	0.036	0.0089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	12.9 [b]	0.36	0.13	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND [b]	0.71	0.36	ug/l	
2991-50-6	EtFOSAA	ND [b]	0.71	0.36	ug/l	
FLUOROTELOMER SULFONATES						

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CH-14-RO_060820		
Lab Sample ID:	FA75789-5	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND [a]	0.071	0.018	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Run# 3	Limits
	13C4-PFBA	83%	82%	71%	35-135%
	13C5-PFPeA	87%	81%	69%	50-150%
	13C5-PFHxA	79%	79%	69%	50-150%
	13C4-PFHpA	65%	78%	70%	50-150%
	13C8-PFOA	50%	73%	71%	50-150%
	13C9-PFNA	63%	71%	71%	50-150%
	13C6-PFDA	69%	64%	71%	50-150%
	13C7-PFUnDA	39% [c]	40%	70%	40-140%
	13C2-PFDoDA	15% [c]	19% [c]	71%	40-140%
	13C2-PFTeDA	3% [c]	3% [c]	73%	30-130%
	13C3-PFBS	85%	81%	71%	50-150%
	13C3-PFHxS	61%	73%	67%	50-150%
	13C8-PFOS	50%	60%	64%	50-150%
	13C8-FOSA	42%	46%	75%	30-130%
	d3-MeFOSAA	39% [c]	44% [c]	77%	50-150%
	13C2-4:2FTS	79%	76%	66%	50-150%
	13C2-6:2FTS	29% [c]	69%	64%	50-150%
	13C2-8:2FTS	65%	59%	63%	50-150%

(a) Result is from Run# 2
(b) Result is from Run# 3
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-91-2R_060920		
Lab Sample ID:	FA75789-6	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22736.D	1	06/15/20 23:12	NG	06/12/20 08:00	OP80631	S3Q346
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-91-2R_060920		
Lab Sample ID:	FA75789-6	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	83%		35-135%
	13C5-PFPeA	86%		50-150%
	13C5-PFHxA	83%		50-150%
	13C4-PFHpA	86%		50-150%
	13C8-PFOA	94%		50-150%
	13C9-PFNA	94%		50-150%
	13C6-PFDA	90%		50-150%
	13C7-PFUnDA	77%		40-140%
	13C2-PFDoDA	76%		40-140%
	13C2-PFTeDA	72%		30-130%
	13C3-PFBS	85%		50-150%
	13C3-PFHxS	81%		50-150%
	13C8-PFOS	82%		50-150%
	13C8-FOSA	92%		30-130%
	d3-MeFOSAA	86%		50-150%
	13C2-4:2FTS	81%		50-150%
	13C2-6:2FTS	88%		50-150%
	13C2-8:2FTS	80%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA75789
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

SGS North America Inc - Orlando

Chain of Custody

FA75789

SGS Plant 3

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # : PAGE 1 OF 1

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis of Michigan, LLC
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Michael.Spaeth@arcadis.com Email:
Phone #: 313-407-8332
Sampler(s) Name(s) (Printed) Sampler 1: Austin Westhuis Sampler 2:

Project Information

Project Name: RACER Lansing Plant 3
Street: 2801 W. Saginaw Street
City: Lansing State: MI
Project #: 30042872.03700
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via Method 537 mod. with isotope dilution per QSM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	CONTAINER INFORMATION: OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZNAc	DI WATER	MEOH	LAB USE ONLY
1	MW-02-04(3)_060820	6/8/20	1035	aw	GW	2		2							X	
2	MW-18-97_060820	6/8/20	1215	aw	GW	2		2							X	
3	MW-18-94_060820	6/8/20	1340	aw	GW	2		2							X	
4	MW-18-89_060820	6/8/20	1450	JP	GW	2		2							X	
5	CH-14-RD_060820	6/8/20	1555	JP	GW	2		2							X	
6	MW-91-2R_060920 MS/MSD	6/9/20	1500	aw	GW	3		3							X	

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other Standard

Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [x] EDD'S

Comments / Remarks

*Need all 24 analytes in EGLE list reported

PM ASSESSMENT

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1		6/9/20	2 FX	3 FX		4 6/10/20 930
5	Relinquished by/Affiliation	Date Time:	6 Received By/Affiliation	7 Relinquished By/Affiliation	Date Time:	8 Received By/Affiliation

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 3.0

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA75789: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA75789 **Client:** ARCADIS OF MICHIGAN **Project:** RACER LANSING PLANT 3

Date / Time Received: 6/10/2020 9:30:00 AM **Delivery Method:** FX **Airbill #'s:**

Therm ID: IR 1; **Therm CF:** -0.8; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.8);

Cooler Temps (Corrected) °C: Cooler 1: (3.0);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: PETERH Date: 6/10/2020 9:30:00 AM Reviewer: _____ Date: _____

FA75789: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA75789
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MB	3Q22718.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75789-1, FA75789-2, FA75789-3, FA75789-4, FA75789-5, FA75789-6

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	94%	35-135%
	13C5-PFPeA	93%	50-150%
	13C5-PFHxA	95%	50-150%
	13C4-PFHpA	95%	50-150%
	13C8-PFOA	97%	50-150%
	13C9-PFNA	96%	50-150%
	13C6-PFDA	93%	50-150%
	13C7-PFUnDA	85%	40-140%

Method Blank Summary

Job Number: FA75789
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MB	3Q22718.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75789-1, FA75789-2, FA75789-3, FA75789-4, FA75789-5, FA75789-6

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	75%	30-130%
	13C3-PFBS	92%	50-150%
	13C3-PFHxS	90%	50-150%
	13C8-PFOS	87%	50-150%
	13C8-FOSA	89%	30-130%
	d3-MeFOSAA	98%	50-150%
	13C2-4:2FTS	89%	50-150%
	13C2-6:2FTS	89%	50-150%
	13C2-8:2FTS	85%	50-150%

Instrument Blank

Job Number: FA75789
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q346-IBLK	3Q22688.D	1	06/15/20	NG	n/a	n/a	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75789-1, FA75789-2, FA75789-3, FA75789-4, FA75789-5, FA75789-6

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	105%	50-150%
	13C5-PFPeA	102%	50-150%
	13C5-PFHxA	102%	50-150%
	13C4-PFHpA	104%	50-150%
	13C8-PFOA	106%	50-150%
	13C9-PFNA	105%	50-150%
	13C6-PFDA	105%	50-150%
	13C7-PFUnDA	105%	50-150%

Instrument Blank

Job Number: FA75789
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q346-IBLK	3Q22688.D	1	06/15/20	NG	n/a	n/a	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75789-1, FA75789-2, FA75789-3, FA75789-4, FA75789-5, FA75789-6

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	106%	50-150%
	13C2-PFTeDA	109%	50-150%
	13C3-PFBS	103%	50-150%
	13C3-PFHxS	101%	50-150%
	13C8-PFOS	99%	50-150%
	13C8-FOSA	111%	50-150%
	d3-MeFOSAA	110%	50-150%
	13C2-4:2FTS	96%	50-150%
	13C2-6:2FTS	97%	50-150%
	13C2-8:2FTS	91%	50-150%

Blank Spike Summary

Job Number: FA75789
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-BS	3Q22717.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75789-1, FA75789-2, FA75789-3, FA75789-4, FA75789-5, FA75789-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0765	96	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0792	99	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0769	96	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0784	98	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0778	97	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0758	95	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0770	96	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0767	96	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0824	103	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0892	112	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0845	106	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0797	100	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0811	101	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0792	99	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0821	103	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0773	97	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0781	98	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0693	87	60-130
754-91-6	PFOSA	0.08	0.0799	100	70-130
2355-31-9	MeFOSAA	0.08	0.0770	96	70-130
2991-50-6	EtFOSAA	0.08	0.0737	92	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0768	96	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0767	96	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0788	99	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	74%	35-135%
	13C5-PFPeA	74%	50-150%
	13C5-PFHxA	74%	50-150%
	13C4-PFHpA	75%	50-150%
	13C8-PFOA	76%	50-150%
	13C9-PFNA	75%	50-150%
	13C6-PFDA	72%	50-150%
	13C7-PFUnDA	63%	40-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75789
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-BS	3Q22717.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75789-1, FA75789-2, FA75789-3, FA75789-4, FA75789-5, FA75789-6

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	57%	40-140%
	13C2-PFTeDA	51%	30-130%
	13C3-PFBS	73%	50-150%
	13C3-PFHxS	72%	50-150%
	13C8-PFOS	69%	50-150%
	13C8-FOSA	62%	30-130%
	d3-MeFOSAA	70%	50-150%
	13C2-4:2FTS	74%	50-150%
	13C2-6:2FTS	73%	50-150%
	13C2-8:2FTS	69%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75789
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MS	3Q22737.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
OP80631-MSD	3Q22738.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
FA75789-6	3Q22736.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75789-1, FA75789-2, FA75789-3, FA75789-4, FA75789-5, FA75789-6

CAS No.	Compound	FA75789-6 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	ND		0.0714	0.0669	94	0.0714	0.0604	85	10	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.0714	0.0725	101	0.0714	0.0653	91	10	70-130/30
307-24-4	Perfluorohexanoic acid	ND		0.0714	0.0672	94	0.0714	0.0609	85	10	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.0714	0.0701	98	0.0714	0.0625	87	11	70-130/30
335-67-1	Perfluorooctanoic acid	ND		0.0714	0.0695	97	0.0714	0.0628	88	10	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0683	96	0.0714	0.0619	87	10	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0707	99	0.0714	0.0638	89	10	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0702	98	0.0714	0.0637	89	10	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0735	103	0.0714	0.0667	93	10	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0770	108	0.0714	0.0767	107	0	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0715	100	0.0714	0.0653	91	9	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND		0.0714	0.0828	116	0.0714	0.0741	104	11	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0693	97	0.0714	0.0617	86	12	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0690	97	0.0714	0.0628	88	9	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0750	105	0.0714	0.0693	97	8	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	ND		0.0714	0.0719	101	0.0714	0.0641	90	11	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0713	100	0.0714	0.0646	90	10	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0656	92	0.0714	0.0581	81	12	60-130/30
754-91-6	PFOSA	ND		0.0714	0.0684	96	0.0714	0.0628	88	9	70-130/30
2355-31-9	MeFOSAA	ND		0.0714	0.0751	105	0.0714	0.0655	92	14	70-130/30
2991-50-6	EtFOSAA	ND		0.0714	0.0751	105	0.0714	0.0657	92	13	70-130/30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0714	0.0685	96	0.0714	0.0621	87	10	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0682	95	0.0714	0.0619	87	10	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0717	100	0.0714	0.0633	89	12	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	FA75789-6	Limits
	13C4-PFBA	61%	81%	83%	35-135%
	13C5-PFPeA	62%	84%	86%	50-150%
	13C5-PFHxA	61%	82%	83%	50-150%
	13C4-PFHpA	63%	85%	86%	50-150%
	13C8-PFOA	67%	89%	94%	50-150%
	13C9-PFNA	68%	91%	94%	50-150%
	13C6-PFDA	63%	85%	90%	50-150%
	13C7-PFUnDA	58%	78%	77%	40-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75789
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MS	3Q22737.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
OP80631-MSD	3Q22738.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
FA75789-6	3Q22736.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75789-1, FA75789-2, FA75789-3, FA75789-4, FA75789-5, FA75789-6

CAS No.	ID Standard Recoveries	MS	MSD	FA75789-6	Limits
	13C2-PFDoDA	57%	77%	76%	40-140%
	13C2-PFTeDA	56%	65%	72%	30-130%
	13C3-PFBS	62%	83%	85%	50-150%
	13C3-PFHxS	61%	80%	81%	50-150%
	13C8-PFOS	60%	81%	82%	50-150%
	13C8-FOSA	68%	81%	92%	30-130%
	d3-MeFOSAA	63%	86%	86%	50-150%
	13C2-4:2FTS	63%	84%	81%	50-150%
	13C2-6:2FTS	65%	88%	88%	50-150%
	13C2-8:2FTS	60%	81%	80%	50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

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Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA75790

Sampling Dates: 06/08/20 - 06/09/20

Report to:

andrea.colby@sgs.com

Total number of pages in report: 24

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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Test results relate only to samples analyzed.

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA75790

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
FA75790-1	06/08/20	10:05	JPAW	06/10/20	AQ	Ground Water	MW-03-07_060820
FA75790-2	06/09/20	09:30	JPAW	06/10/20	AQ	Equipment Blank	EB-02_060920
FA75790-3	06/09/20	10:35	JPAW	06/10/20	AQ	Ground Water	MW-03-08_060920

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Summary of Hits

Job Number: FA75790
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 06/08/20 thru 06/09/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA75790-1	**MW-03-07_060820**					
Perfluorobutanoic acid		0.0041 J	0.0069	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0081	0.0034	0.0013	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0051	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0014 J	0.0034	0.00086	ug/l	EPA 537M BY ID
FA75790-2	**EB-02_060920**					
No hits reported in this sample.						
FA75790-3	**MW-03-08_060920**					
Perfluorooctanoic acid		0.00095 J	0.0034	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0034	0.0034	0.0013	ug/l	EPA 537M BY ID

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-03-07_060820		
Lab Sample ID:	FA75790-1	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22741.D	1	06/16/20 00:27	NG	06/12/20 08:00	OP80631	S3Q346
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0041	0.0069	0.0017	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0081	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	0.0051	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0014	0.0034	0.00086	ug/l	J
335-67-1	Perfluorooctanoic acid	ND	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-03-07_060820		
Lab Sample ID:	FA75790-1	**Date Sampled:**	06/08/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	61%		35-135%
	13C5-PFPeA	69%		50-150%
	13C5-PFHxA	66%		50-150%
	13C4-PFHpA	66%		50-150%
	13C8-PFOA	64%		50-150%
	13C9-PFNA	69%		50-150%
	13C6-PFDA	83%		50-150%
	13C7-PFUnDA	79%		40-140%
	13C2-PFDoDA	78%		40-140%
	13C2-PFTeDA	72%		30-130%
	13C3-PFBS	71%		50-150%
	13C3-PFHxS	65%		50-150%
	13C8-PFOS	54%		50-150%
	13C8-FOSA	69%		30-130%
	d3-MeFOSAA	83%		50-150%
	13C2-4:2FTS	69%		50-150%
	13C2-6:2FTS	68%		50-150%
	13C2-8:2FTS	73%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-02_060920		
Lab Sample ID:	FA75790-2	**Date Sampled:**	06/09/20
Matrix:	AQ - Equipment Blank	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22742.D	1	06/16/20 00:43	NG	06/12/20 08:00	OP80631	S3Q346
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0034	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-02_060920		
Lab Sample ID:	FA75790-2	**Date Sampled:**	06/09/20
Matrix:	AQ - Equipment Blank	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	95%		35-135%
	13C5-PFPeA	93%		50-150%
	13C5-PFHxA	94%		50-150%
	13C4-PFHpA	95%		50-150%
	13C8-PFOA	95%		50-150%
	13C9-PFNA	93%		50-150%
	13C6-PFDA	91%		50-150%
	13C7-PFUnDA	87%		40-140%
	13C2-PFDoDA	82%		40-140%
	13C2-PFTeDA	65%		30-130%
	13C3-PFBS	93%		50-150%
	13C3-PFHxS	90%		50-150%
	13C8-PFOS	84%		50-150%
	13C8-FOSA	103%		30-130%
	d3-MeFOSAA	97%		50-150%
	13C2-4:2FTS	90%		50-150%
	13C2-6:2FTS	88%		50-150%
	13C2-8:2FTS	82%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-03-08_060920		
Lab Sample ID:	FA75790-3	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q22743.D	1	06/16/20 00:58	NG	06/12/20 08:00	OP80631	S3Q346
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0069	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0034	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0034	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0034	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.00095	0.0034	0.00086	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0034	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0034	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0034	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0034	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0034	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0034	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0034	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0034	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0034	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0034	0.0034	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0034	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0069	0.0034	ug/l	
2991-50-6	EtFOSAA	ND	0.0069	0.0034	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-03-08_060920		
Lab Sample ID:	FA75790-3	**Date Sampled:**	06/09/20
Matrix:	AQ - Ground Water	**Date Received:**	06/10/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	82%		35-135%
	13C5-PFPeA	85%		50-150%
	13C5-PFHxA	85%		50-150%
	13C4-PFHpA	88%		50-150%
	13C8-PFOA	92%		50-150%
	13C9-PFNA	91%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	69%		40-140%
	13C2-PFDoDA	60%		40-140%
	13C2-PFTeDA	37%		30-130%
	13C3-PFBS	86%		50-150%
	13C3-PFHxS	84%		50-150%
	13C8-PFOS	80%		50-150%
	13C8-FOSA	73%		30-130%
	d3-MeFOSAA	78%		50-150%
	13C2-4:2FTS	82%		50-150%
	13C2-6:2FTS	88%		50-150%
	13C2-8:2FTS	76%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA75790
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

Plant 6

FA75790

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # : PAGE 1 OF 1

SGS - ORLANDO Quote # SKIFF #

Client / Reporting Information

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Michael.Spicil@arcadis.com Email:
Phone #: 313-407-8332
Sampler(s) Name(s) (Printed): Jake Pisarkiewicz
Sampler 1: Sampler 2:

Project Information

Project Name: Race Lansing - Plant 6
Street: 2801 W. Saginaw Rd
City: Lansing State: MI
Project #: 30042872 03700
Fax #: 248 994 2241
Client Purchase Order #

Analytical Information

PFAS via modified 537.1 mod. with isotope dilution per QSM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZnAc	DI WATER	MEOH	LAB USE ONLY
1	MW-03-07_060820	6/8/20	1005	JSP	GW	2		2							X	
2	EB-02_060920	6/9/20	0930	GW	GW	1		1							X	
3	MW-03-08_060920	6/9/20	1035	GW	GW	2		2							X	

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other Standard

Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [x] EDD'S

Comments / Remarks

AG
AG

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1 Arcadis	6/9/20	2 FF	3 FF		4 Peter 6/10/20 930
Relinquished by/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
5		6	7		8

Lab Use Only: Cooler Temperature (s) Celsius (corrected): 3.0

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

SGS Sample Receipt Summary

Job Number: FA75790 **Client:** ARCADIS **Project:** RACER LANDING PLANT 6

Date / Time Received: 6/10/2020 9:30:00 AM **Delivery Method:** FX **Airbill #'s:**

Therm ID: IR 1; **Therm CF:** -0.8; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.8);

Cooler Temps (Corrected) °C: Cooler 1: (3.0);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: PETERH Date: 6/10/2020 9:30:00 AM Reviewer: _____ Date: _____

FA75790: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA75790
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MB	3Q22718.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	94%	35-135%
	13C5-PFPeA	93%	50-150%
	13C5-PFHxA	95%	50-150%
	13C4-PFHpA	95%	50-150%
	13C8-PFOA	97%	50-150%
	13C9-PFNA	96%	50-150%
	13C6-PFDA	93%	50-150%
	13C7-PFUnDA	85%	40-140%

Method Blank Summary

Job Number: FA75790
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MB	3Q22718.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	75%	30-130%
	13C3-PFBS	92%	50-150%
	13C3-PFHxS	90%	50-150%
	13C8-PFOS	87%	50-150%
	13C8-FOSA	89%	30-130%
	d3-MeFOSAA	98%	50-150%
	13C2-4:2FTS	89%	50-150%
	13C2-6:2FTS	89%	50-150%
	13C2-8:2FTS	85%	50-150%

Instrument Blank

Job Number: FA75790
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q346-IBLK	3Q22688.D	1	06/15/20	NG	n/a	n/a	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75790-1, FA75790-2, FA75790-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	105%	50-150%
	13C5-PFPeA	102%	50-150%
	13C5-PFHxA	102%	50-150%
	13C4-PFHpA	104%	50-150%
	13C8-PFOA	106%	50-150%
	13C9-PFNA	105%	50-150%
	13C6-PFDA	105%	50-150%
	13C7-PFUnDA	105%	50-150%

Instrument Blank

Job Number: FA75790
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q346-IBLK	3Q22688.D	1	06/15/20	NG	n/a	n/a	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA75790-1, FA75790-2, FA75790-3

CAS No.	ID Standard Recoveries		Limits
	13C2-PFDoDA	106%	50-150%
	13C2-PFTeDA	109%	50-150%
	13C3-PFBS	103%	50-150%
	13C3-PFHxS	101%	50-150%
	13C8-PFOS	99%	50-150%
	13C8-FOSA	111%	50-150%
	d3-MeFOSAA	110%	50-150%
	13C2-4:2FTS	96%	50-150%
	13C2-6:2FTS	97%	50-150%
	13C2-8:2FTS	91%	50-150%

Blank Spike Summary

Job Number: FA75790
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-BS	3Q22717.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0765	96	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0792	99	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0769	96	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0784	98	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0778	97	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0758	95	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0770	96	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0767	96	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0824	103	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0892	112	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0845	106	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0797	100	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0811	101	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0792	99	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0821	103	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0773	97	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0781	98	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0693	87	60-130
754-91-6	PFOSA	0.08	0.0799	100	70-130
2355-31-9	MeFOSAA	0.08	0.0770	96	70-130
2991-50-6	EtFOSAA	0.08	0.0737	92	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0768	96	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0767	96	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0788	99	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	74%	35-135%
	13C5-PFPeA	74%	50-150%
	13C5-PFHxA	74%	50-150%
	13C4-PFHpA	75%	50-150%
	13C8-PFOA	76%	50-150%
	13C9-PFNA	75%	50-150%
	13C6-PFDA	72%	50-150%
	13C7-PFUnDA	63%	40-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA75790
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-BS	3Q22717.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	57%	40-140%
	13C2-PFTeDA	51%	30-130%
	13C3-PFBS	73%	50-150%
	13C3-PFHxS	72%	50-150%
	13C8-PFOS	69%	50-150%
	13C8-FOSA	62%	30-130%
	d3-MeFOSAA	70%	50-150%
	13C2-4:2FTS	74%	50-150%
	13C2-6:2FTS	73%	50-150%
	13C2-8:2FTS	69%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75790
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MS	3Q22737.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
OP80631-MSD	3Q22738.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
FA75789-6	3Q22736.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

CAS No.	Compound	FA75789-6 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	ND		0.0714	0.0669	94	0.0714	0.0604	85	10	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.0714	0.0725	101	0.0714	0.0653	91	10	70-130/30
307-24-4	Perfluorohexanoic acid	ND		0.0714	0.0672	94	0.0714	0.0609	85	10	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.0714	0.0701	98	0.0714	0.0625	87	11	70-130/30
335-67-1	Perfluorooctanoic acid	ND		0.0714	0.0695	97	0.0714	0.0628	88	10	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0683	96	0.0714	0.0619	87	10	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0707	99	0.0714	0.0638	89	10	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0702	98	0.0714	0.0637	89	10	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0735	103	0.0714	0.0667	93	10	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0770	108	0.0714	0.0767	107	0	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0715	100	0.0714	0.0653	91	9	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND		0.0714	0.0828	116	0.0714	0.0741	104	11	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0693	97	0.0714	0.0617	86	12	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0690	97	0.0714	0.0628	88	9	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0750	105	0.0714	0.0693	97	8	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	ND		0.0714	0.0719	101	0.0714	0.0641	90	11	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0713	100	0.0714	0.0646	90	10	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0656	92	0.0714	0.0581	81	12	60-130/30
754-91-6	PFOSA	ND		0.0714	0.0684	96	0.0714	0.0628	88	9	70-130/30
2355-31-9	MeFOSAA	ND		0.0714	0.0751	105	0.0714	0.0655	92	14	70-130/30
2991-50-6	EtFOSAA	ND		0.0714	0.0751	105	0.0714	0.0657	92	13	70-130/30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0714	0.0685	96	0.0714	0.0621	87	10	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0682	95	0.0714	0.0619	87	10	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0717	100	0.0714	0.0633	89	12	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	FA75789-6	Limits
	13C4-PFBA	61%	81%	83%	35-135%
	13C5-PFPeA	62%	84%	86%	50-150%
	13C5-PFHxA	61%	82%	83%	50-150%
	13C4-PFHpA	63%	85%	86%	50-150%
	13C8-PFOA	67%	89%	94%	50-150%
	13C9-PFNA	68%	91%	94%	50-150%
	13C6-PFDA	63%	85%	90%	50-150%
	13C7-PFUnDA	58%	78%	77%	40-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75790
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP80631-MS	3Q22737.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
OP80631-MSD	3Q22738.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346
FA75789-6	3Q22736.D	1	06/15/20	NG	06/12/20	OP80631	S3Q346

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

CAS No.	ID Standard Recoveries	MS	MSD	FA75789-6	Limits
	13C2-PFDoDA	57%	77%	76%	40-140%
	13C2-PFTeDA	56%	65%	72%	30-130%
	13C3-PFBS	62%	83%	85%	50-150%
	13C3-PFHxS	61%	80%	81%	50-150%
	13C8-PFOS	60%	81%	82%	50-150%
	13C8-FOSA	68%	81%	92%	30-130%
	d3-MeFOSAA	63%	86%	86%	50-150%
	13C2-4:2FTS	63%	84%	81%	50-150%
	13C2-6:2FTS	65%	88%	88%	50-150%
	13C2-8:2FTS	60%	81%	80%	50-150%

* = Outside of Control Limits.

Quality Control Report

Report ID: QC-S15985-01
Generated on 09/15/2020

Report to

Attention: Marina Samp
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-994-2318 C:616-638-6394 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S15985.01-S15985.04
Project: 30042872.04600 / RACER Lansing
Submitted Date/Time: 07/23/2020 18:40
Sampled by: A. Mandich
P.O. #: 30042872.04600

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-5)
Prep Batch Summary (Page 6)
Surrogates per QC Sample (Page 7)
Batch QC Results (Pages 8-11)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S15985.01
Sample Tag: MW-20-126_072320
Collected Date/Time: 07/23/2020 10:20
Matrix: Groundwater
COC Reference: 134311

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	08/06/20 13:46	200806A9	VS200805W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S15985.02
Sample Tag: MW-20-127_072320
Collected Date/Time: 07/23/2020 12:25
Matrix: Groundwater
COC Reference: 134311

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	08/06/20 14:13	200806A9	VS200805W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S15985.03
Sample Tag: MW-20-128_072320
Collected Date/Time: 07/23/2020 14:45
Matrix: Groundwater
COC Reference: 134311

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	07/24/20 11:21	NTRA200724-W1-B	NTRA200724-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	07/29/20 15:45	TKN200729QC	TKN200729QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	07/29/20 18:10	PHS200729QC	PHS200729QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	08/06/20 14:57	200806A9	VS200805W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S15985.04
Sample Tag: MW-20-129_072320
Collected Date/Time: 07/23/2020 16:15
Matrix: Groundwater
COC Reference: 134311

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	08/06/20 14:35	200806A9	VS200805W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: NTRA200724-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15985.03	Nitrate-N	E300.0	07/24/20 11:21	NTRA200724-W1-B

Inorganics, Prep Batch ID: PHS200729QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15985.03	Total Phosphorus	SM4500-PE	07/29/20 18:10	PHS200729QC

Inorganics, Prep Batch ID: TKN200729QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15985.03	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	07/29/20 15:45	TKN200729QC

Organics - Volatiles, Prep Batch ID: VS200805W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15985.01	1,4-Dioxane	SW8260B - SIM	08/06/20 13:46	200806A9
S15985.02	1,4-Dioxane	SW8260B - SIM	08/06/20 14:13	200806A9
S15985.03	1,4-Dioxane	SW8260B - SIM	08/06/20 14:57	200806A9
S15985.04	1,4-Dioxane	SW8260B - SIM	08/06/20 14:35	200806A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200805W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200806A9.BLKW06C

Run in Batch: 200806A9, Run Date: 08/06/2020 16:06, Prep Date: 08/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200806A9.LCSW06A

Run in Batch: 200806A9, Run Date: 08/06/2020 10:30, Prep Date: 08/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200806A9.LCSDW06A, Parent Sample ID: 200806A9.LCSW06A

Run in Batch: 200806A9, Run Date: 08/06/2020 10:51, Prep Date: 08/05/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Inorganics, Prep Batch ID: NTRA200724-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA200724-W1-B.LRB1

Run in Batch: NTRA200724-W1-B, Run Date: 07/24/2020 09:26, Prep Date: 07/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA200724-W1-B.LCS1

Run in Batch: NTRA200724-W1-B, Run Date: 07/24/2020 09:51, Prep Date: 07/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		100	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA200724-W1-B.MS1, Parent Sample ID: S15944.01

Run in Batch: NTRA200724-W1-B, Run Date: 07/24/2020 12:25, Prep Date: 07/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		100	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA200724-W1-B.MSD1, Parent Sample ID: NTRA200724-W1-B.MS1

Run in Batch: NTRA200724-W1-B, Run Date: 07/24/2020 12:38, Prep Date: 07/24/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		101	80	120	1	15

Duplicate (DUP)

Lab Sample ID: NTRA200724-W1-B.DP1, Parent Sample ID: S15944.01

Run in Batch: NTRA200724-W1-B, Run Date: 07/24/2020 12:13, Prep Date: 07/24/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	RPD	RPD CL
Nitrate-N		<1	15

Inorganics, Prep Batch ID: PHS200729QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS200729QC.LRB1

Run in Batch: PHS200729QC, Run Date: 07/29/2020 12:51, Prep Date: 07/29/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS200729QC.LRB2

Run in Batch: PHS200729QC, Run Date: 07/29/2020 12:58, Prep Date: 07/29/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS200729QC.LCS1

Run in Batch: PHS200729QC, Run Date: 07/29/2020 13:04, Prep Date: 07/29/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		93	90	110

Matrix Spike (MS)

Lab Sample ID: PHS200729QC.MS1, Parent Sample ID: S15907.01

Run in Batch: PHS200729QC, Run Date: 07/29/2020 18:39, Prep Date: 07/29/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		94	80	120

Duplicate (DUP)

Lab Sample ID: PHS200729QC.DP1, Parent Sample ID: S15853.01

Run in Batch: PHS200729QC, Run Date: 07/29/2020 18:35, Prep Date: 07/29/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		3.1	20

Inorganics, Prep Batch ID: TKN200729QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN200729QC.LRB1

Run in Batch: TKN200729QC, Run Date: 07/29/2020 12:27, Prep Date: 07/29/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.02	mg/L

Blank (BLK)

Lab Sample ID: TKN200729QC.LRB2

Run in Batch: TKN200729QC, Run Date: 07/29/2020 14:25, Prep Date: 07/29/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN200729QC.LCS1

Run in Batch: TKN200729QC, Run Date: 07/29/2020 14:42, Prep Date: 07/29/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		98	90	110

Matrix Spike (MS)

Lab Sample ID: TKN200729QC.MS1, Parent Sample ID: S16008.01

Run in Batch: TKN200729QC, Run Date: 07/29/2020 14:59, Prep Date: 07/29/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		98	80	120

Duplicate (DUP)

Lab Sample ID: TKN200729QC.DP1, Parent Sample ID: S16008.02

Run in Batch: TKN200729QC, Run Date: 07/29/2020 15:18, Prep Date: 07/29/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		5.4	20

Organics - Volatiles, Prep Batch ID: VS200805W1

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

Blank (BLK)

Lab Sample ID: 200806A9.BLKW06C

Run in Batch: 200806A9, Run Date: 08/06/2020 16:06, Prep Date: 08/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	3.46	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200806A9.LCSW06A

Run in Batch: 200806A9, Run Date: 08/06/2020 10:30, Prep Date: 08/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		92.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200806A9.LCSDW06A, Parent Sample ID: 200806A9.LCSW06A

Run in Batch: 200806A9, Run Date: 08/06/2020 10:51, Prep Date: 08/05/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		92.3	70.0	130.0	0.3	30.0

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

134311

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Marina Samp / Eric Feenstra
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Suite 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 248-994-2318 | FAX NO.: | P.O. NO.:
E-MAIL ADDRESS: marina.samp@arcadis.com + Eric → | QUOTE NO.:

INVOICE TO

CONTACT NAME: | ☑ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: Eric.feenstra@arcadis.com

PROJECT NO./NAME: 30042872.04600 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: A. Mandich / Amyssa Mandich

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	8260B-SIMS 1,2-DCA	E300 Nitrate	4500-Norg/NH3 TKN	SM 4500-PE Total P								
19185.01	7/23/20	1020	MW-20-126_072320	GW	3		X						3											
.02	7/23/20	1225	MW-20-127_072320	GW	3		X						3											
.03	7/23/20	1445	MW-20-128_072320	GW	5		3		1				3	1	1	1								
.04	7/23/20	1615	MW-20-129_072320	GW	3		X						3											

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Amyssa Mandich/Arcadis ☒ Sampler — DATE: 7/23/20 — TIME: 1840
RECEIVED BY: SIGNATURE/ORGANIZATION: [signature] — DATE: 7/23/20 — TIME: 1840
RELINQUISHED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: | TEMP. ON ARRIVAL: 8.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Quality Control Report

Report ID: QC-S16987-01
Generated on 09/11/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S16987.01-S16987.04
Project: RACER Lansing Plant-3
Submitted Date/Time: 08/27/2020 15:35
Sampled by: Billy Cobern
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-5)
Prep Batch Summary (Page 6)
Surrogates per Lab Sample (Pages 7-10)
Surrogates per QC Sample (Page 11)
Batch QC Results (Page 12)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S16987.01
Sample Tag: PW-14-03_082720
Collected Date/Time: 08/27/2020 10:15
Matrix: Groundwater
COC Reference: 127302

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/02/20 16:59	200902A9	VF200902W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S16987.02
Sample Tag: TW-15-11_082720
Collected Date/Time: 08/27/2020 11:30
Matrix: Groundwater
COC Reference: 127302

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/02/20 18:05	200902A9	VF200902W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S16987.03
Sample Tag: MW-13-22_082720
Collected Date/Time: 08/27/2020 12:55
Matrix: Groundwater
COC Reference: 127302

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/02/20 19:34	200902A9	VF200902W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S16987.04
Sample Tag: MW-13-34_082720
Collected Date/Time: 08/27/2020 14:30
Matrix: Groundwater
COC Reference: 127302

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/02/20 19:12	200902A9	VF200902W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF200902W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S16987.01	1,4-Dioxane	SW8260B - SIM	09/02/20 16:59	200902A9
S16987.02	1,4-Dioxane	SW8260B - SIM	09/02/20 18:05	200902A9
S16987.03	1,4-Dioxane	SW8260B - SIM	09/02/20 19:34	200902A9
S16987.04	1,4-Dioxane	SW8260B - SIM	09/02/20 19:12	200902A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S16987.01

Sample Tag: PW-14-03_082720

Collected Date/Time: 08/27/2020 10:15

Matrix: Groundwater

COC Reference: 127302

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200902A9, Run Date: 09/02/2020 16:59, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S16987.02

Sample Tag: TW-15-11_082720

Collected Date/Time: 08/27/2020 11:30

Matrix: Groundwater

COC Reference: 127302

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200902A9, Run Date: 09/02/2020 18:05, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S16987.03

Sample Tag: MW-13-22_082720

Collected Date/Time: 08/27/2020 12:55

Matrix: Groundwater

COC Reference: 127302

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200902A9, Run Date: 09/02/2020 19:34, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S16987.04

Sample Tag: MW-13-34_082720

Collected Date/Time: 08/27/2020 14:30

Matrix: Groundwater

COC Reference: 127302

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200902A9, Run Date: 09/02/2020 19:12, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF200902W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200902A9.BLKW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 12:20, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200902A9.LCSW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 11:17, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200902A9.LCSDW02A, Parent Sample ID: 200902A9.LCSW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 11:38, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VF200902W1

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

Blank (BLK)

Lab Sample ID: 200902A9.BLKW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 12:20, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	1.11	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200902A9.LCSW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 11:17, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		81.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200902A9.LCSDW02A, Parent Sample ID: 200902A9.LCSW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 11:38, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		106.0	70.0	130.0	26.0	30.0

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

127302

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: TIFFANY LINDEN
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR. SUITE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2240 FAX NO.: 248-994-2241 P.O. NO.: 30042872
E-MAIL ADDRESS: TIFFANY.LINDEN@ARCADIS QUOTE NO.:

INVOICE TO

CONTACT NAME ☐ SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME: RACER LANSING PLANT-3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: BRIAN CASE

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane
16987.01	8/27/20	10:15	PW-14-03_082720	GW	3		3						X
.02	8/27/20	11:30	TW-15-11_082720	GW	3		3						X
.03	8/27/20	12:55	MW-13-22_082720	GW	3		3						X
.04	8/27/20	14:30	MW-13-34_082720	GW	3		3						X
.05	—	—	TRIP BLANK_082720	DW	1		1						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	ARCADIS ☒ Sampler	DATE 8.27.20	TIME 15:35	
RECEIVED BY: SIGNATURE/ORGANIZATION	M Ashcraft	DATE 8/27/2020	TIME 1535	
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME	
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME	

RELINQUISHED BY: SIGNATURE/ORGANIZATION			DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE	TIME
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES:	TEMP. ON ARRIVAL 4.2
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS		

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S17055-01
Generated on 09/09/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S17055.01-S17055.03
Project: 30042872 / RACER Lansing Plant 6
Submitted Date/Time: 08/31/2020 18:45
Sampled by: Austin Westhuis
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-4)
Prep Batch Summary (Page 5)
Surrogates per Lab Sample (Pages 6-8)
Surrogates per QC Sample (Page 9)
Batch QC Results (Pages 10-14)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S17055.01
Sample Tag: MW-13-36R_083120
Collected Date/Time: 08/31/2020 14:20
Matrix: Groundwater
COC Reference: 127303

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	09/04/20 19:56	P200904	SF200904W01	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S17055.02
Sample Tag: Dup-02_083120
Collected Date/Time: 08/31/2020 00:01
Matrix: Groundwater
COC Reference: 127303

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	09/04/20 20:27	P200904	SF200904W01	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S17055.03
Sample Tag: MW-13-35_083120
Collected Date/Time: 08/31/2020 16:50
Matrix: Groundwater
COC Reference: 127303

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	09/04/20 20:57	P200904	SF200904W01	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Semi-Volatiles, Prep Batch ID: SF200904W01

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17055.01	Semi-Volatile Organics - MDEQ	SW8270D	09/04/20 19:56	P200904
S17055.02	Semi-Volatile Organics - MDEQ	SW8270D	09/04/20 20:27	P200904
S17055.03	Semi-Volatile Organics - MDEQ	SW8270D	09/04/20 20:57	P200904

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17055.01

Sample Tag: MW-13-36R_083120

Collected Date/Time: 08/31/2020 14:20

Matrix: Groundwater

COC Reference: 127303

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200904, Run Date: 09/04/2020 19:56, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**36.70**	10.0	110.0
2-Fluorobiphenyl		**77.90**	10.0	116.0
Nitrobenzene-D5		**69.00**	10.0	114.0
Phenol-D5		**24.90**	10.0	110.0
2,4,6-Tribromophenol		**92.40**	10.0	123.0
Terphenyl-D14		**95.60**	10.0	141.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17055.02

Sample Tag: Dup-02_083120

Collected Date/Time: 08/31/2020 00:01

Matrix: Groundwater

COC Reference: 127303

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200904, Run Date: 09/04/2020 20:27, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**28.00**	10.0	110.0
2-Fluorobiphenyl		**67.60**	10.0	116.0
Nitrobenzene-D5		**59.60**	10.0	114.0
Phenol-D5		**19.40**	10.0	110.0
2,4,6-Tribromophenol		**78.00**	10.0	123.0
Terphenyl-D14		**73.00**	10.0	141.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17055.03

Sample Tag: MW-13-35_083120

Collected Date/Time: 08/31/2020 16:50

Matrix: Groundwater

COC Reference: 127303

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P200904, Run Date: 09/04/2020 20:57, Matrix: WW, Dilution: 2

Surrogate	Flags	**%Rec**	LCL	UCL
2-Fluorophenol		**29.00**	10.0	110.0
2-Fluorobiphenyl		**46.80**	10.0	116.0
Nitrobenzene-D5		**44.10**	10.0	114.0
Phenol-D5		**20.00**	10.0	110.0
2,4,6-Tribromophenol		**51.90**	10.0	123.0
Terphenyl-D14		**64.60**	10.0	141.0

Organics - Semi-Volatiles, Prep Batch ID: SF200904W01

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: p200904.blkw04a

Run in Batch: P200904, Run Date: 09/04/2020 17:22, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**29.60**	10.0	110.0
2-Fluorobiphenyl		**63.00**	10.0	116.0
Nitrobenzene-D5		**63.00**	10.0	114.0
Phenol-D5		**19.60**	10.0	110.0
2,4,6-Tribromophenol		**77.60**	10.0	123.0
Terphenyl-D14		**72.20**	10.0	141.0

Blank (BLK)

Lab Sample ID: p200908.blkw04a

Run in Batch: P200908, Run Date: 09/08/2020 18:05, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: p200904.lcsw04a

Run in Batch: P200904, Run Date: 09/04/2020 17:53, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**34.60**	10.0	110.0
2-Fluorobiphenyl		**76.60**	10.0	116.0
Nitrobenzene-D5		**75.20**	10.0	114.0
Phenol-D5		**23.40**	10.0	110.0
2,4,6-Tribromophenol		**94.60**	10.0	123.0
Terphenyl-D14		**85.40**	10.0	141.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: p200904.lcsdw04a, Parent Sample ID: p200904.lcsw04a

Run in Batch: P200904, Run Date: 09/04/2020 18:23, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		**35.30**	10.0	110.0
2-Fluorobiphenyl		**79.20**	10.0	116.0
Nitrobenzene-D5		**76.10**	10.0	114.0
Phenol-D5		**23.90**	10.0	110.0
2,4,6-Tribromophenol		**103.20**	10.0	123.0
Terphenyl-D14		**85.80**	10.0	141.0

Organics - Semi-Volatiles, Prep Batch ID: SF200904W01

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

Blank (BLK)

Lab Sample ID: p200904.blkw04a

Run in Batch: P200904, Run Date: 09/04/2020 17:22, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acenaphthylene		ND	0.5	ug/l
Anthracene		ND	0.5	ug/l
Benzo(a)anthracene		ND	0.5	ug/l
Benzo(b)fluoranthene		ND	0.5	ug/l
Benzo(k)fluoranthene		ND	0.5	ug/l
Benzo(ghi)perylene		ND	0.5	ug/l
Benzo(a)pyrene		ND	0.5	ug/l
bis(2-Chloroethoxy)methane		ND	0.5	ug/l
bis(2-Chloroethyl)ether		ND	0.5	ug/l
bis(2-Chloroisopropyl)ether		ND	0.5	ug/l
bis(2-Ethylhexyl)phthalate		ND	0.5	ug/l
4-Bromophenyl phenyl ether		ND	0.5	ug/l
Butyl benzyl phthalate		ND	0.5	ug/l
4-Chloroaniline		ND	0.5	ug/l
2-Chloronaphthalene		ND	0.5	ug/l
4-Chlorophenyl phenyl ether		ND	0.5	ug/l
Chrysene		ND	0.5	ug/l
3-, 4-Methylphenol (p,m-Cresol)		ND	1	ug/l
Dibenzo(ah)anthracene		ND	0.5	ug/l
Dibenzofuran		ND	0.5	ug/l
di-n-Butyl phthalate		ND	0.5	ug/l
1,2-Dichlorobenzene		ND	0.5	ug/l
1,3-Dichlorobenzene		ND	0.5	ug/l
3,3'-Dichlorobenzidine		ND	0.5	ug/l
2,4-Dichlorophenol		ND	0.5	ug/l
Diethyl phthalate		ND	0.5	ug/l
2,4-Dimethylphenol		ND	0.5	ug/l
Dimethyl phthalate		ND	0.5	ug/l
4,6-Dinitro-2-methylphenol		ND	0.5	ug/l
2,4-Dinitrophenol		ND	0.5	ug/l
2,6-Dinitrotoluene		ND	0.5	ug/l
1,2-Diphenylhydrazine		ND	0.5	ug/l
di-n-Octyl phthalate		ND	0.5	ug/l
Fluoranthene		ND	0.5	ug/l
Fluorene		ND	0.5	ug/l
Hexachlorobenzene		ND	0.5	ug/l
Hexachlorobutadiene		ND	0.5	ug/l
Hexachlorocyclopentadiene		ND	0.5	ug/l
Hexachloroethane		ND	0.5	ug/l
Indeno(1,2,3-cd)pyrene		ND	0.5	ug/l
Isophorone		ND	0.5	ug/l
2-Methylnaphthalene		ND	0.5	ug/l
Naphthalene		ND	0.5	ug/l
2-Nitroaniline		ND	0.5	ug/l
3-Nitroaniline		ND	0.5	ug/l
4-Nitroaniline		ND	0.5	ug/l

Organics - Semi-Volatiles, Prep Batch ID: SF200904W01 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: p200904.blkw04a

Run in Batch: P200904, Run Date: 09/04/2020 17:22, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrobenzene		ND	0.5	ug/l
2-Nitrophenol		ND	0.5	ug/l
N-Nitrosodiphenylamine		ND	0.5	ug/l
N-Nitrosodi-n-propylamine		ND	0.5	ug/l
Phenanthrene		ND	0.5	ug/l
2,4,5-Trichlorophenol		ND	0.5	ug/l
2,4,6-Trichlorophenol		ND	0.5	ug/l

Blank (BLK)

Lab Sample ID: p200908.blkw04a

Run in Batch: P200908, Run Date: 09/08/2020 18:05, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Benzo(a)pyrene		ND	0.01	ug/l
Hexachlorobenzene		ND	0.01	ug/l
Hexachlorobutadiene		ND	0.01	ug/l
Hexachlorocyclopentadiene		ND	0.01	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: p200904.lcsw04a

Run in Batch: P200904, Run Date: 09/04/2020 17:53, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		102.86	34.8	124.7
Acenaphthylene		109.48	16.9	140.7
Anthracene		109.86	38.1	115.5
Benzo(a)anthracene		111.14	40.7	115.5
Benzo(b)fluoranthene		107.72	43.3	119.4
Benzo(k)fluoranthene		100.04	41.2	116.9
Benzo(ghi)perylene		105.96	36.7	122.1
Benzo(a)pyrene		105.72	51.2	133.4
bis(2-Chloroethoxy)methane		101.34	48.3	105.4
bis(2-Chloroethyl)ether		86.54	43.4	101.8
bis(2-Chloroisopropyl)ether		65.84	33.2	105.8
bis(2-Ethylhexyl)phthalate		105.02	45.2	126.2
4-Bromophenyl phenyl ether	*	117.42	44.5	116.9
Butyl benzyl phthalate		103.80	47.4	121.6
4-Chloroaniline		88.64	33.4	89.4
2-Chloronaphthalene		100.14	50.3	108.3
4-Chloro-3-methylphenol		100.98	39.0	123.2
2-Chlorophenol		87.78	35.5	114.1
4-Chlorophenyl phenyl ether		106.52	52.2	116.5
Chrysene		114.54	28.9	136.7
3-, 4-Methylphenol (p,m-Cresol)		61.36	36.4	115.4
Dibenzo(ah)anthracene		101.42	33.8	132.4
Dibenzofuran		110.06	52.1	111.9
di-n-Butyl phthalate		115.68	48.1	121.8
1,2-Dichlorobenzene		77.64	9.6	166.2

Organics - Semi-Volatiles, Prep Batch ID: SF200904W01 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: p200904.lcsw04a

Run in Batch: P200904, Run Date: 09/04/2020 17:53, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,3-Dichlorobenzene		73.42	36.8	105.8
1,4-Dichlorobenzene		73.92	20.7	137.7
3,3'-Dichlorobenzidine	*	105.44	26.1	103.7
2,4-Dichlorophenol		102.36	57.7	115.6
Diethyl phthalate		112.48	48.1	118.0
2,4-Dimethylphenol		102.62	43.4	114.9
Dimethyl phthalate		113.20	49.3	118.4
4,6-Dinitro-2-methylphenol		97.72	18.7	149.0
2,4-Dinitrophenol		31.04	10.0	171.2
2,4-Dinitrotoluene		111.82	35.8	126.7
2,6-Dinitrotoluene		112.90	48.0	119.1
1,2-Diphenylhydrazine		109.78	40.2	136.4
di-n-Octyl phthalate		102.56	45.7	123.1
Fluoranthene		117.78	43.0	127.9
Fluorene		108.78	37.1	110.3
Hexachlorobenzene	*	121.68	45.2	118.5
Hexachlorobutadiene		84.34	30.2	119.4
Hexachlorocyclopentadiene		61.42	10.0	271.8
Hexachloroethane		67.56	23.8	138.1
Indeno(1,2,3-cd)pyrene		107.32	41.5	116.9
Isophorone		98.66	44.9	107.5
2-Methylnaphthalene		96.62	25.5	165.5
Naphthalene		91.06	32.9	135.8
2-Nitroaniline		107.18	53.4	119.9
3-Nitroaniline		93.50	42.1	109.0
4-Nitroaniline		94.80	45.8	119.7
Nitrobenzene		92.76	41.7	110.1
2-Nitrophenol		100.72	54.4	109.5
4-Nitrophenol		49.70	15.4	122.0
N-Nitrosodiphenylamine	*	115.04	10.0	104.2
N-Nitrosodi-n-propylamine		93.92	35.8	109.3
Pentachlorophenol		101.76	10.3	139.1
Phenanthrene		105.96	31.8	123.3
Phenol		32.50	10.0	130.4
Pyrene		109.14	37.8	131.4
1,2,4-Trichlorobenzene		89.66	32.2	118.4
2,4,5-Trichlorophenol		113.44	48.9	118.8
2,4,6-Trichlorophenol		108.38	47.8	117.4

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: p200904.lcsdw04a, Parent Sample ID: p200904.lcsw04a

Run in Batch: P200904, Run Date: 09/04/2020 18:23, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		106.44	34.8	124.7	3.4	30.0
Acenaphthylene		109.88	16.9	140.7	0.4	30.0
Anthracene		111.02	38.1	115.5	1.1	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF200904W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: p200904.lcsdw04a, Parent Sample ID: p200904.lcsw04a

Run in Batch: P200904, Run Date: 09/04/2020 18:23, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Benzo(a)anthracene		111.54	40.7	115.5	0.4	30.0
Benzo(b)fluoranthene		108.24	43.3	119.4	0.5	30.0
Benzo(k)fluoranthene		103.68	41.2	116.9	3.6	30.0
Benzo(ghi)perylene		107.20	36.7	122.1	1.2	30.0
Benzo(a)pyrene		105.00	51.2	133.4	0.7	30.0
bis(2-Chloroethoxy)methane		103.04	48.3	105.4	1.7	30.0
bis(2-Chloroethyl)ether		88.36	43.4	101.8	2.1	30.0
bis(2-Chloroisopropyl)ether		66.62	33.2	105.8	1.2	30.0
bis(2-Ethylhexyl)phthalate		105.22	45.2	126.2	0.2	30.0
4-Bromophenyl phenyl ether		116.72	44.5	116.9	0.6	30.0
Butyl benzyl phthalate		105.58	47.4	121.6	1.7	30.0
4-Chloroaniline		88.42	33.4	89.4	0.2	30.0
2-Chloronaphthalene		105.42	50.3	108.3	5.1	30.0
4-Chloro-3-methylphenol		105.40	39.0	123.2	4.3	30.0
2-Chlorophenol		88.78	35.5	114.1	1.1	30.0
4-Chlorophenyl phenyl ether		110.88	52.2	116.5	4.0	30.0
Chrysene		110.96	28.9	136.7	3.2	30.0
3-, 4-Methylphenol (p,m-Cresol)		62.59	36.4	115.4	2.0	30.0
Dibenzo(ah)anthracene		99.56	33.8	132.4	1.9	30.0
Dibenzofuran		111.28	52.1	111.9	1.1	30.0
di-n-Butyl phthalate		118.46	48.1	121.8	2.4	30.0
1,2-Dichlorobenzene		78.88	9.6	166.2	1.6	30.0
1,3-Dichlorobenzene		73.80	36.8	105.8	0.5	30.0
1,4-Dichlorobenzene		74.22	20.7	137.7	0.4	30.0
3,3'-Dichlorobenzidine		102.08	26.1	103.7	3.2	30.0
2,4-Dichlorophenol		106.54	57.7	115.6	4.0	30.0
Diethyl phthalate		114.30	48.1	118.0	1.6	30.0
2,4-Dimethylphenol		104.12	43.4	114.9	1.5	30.0
Dimethyl phthalate		115.34	49.3	118.4	1.9	30.0
4,6-Dinitro-2-methylphenol		100.78	18.7	149.0	3.1	30.0
2,4-Dinitrophenol		32.96	10.0	171.2	6.0	30.0
2,4-Dinitrotoluene		116.14	35.8	126.7	3.8	30.0
2,6-Dinitrotoluene		114.58	48.0	119.1	1.5	30.0
1,2-Diphenylhydrazine		108.06	40.2	136.4	1.6	30.0
di-n-Octyl phthalate		103.96	45.7	123.1	1.4	30.0
Fluoranthene		119.26	43.0	127.9	1.2	30.0
Fluorene		108.72	37.1	110.3	0.1	30.0
Hexachlorobenzene	*	131.52	45.2	118.5	7.8	30.0
Hexachlorobutadiene		87.96	30.2	119.4	4.2	30.0
Hexachlorocyclopentadiene		61.12	10.0	271.8	0.5	30.0
Hexachloroethane		68.48	23.8	138.1	1.4	30.0
Indeno(1,2,3-cd)pyrene		108.70	41.5	116.9	1.3	30.0
Isophorone		101.26	44.9	107.5	2.6	30.0
2-Methylnaphthalene		97.00	25.5	165.5	0.4	30.0
Naphthalene		92.54	32.9	135.8	1.6	30.0
2-Nitroaniline		107.78	53.4	119.9	0.6	30.0

Organics - Semi-Volatiles, Prep Batch ID: SF200904W01 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: p200904.lcsdw04a, Parent Sample ID: p200904.lcsw04a

Run in Batch: P200904, Run Date: 09/04/2020 18:23, Prep Date: 09/04/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
3-Nitroaniline		96.54	42.1	109.0	3.2	30.0
4-Nitroaniline		96.48	45.8	119.7	1.8	30.0
Nitrobenzene		94.60	41.7	110.1	2.0	30.0
2-Nitrophenol		103.98	54.4	109.5	3.2	30.0
4-Nitrophenol		50.48	15.4	122.0	1.6	30.0
N-Nitrosodiphenylamine	*	116.34	10.0	104.2	1.1	30.0
N-Nitrosodi-n-propylamine		95.68	35.8	109.3	1.9	30.0
Pentachlorophenol		102.72	10.3	139.1	0.9	30.0
Phenanthrene		107.64	31.8	123.3	1.6	30.0
Phenol		32.22	10.0	130.4	0.9	30.0
Pyrene		107.86	37.8	131.4	1.2	30.0
1,2,4-Trichlorobenzene		91.52	32.2	118.4	2.1	30.0
2,4,5-Trichlorophenol	*	119.76	48.9	118.8	5.4	30.0
2,4,6-Trichlorophenol		113.70	47.8	117.4	4.8	30.0

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C.O.C. PAGE # 1 OF 1

127303

CHAIN OF CUSTODY RECORD Plant 6

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 810-225-1928 FAX NO.: 248-994-2241 P.O. NO.: 30042872
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: [X] SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / RACER Lansing Plant 6
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS [X] STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	SVOCs
170550 1	8/31/20	1420	MW-13-36R_083120	GW	2	2							X
.02	8/31/20	—	Dup-02_083120	GW	2	2							X
.03	8/31/20	1650	MW-13-35_083120	GW	2	2							X
.04	8/31/20	—	Trip Blank	GW	1		1						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	[signature] / Arcadis [X] Sampler	8/31/20	1815
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Sample Drop Box	8/31/20	1815
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	8/31/20	1845
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	8/31/20	1845

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S17056-01
Generated on 09/14/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S17056.01-S17056.02
Project: RACER Lansing (Plant 3)
Submitted Date/Time: 08/31/2020 18:45
Sampled by: Billy Cobern
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-3)
Prep Batch Summary (Page 4)
Surrogates per Lab Sample (Pages 5-6)
Surrogates per QC Sample (Page 7)
Batch QC Results (Pages 8-11)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S17056.01
Sample Tag: TW-14-06_083120
Collected Date/Time: 08/31/2020 10:05
Matrix: Groundwater
COC Reference: 127304

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	09/01/20 09:05	NTRA200901-W1-B	NTRA200901-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 18:45	TKN200901QC	TKN200901QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	09/02/20 18:02	PHS200902QC	PHS200902QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 14:39	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S17056.02
Sample Tag: Dup-03_083120
Collected Date/Time: 08/31/2020 00:01
Matrix: Groundwater
COC Reference: 127304

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	09/01/20 09:18	NTRA200901-W1-B	NTRA200901-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 19:13	TKN200901QC	TKN200901QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	09/02/20 18:09	PHS200902QC	PHS200902QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 15:02	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: NTRA200901-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17056.01	Nitrate-N	E300.0	09/01/20 09:05	NTRA200901-W1-B
S17056.02	Nitrate-N	E300.0	09/01/20 09:18	NTRA200901-W1-B

Inorganics, Prep Batch ID: PHS200902QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17056.01	Total Phosphorus	SM4500-PE	09/02/20 18:02	PHS200902QC
S17056.02	Total Phosphorus	SM4500-PE	09/02/20 18:09	PHS200902QC

Inorganics, Prep Batch ID: TKN200901QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17056.01	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 18:45	TKN200901QC
S17056.02	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 19:13	TKN200901QC

Organics - Volatiles, Prep Batch ID: VS200911W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17056.01	1,4-Dioxane	SW8260B - SIM	09/11/20 14:39	200911A9
S17056.02	1,4-Dioxane	SW8260B - SIM	09/11/20 15:02	200911A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17056.01

Sample Tag: TW-14-06_083120

Collected Date/Time: 08/31/2020 10:05

Matrix: Groundwater

COC Reference: 127304

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 14:39, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17056.02

Sample Tag: Dup-03_083120

Collected Date/Time: 08/31/2020 00:01

Matrix: Groundwater

COC Reference: 127304

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 15:02, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D	*	**50.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200911W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200911A9.BLKW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 14:17, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:32, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200911A9.LCSDW11A, Parent Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:53, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

Inorganics, Prep Batch ID: NTRA200901-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA200901-W1-B.LRB1

Run in Batch: NTRA200901-W1-B, Run Date: 09/01/2020 08:27, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA200901-W1-B.LCS1

Run in Batch: NTRA200901-W1-B, Run Date: 09/01/2020 08:52, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		96	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA200901-W1-B.MS1, Parent Sample ID: S17056.01

Run in Batch: NTRA200901-W1-B, Run Date: 09/01/2020 10:35, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		100	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA200901-W1-B.MSD1, Parent Sample ID: NTRA200901-W1-B.MS1

Run in Batch: NTRA200901-W1-B, Run Date: 09/01/2020 10:48, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		101	80	120	1	15

Duplicate (DUP)

Lab Sample ID: NTRA200901-W1-B.DP1, Parent Sample ID: S17056.01

Run in Batch: NTRA200901-W1-B, Run Date: 09/01/2020 10:22, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	RPD	RPD CL
Nitrate-N		<1	15

Inorganics, Prep Batch ID: PHS200902QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS200902QC.LRB1

Run in Batch: PHS200902QC, Run Date: 09/02/2020 14:58, Prep Date: 09/02/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS200902QC.LRB2

Run in Batch: PHS200902QC, Run Date: 09/02/2020 15:05, Prep Date: 09/02/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS200902QC.LCS1

Run in Batch: PHS200902QC, Run Date: 09/02/2020 15:12, Prep Date: 09/02/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		99	90	110

Matrix Spike (MS)

Lab Sample ID: PHS200902QC.MS1, Parent Sample ID: S16933.01

Run in Batch: PHS200902QC, Run Date: 09/02/2020 18:35, Prep Date: 09/02/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		103	80	120

Duplicate (DUP)

Lab Sample ID: PHS200902QC.DP1, Parent Sample ID: S17028.02

Run in Batch: PHS200902QC, Run Date: 09/02/2020 18:32, Prep Date: 09/02/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		3.0	20

Inorganics, Prep Batch ID: TKN200901QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN200901QC.LRB1

Run in Batch: TKN200901QC, Run Date: 09/01/2020 11:08, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.02	mg/L

Blank (BLK)

Lab Sample ID: TKN200901QC.LRB2

Run in Batch: TKN200901QC, Run Date: 09/01/2020 17:03, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN200901QC.LCS1

Run in Batch: TKN200901QC, Run Date: 09/01/2020 17:23, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		97	90	110

Matrix Spike (MS)

Lab Sample ID: TKN200901QC.MS1, Parent Sample ID: S17051.02

Run in Batch: TKN200901QC, Run Date: 09/01/2020 18:02, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		96	80	120

Duplicate (DUP)

Lab Sample ID: TKN200901QC.DP1, Parent Sample ID: S17051.01

Run in Batch: TKN200901QC, Run Date: 09/01/2020 17:42, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		2.3	20

Organics - Volatiles, Prep Batch ID: VS200911W1

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

Blank (BLK)

Lab Sample ID: 200911A9.BLKW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 14:17, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.91	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:32, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		84.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200911A9.LCSDW11A, Parent Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:53, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.3	70.0	130.0	10.8	30.0

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www.meritlabs.com

C.O.C. PAGE # 1 OF 1

127304

CHAIN OF CUSTODY RECORD Plant 3

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Ste 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2240 FAX NO.: 248-994-2241 P.O. NO.: 30042872
E-MAIL ADDRESS: Tiffany.Linder@Arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: Racer Lansing (Plant-3)
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Billy J. Green

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane	TKN, Total Phosphorus	Nitrate
1705601	8/31/20	10:05	TW-14-06_083120	GW	5	1	3		1				3	1	1
.02	8/31/20	—	DUP-03_083120	GW	5	1	3		1				3	1	1

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis ☒ Sampler DATE: 8-31-20 TIME: 1740
RECEIVED BY: SIGNATURE/ORGANIZATION: Arcadis DATE: 8/31/20 TIME: 1740
RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit DMP BOX DATE: 8/31/20 TIME: 1845
RECEIVED BY: DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis DATE: 8/31/20 TIME: 1815
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Sample Drop Box DATE: 8/31/20 TIME: 1815

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT INITIALS

NOTES: TEMP. ON ARRIVAL: 4.1

Quality Control Report

Report ID: QC-S17057-01
Generated on 09/14/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S17057.01-S17057.04
Project: RACER Lansing (Plant-2)
Submitted Date/Time: 08/31/2020 18:45
Sampled by: Billy Cobern
P.O. #: 30042872

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-5)
Prep Batch Summary (Page 6)
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Surrogates per QC Sample (Pages 11-12)
Batch QC Results (Pages 13-17)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S17057.01
Sample Tag: MW-19-121_083120
Collected Date/Time: 08/31/2020 11:45
Matrix: Groundwater
COC Reference: 127305

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	09/01/20 09:31	NTRA200901-W1-B	NTRA200901-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 19:33	TKN200901QC	TKN200901QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	09/02/20 18:13	PHS200902QC	PHS200902QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 15:24	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S17057.02
Sample Tag: MW-14-61_083120
Collected Date/Time: 08/31/2020 13:00
Matrix: Groundwater
COC Reference: 127305

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	09/01/20 09:44	NTRA200901-W1-B	NTRA200901-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 22:22	TKN200901QC	TKN200901QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	09/02/20 18:19	PHS200902QC	PHS200902QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/02/20 20:18	200902A9	VF200902W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S17057.03
Sample Tag: MW-20-127_083120
Collected Date/Time: 08/31/2020 14:15
Matrix: Groundwater
COC Reference: 127305

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	09/01/20 09:56	NTRA200901-W1-B	NTRA200901-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 22:42	TKN200901QC	TKN200901QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	09/02/20 18:24	PHS200902QC	PHS200902QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/02/20 18:49	200902A9	VF200902W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S17057.04
Sample Tag: TW-15-12_083120
Collected Date/Time: 08/31/2020 15:45
Matrix: Groundwater
COC Reference: 127305

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	09/01/20 10:09	NTRA200901-W1-B	NTRA200901-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 23:04	TKN200901QC	TKN200901QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	09/02/20 18:29	PHS200902QC	PHS200902QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/02/20 18:27	200902A9	VF200902W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: NTRA200901-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17057.01	Nitrate-N	E300.0	09/01/20 09:31	NTRA200901-W1-B
S17057.02	Nitrate-N	E300.0	09/01/20 09:44	NTRA200901-W1-B
S17057.03	Nitrate-N	E300.0	09/01/20 09:56	NTRA200901-W1-B
S17057.04	Nitrate-N	E300.0	09/01/20 10:09	NTRA200901-W1-B

Inorganics, Prep Batch ID: PHS200902QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17057.01	Total Phosphorus	SM4500-PE	09/02/20 18:13	PHS200902QC
S17057.02	Total Phosphorus	SM4500-PE	09/02/20 18:19	PHS200902QC
S17057.03	Total Phosphorus	SM4500-PE	09/02/20 18:24	PHS200902QC
S17057.04	Total Phosphorus	SM4500-PE	09/02/20 18:29	PHS200902QC

Inorganics, Prep Batch ID: TKN200901QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17057.01	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 19:33	TKN200901QC
S17057.02	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 22:22	TKN200901QC
S17057.03	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 22:42	TKN200901QC
S17057.04	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	09/01/20 23:04	TKN200901QC

Organics - Volatiles, Prep Batch ID: VF200902W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17057.02	1,4-Dioxane	SW8260B - SIM	09/02/20 20:18	200902A9
S17057.03	1,4-Dioxane	SW8260B - SIM	09/02/20 18:49	200902A9
S17057.04	1,4-Dioxane	SW8260B - SIM	09/02/20 18:27	200902A9

Organics - Volatiles, Prep Batch ID: VS200911W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17057.01	1,4-Dioxane	SW8260B - SIM	09/11/20 15:24	200911A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17057.01

Sample Tag: MW-19-121_083120

Collected Date/Time: 08/31/2020 11:45

Matrix: Groundwater

COC Reference: 127305

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 15:24, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17057.02

Sample Tag: MW-14-61_083120

Collected Date/Time: 08/31/2020 13:00

Matrix: Groundwater

COC Reference: 127305

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200902A9, Run Date: 09/02/2020 20:18, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17057.03

Sample Tag: MW-20-127_083120

Collected Date/Time: 08/31/2020 14:15

Matrix: Groundwater

COC Reference: 127305

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200902A9, Run Date: 09/02/2020 18:49, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17057.04

Sample Tag: TW-15-12_083120

Collected Date/Time: 08/31/2020 15:45

Matrix: Groundwater

COC Reference: 127305

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200902A9, Run Date: 09/02/2020 18:27, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF200902W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200902A9.BLKW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 12:20, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200902A9.LCSW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 11:17, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200902A9.LCSDW02A, Parent Sample ID: 200902A9.LCSW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 11:38, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200911W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200911A9.BLKW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 14:17, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:32, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200911A9.LCSDW11A, Parent Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:53, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

Inorganics, Prep Batch ID: NTRA200901-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA200901-W1-B.LRB1

Run in Batch: NTRA200901-W1-B, Run Date: 09/01/2020 08:27, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA200901-W1-B.LCS1

Run in Batch: NTRA200901-W1-B, Run Date: 09/01/2020 08:52, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		96	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA200901-W1-B.MS1, Parent Sample ID: S17056.01

Run in Batch: NTRA200901-W1-B, Run Date: 09/01/2020 10:35, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		100	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA200901-W1-B.MSD1, Parent Sample ID: NTRA200901-W1-B.MS1

Run in Batch: NTRA200901-W1-B, Run Date: 09/01/2020 10:48, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		101	80	120	1	15

Duplicate (DUP)

Lab Sample ID: NTRA200901-W1-B.DP1, Parent Sample ID: S17056.01

Run in Batch: NTRA200901-W1-B, Run Date: 09/01/2020 10:22, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	RPD	RPD CL
Nitrate-N		<1	15

Inorganics, Prep Batch ID: PHS200902QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS200902QC.LRB1

Run in Batch: PHS200902QC, Run Date: 09/02/2020 14:58, Prep Date: 09/02/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS200902QC.LRB2

Run in Batch: PHS200902QC, Run Date: 09/02/2020 15:05, Prep Date: 09/02/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS200902QC.LCS1

Run in Batch: PHS200902QC, Run Date: 09/02/2020 15:12, Prep Date: 09/02/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		99	90	110

Matrix Spike (MS)

Lab Sample ID: PHS200902QC.MS1, Parent Sample ID: S16933.01

Run in Batch: PHS200902QC, Run Date: 09/02/2020 18:35, Prep Date: 09/02/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		103	80	120

Duplicate (DUP)

Lab Sample ID: PHS200902QC.DP1, Parent Sample ID: S17028.02

Run in Batch: PHS200902QC, Run Date: 09/02/2020 18:32, Prep Date: 09/02/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		3.0	20

Inorganics, Prep Batch ID: TKN200901QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN200901QC.LRB1

Run in Batch: TKN200901QC, Run Date: 09/01/2020 11:08, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.02	mg/L

Blank (BLK)

Lab Sample ID: TKN200901QC.LRB2

Run in Batch: TKN200901QC, Run Date: 09/01/2020 17:03, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN200901QC.LCS1

Run in Batch: TKN200901QC, Run Date: 09/01/2020 17:23, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		97	90	110

Matrix Spike (MS)

Lab Sample ID: TKN200901QC.MS1, Parent Sample ID: S17051.02

Run in Batch: TKN200901QC, Run Date: 09/01/2020 18:02, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		96	80	120

Duplicate (DUP)

Lab Sample ID: TKN200901QC.DP1, Parent Sample ID: S17051.01

Run in Batch: TKN200901QC, Run Date: 09/01/2020 17:42, Prep Date: 09/01/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		2.3	20

Organics - Volatiles, Prep Batch ID: VF200902W1

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

Blank (BLK)

Lab Sample ID: 200902A9.BLKW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 12:20, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	1.11	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200902A9.LCSW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 11:17, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		81.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200902A9.LCSDW02A, Parent Sample ID: 200902A9.LCSW02A

Run in Batch: 200902A9, Run Date: 09/02/2020 11:38, Prep Date: 09/02/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		106.0	70.0	130.0	26.0	30.0

Organics - Volatiles, Prep Batch ID: VS200911W1

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

Blank (BLK)

Lab Sample ID: 200911A9.BLKW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 14:17, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.91	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:32, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		84.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200911A9.LCSDW11A, Parent Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:53, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.3	70.0	130.0	10.8	30.0

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

127305

CHAIN OF CUSTODY RECORD Plant 2

REPORT TO

CONTACT NAME: TIFFANY LINDER
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR SUITE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2240 FAX NO.: 248-994-2241 P.O. NO.: 30042872
E-MAIL ADDRESS: TIFFANY.LINDER@ARCADIS.COM QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: ROGEN LANSING (PLANT-2)
SAMPLER(S) - PLEASE PRINT/SIGN NAME: BILLY J. CAGER

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 DIOXANE	NITRATE	TKN/TOTAL PHOSPHORUS
170570 1	8/31/20	11:45	MW-19-121_083120	GW	5	1	3		1				3	1	1
02	8/31/20	13:00	MW-14-61_083120	GW	5	1	3		1				3	1	1
03	8/31/20	14:15	MW-20-127_083120	GW	5	1	3		1				3	1	1
04	8/31/20	15:45	TW-15-12_083120	GW	5	1	3		1				3	1	1

RELINQUISHED BY: SIGNATURE/ORGANIZATION	ARCADIS	☒ Sampler	DATE 8.31.20	TIME 1740
RECEIVED BY: SIGNATURE/ORGANIZATION	Arcadis		DATE 8/31/20	TIME 1740
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box		DATE 8/31/20	TIME 1845
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE 8/31/20	TIME 1845

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis		DATE 8/31/20	TIME 1815
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Sample Drop Box		DATE 8/31/20	TIME 1815

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S17121-01
Generated on 09/17/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S17121.01-S17121.21
Project: 30042872.04700 / RACER Lansing Plant 2
Submitted Date/Time: 09/02/2020 14:30
Sampled by: Billy Cobern / Austin Westhuis
P.O. #: 30042872.04700

QC Report Sections

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Surrogates per QC Sample (Pages 36-37)
Batch QC Results (Pages 38-39)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S17121.01
Sample Tag: MW-17-86_090120
Collected Date/Time: 09/01/2020 09:35
Matrix: Groundwater
COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 16:08	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.02

Sample Tag: MW-17-86_090120 MS

Collected Date/Time: 09/01/2020 09:35

Matrix: Groundwater

COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 13:14	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.03

Sample Tag: MW-17-86_090120 MSD

Collected Date/Time: 09/01/2020 09:35

Matrix: Groundwater

COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 13:35	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.04

Sample Tag: MW-16-84_090120

Collected Date/Time: 09/01/2020 10:55

Matrix: Groundwater

COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 16:30	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.05

Sample Tag: MW-20-129_090120

Collected Date/Time: 09/01/2020 12:05

Matrix: Groundwater

COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 16:53	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.06

Sample Tag: MW-19-115_090120

Collected Date/Time: 09/01/2020 13:30

Matrix: Groundwater

COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 17:15	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.07

Sample Tag: MW-15-72_090120

Collected Date/Time: 09/01/2020 15:05

Matrix: Groundwater

COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 21:19	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.08

Sample Tag: MW-19-117_090220

Collected Date/Time: 09/02/2020 09:45

Matrix: Groundwater

COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 17:37	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.09

Sample Tag: MW-19-116_090220

Collected Date/Time: 09/02/2020 10:55

Matrix: Groundwater

COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 17:59	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.10

Sample Tag: PW-14-02_090220

Collected Date/Time: 09/02/2020 12:20

Matrix: Groundwater

COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 18:21	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.11

Sample Tag: MW-20-126_090220

Collected Date/Time: 09/02/2020 13:45

Matrix: Groundwater

COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/15/20 15:22	200915A9	VS200915W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.12

Sample Tag: Dup-01_090220

Collected Date/Time: 09/02/2020 00:01

Matrix: Groundwater

COC Reference: 127307

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/15/20 15:00	200915A9	VS200915W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.13

Sample Tag: MW-19-123_090120

Collected Date/Time: 09/01/2020 09:55

Matrix: Groundwater

COC Reference: 127306

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 19:05	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.14

Sample Tag: TW-14-02_090120

Collected Date/Time: 09/01/2020 11:25

Matrix: Groundwater

COC Reference: 127306

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/15/20 13:31	200915A9	VS200915W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.15

Sample Tag: MW-16-74_090120

Collected Date/Time: 09/01/2020 13:10

Matrix: Groundwater

COC Reference: 127306

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/15/20 13:53	200915A9	VS200915W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.16

Sample Tag: MW-20-128_090120

Collected Date/Time: 09/01/2020 14:35

Matrix: Groundwater

COC Reference: 127306

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 19:50	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.17

Sample Tag: MW-19-122_090220

Collected Date/Time: 09/02/2020 09:00

Matrix: Groundwater

COC Reference: 127306

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 20:12	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.18

Sample Tag: MW-16-81_090220

Collected Date/Time: 09/02/2020 10:25

Matrix: Groundwater

COC Reference: 127306

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/15/20 15:45	200915A9	VS200915W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.19

Sample Tag: Dup-02_090220

Collected Date/Time: 09/02/2020 00:01

Matrix: Groundwater

COC Reference: 127306

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/15/20 16:07	200915A9	VS200915W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.20

Sample Tag: MW-19-124_090220

Collected Date/Time: 09/02/2020 11:35

Matrix: Groundwater

COC Reference: 127306

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/15/20 16:29	200915A9	VS200915W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S17121.21

Sample Tag: MW-19-120_090220

Collected Date/Time: 09/02/2020 12:55

Matrix: Groundwater

COC Reference: 127306

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	09/11/20 20:56	200911A9	VS200911W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS200911W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17121.01	1,4-Dioxane	SW8260B - SIM	09/11/20 16:08	200911A9
S17121.02	1,4-Dioxane	SW8260B - SIM	09/11/20 13:14	200911A9
S17121.03	1,4-Dioxane	SW8260B - SIM	09/11/20 13:35	200911A9
S17121.04	1,4-Dioxane	SW8260B - SIM	09/11/20 16:30	200911A9
S17121.05	1,4-Dioxane	SW8260B - SIM	09/11/20 16:53	200911A9
S17121.06	1,4-Dioxane	SW8260B - SIM	09/11/20 17:15	200911A9
S17121.07	1,4-Dioxane	SW8260B - SIM	09/11/20 21:19	200911A9
S17121.08	1,4-Dioxane	SW8260B - SIM	09/11/20 17:37	200911A9
S17121.09	1,4-Dioxane	SW8260B - SIM	09/11/20 17:59	200911A9
S17121.10	1,4-Dioxane	SW8260B - SIM	09/11/20 18:21	200911A9
S17121.13	1,4-Dioxane	SW8260B - SIM	09/11/20 19:05	200911A9
S17121.16	1,4-Dioxane	SW8260B - SIM	09/11/20 19:50	200911A9
S17121.17	1,4-Dioxane	SW8260B - SIM	09/11/20 20:12	200911A9
S17121.21	1,4-Dioxane	SW8260B - SIM	09/11/20 20:56	200911A9

Organics - Volatiles, Prep Batch ID: VS200915W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17121.11	1,4-Dioxane	SW8260B - SIM	09/15/20 15:22	200915A9
S17121.12	1,4-Dioxane	SW8260B - SIM	09/15/20 15:00	200915A9
S17121.14	1,4-Dioxane	SW8260B - SIM	09/15/20 13:31	200915A9
S17121.15	1,4-Dioxane	SW8260B - SIM	09/15/20 13:53	200915A9
S17121.18	1,4-Dioxane	SW8260B - SIM	09/15/20 15:45	200915A9
S17121.19	1,4-Dioxane	SW8260B - SIM	09/15/20 16:07	200915A9
S17121.20	1,4-Dioxane	SW8260B - SIM	09/15/20 16:29	200915A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.01

Sample Tag: MW-17-86_090120

Collected Date/Time: 09/01/2020 09:35

Matrix: Groundwater

COC Reference: 127307

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 16:08, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.04

Sample Tag: MW-16-84_090120

Collected Date/Time: 09/01/2020 10:55

Matrix: Groundwater

COC Reference: 127307

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 16:30, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.05

Sample Tag: MW-20-129_090120

Collected Date/Time: 09/01/2020 12:05

Matrix: Groundwater

COC Reference: 127307

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 16:53, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.06

Sample Tag: MW-19-115_090120

Collected Date/Time: 09/01/2020 13:30

Matrix: Groundwater

COC Reference: 127307

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 17:15, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.07

Sample Tag: MW-15-72_090120

Collected Date/Time: 09/01/2020 15:05

Matrix: Groundwater

COC Reference: 127307

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 21:19, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.08

Sample Tag: MW-19-117_090220

Collected Date/Time: 09/02/2020 09:45

Matrix: Groundwater

COC Reference: 127307

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 17:37, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.09

Sample Tag: MW-19-116_090220

Collected Date/Time: 09/02/2020 10:55

Matrix: Groundwater

COC Reference: 127307

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 17:59, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.10

Sample Tag: PW-14-02_090220

Collected Date/Time: 09/02/2020 12:20

Matrix: Groundwater

COC Reference: 127307

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 18:21, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.13

Sample Tag: MW-19-123_090120

Collected Date/Time: 09/01/2020 09:55

Matrix: Groundwater

COC Reference: 127306

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 19:05, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.16

Sample Tag: MW-20-128_090120

Collected Date/Time: 09/01/2020 14:35

Matrix: Groundwater

COC Reference: 127306

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 19:50, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D	*	**50.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.17

Sample Tag: MW-19-122_090220

Collected Date/Time: 09/02/2020 09:00

Matrix: Groundwater

COC Reference: 127306

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 20:12, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S17121.21

Sample Tag: MW-19-120_090220

Collected Date/Time: 09/02/2020 12:55

Matrix: Groundwater

COC Reference: 127306

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200911A9, Run Date: 09/11/2020 20:56, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200911W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200911A9.BLKW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 14:17, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:32, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200911A9.LCSDW11A, Parent Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:53, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D		**70.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200915W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200915A9.BLKW15A

Run in Batch: 200915A9, Run Date: 09/15/2020 13:09, Prep Date: 09/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 200915A9.LCSW15A

Run in Batch: 200915A9, Run Date: 09/15/2020 12:06, Prep Date: 09/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200915A9.LCSDW15A, Parent Sample ID: 200915A9.LCSW15A

Run in Batch: 200915A9, Run Date: 09/15/2020 12:27, Prep Date: 09/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS200911W1

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

Blank (BLK)

Lab Sample ID: 200911A9.BLKW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 14:17, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.91	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:32, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		84.6	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200911A9.LCSDW11A, Parent Sample ID: 200911A9.LCSW11A

Run in Batch: 200911A9, Run Date: 09/11/2020 12:53, Prep Date: 09/11/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		94.3	70.0	130.0	10.8	30.0

Organics - Volatiles, Prep Batch ID: VS200915W1

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

Blank (BLK)

Lab Sample ID: 200915A9.BLKW15A

Run in Batch: 200915A9, Run Date: 09/15/2020 13:09, Prep Date: 09/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200915A9.LCSW15A

Run in Batch: 200915A9, Run Date: 09/15/2020 12:06, Prep Date: 09/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		87.3	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200915A9.LCSDW15A, Parent Sample ID: 200915A9.LCSW15A

Run in Batch: 200915A9, Run Date: 09/15/2020 12:27, Prep Date: 09/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		98.4	70.0	130.0	12.0	30.0

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C.O.C. PAGE # 1 OF 2

127307

CHAIN OF CUSTODY RECORD Plant 2

REPORT TO

CONTACT NAME: TIFFANY LINDEN
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR. STE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO: 248-994-2240 FAX NO: 248-994-2241 PO NO: 30042872
E-MAIL ADDRESS: TIFFANY.LINDEN@ARCADIS.COM QUOTE NO.

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER LANSING
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Billy J. Cosgal

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

1,4-Dioxane 8260 SIM

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260 SIM	Special Instructions
01/02/.03	9/1/20	9:35	MW-17-86_090120	GW	9		9						9	MS/MSD
17121.04	9/1/20	10:55	MW-16-84_090120	GW	3		3						3	
.05	9/1/20	12:05	MW-20-129_090120	GW	3		3						3	
.06	9/1/20	13:30	MW-19-115_090120	GW	3		3						3	
.07	9/1/20	15:05	MW-15-72_090120	GW	3		3						3	
.08	9/2/20	9:45	MW-19-117_090220	GW	3		3						3	
.09	9/2/20	10:55	MW-19-116_090220	GW	3		3						3	
.10	9/2/20	12:20	PW-14-02_090220	GW	3		3						3	
.11	9/2/20	13:45	MW-20-126_090220	GW	3		3						3	
.12	9/2/20	—	Dup-01_090220	GW	3		3						3	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis (Sampler)	DATE 9.2.20	TIME 14:10
RECEIVED BY: SIGNATURE/ORGANIZATION	Arcadis	DATE 9/2/20	TIME 1410
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 9/2/20	TIME 1430
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 9/2/20	TIME 1430

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis	DATE 9/2/20	TIME 1430
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Sample Drop Box	DATE 9/2/20	TIME 1430

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Merit Laboratories, Inc.
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C.O.C. PAGE # 2 OF 2

127306

CHAIN OF CUSTODY RECORD Plant 2

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO: 248-994-2240 FAX NO: 248-994-2241 P.O. NO.: 30042872.04706
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04706 / RACER Lansing Plant 2
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / Aus Lwst
TURNAROUND TIME REQUIRED: ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☒ Other MI
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane (8260B SIM)
127121.13	9/1/20	0955	MW-19-123_090120	GW	3		3						X
.14	9/1/20	1125	TW-14-02_090120	GW	3		3						X
.15	9/1/20	1310	MW-16-74_090120	GW	3		3						X
.16	9/1/20	1435	MW-20-128_090120	GW	3		3						X
.17	9/2/20	0900	MW-19-122_090220	GW	3		3						X
.18	9/2/20	1025	MW-16-81_090220	GW	3		3						X
.19	9/2/20	——	Dup-02_090220	GW	3		3						X
.20	9/2/20	1135	MW-19-124_090220	GW	3		3						X
.21	9/2/20	1255	MW-19-120_090220	GW	3		3						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Aus Lwst / Arcadis	☒ Sampler	DATE 9/2/20	TIME 1430
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Sample Drop Box		DATE 9/2/20	TIME 1430
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Dropbox		DATE 9/2/20	TIME 1430
RECEIVED BY: SIGNATURE/ORGANIZATION	Sam Smith		DATE 9/2/20	TIME 1430

RELINQUISHED BY: SIGNATURE/ORGANIZATION — DATE — TIME
RECEIVED BY: SIGNATURE/ORGANIZATION — DATE — TIME

SEAL NO. — SEAL INTACT YES ☐ NO ☐ — INITIALS
SEAL NO. — SEAL INTACT YES ☐ NO ☐ — INITIALS

NOTES: TEMP ON ARRIVAL 22

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Analytical Laboratory Report

Report ID: S15985.01(01)
Generated on 08/06/2020

Report to

Attention: Marina Samp
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-994-2318 C:616-638-6394 FAX:
Email: Marina.Samp@arcadis.com

Addtional Contacts: Alex Villhauer, Tiffany Linder, Trevor Swarthout

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S15985.01-S15985.04
Project: 30042872.04600 / RACER Lansing
Collected Date(s): 07/23/2020
Submitted Date/Time: 07/23/2020 18:40
Sampled by: A. Mandich
P.O. #: 30042872.04600

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1
N/A	Not Applicable
SM4500-N(org)/NH	Standard Method 4500 N(org)B / NH3D 2011
SM4500-PE	Standard Method 4500 P E 2011
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S15985.01	MW-20-126_072320	Groundwater	07/23/20 10:20
S15985.02	MW-20-127_072320	Groundwater	07/23/20 12:25
S15985.03	MW-20-128_072320	Groundwater	07/23/20 14:45
S15985.04	MW-20-129_072320	Groundwater	07/23/20 16:15

Analytical Laboratory Report

Lab Sample ID: S15985.01
Sample Tag: MW-20-126_072320
Collected Date/Time: 07/23/2020 10:20
Matrix: Groundwater
COC Reference: 134311

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	8.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	08/06/20 14:50	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 08/06/20 13:46, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	370	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S15985.02
Sample Tag: MW-20-127_072320
Collected Date/Time: 07/23/2020 12:25
Matrix: Groundwater
COC Reference: 134311

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	8.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	08/06/20 14:50	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 08/06/20 14:13, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	85	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S15985.03
Sample Tag: MW-20-128_072320
Collected Date/Time: 07/23/2020 14:45
Matrix: Groundwater
COC Reference: 134311

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	8.0	IR
1	250ml Plastic	H2SO4	Yes	8.0	IR
1	125ml Plastic	None	Yes	8.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	08/06/20 14:50	JML	

Inorganics

Method: E300.0, Run Date: 07/24/20 11:21, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 07/29/20 15:45, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.6	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 07/29/20 18:10, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.09	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 08/06/20 14:57, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	270	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S15985.04
Sample Tag: MW-20-129_072320
Collected Date/Time: 07/23/2020 16:15
Matrix: Groundwater
COC Reference: 134311

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	8.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	08/06/20 14:50	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 08/06/20 14:35, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	126	1		ug/L	1	123-91-1	

Merit Laboratories Login Checklist

Lab Set ID: S15985
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04600 / RACER Lansing
Submitted: 07/23/2020 18:40 Login User: REJ

Attention: Marina Samp
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-994-2318 FAX:
Email: Marina.Samp@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	☐ Yes	☒ No	☐ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 8.0
02.	☒ Yes	☐ No	☐ N/A	Received on ice/ cooling process begun	
03.	☐ Yes	☒ No	☐ N/A	Samples shipped	
04.	☒ Yes	☐ No	☐ N/A	Samples left in 24 hr. drop box	
05.	☐ Yes	☐ No	☒ N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	☒ Yes	☐ No	☐ N/A	COC adequately filled out	
07.	☒ Yes	☐ No	☐ N/A	COC signed and relinquished to the lab	
08.	☒ Yes	☐ No	☐ N/A	Sample tag on bottles match COC	
09.	☐ Yes	☒ No	☐ N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	☒ Yes	☐ No	☐ N/A	Do sample have correct chemical preservation	
11.	☒ Yes	☐ No	☐ N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	☐ Yes	☒ No	☐ N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	☒ Yes	☐ No	☐ N/A	All bottles intact	
14.	☒ Yes	☐ No	☐ N/A	Appropriate analytical bottles are used	
15.	☒ Yes	☐ No	☐ N/A	Merit bottles used	
16.	☒ Yes	☐ No	☐ N/A	Sufficient sample volume received	
17.	☐ Yes	☒ No	☐ N/A	Samples require laboratory filtration	
18.	☒ Yes	☐ No	☐ N/A	Samples submitted within holding time	
19.	☐ Yes	☒ No	☐ N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S15985 Submitted: 07/23/2020 18:40

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30042872.04600 / RACER Lansing

Initial Preservation Check: 07/23/2020 20:48 REJ

Preservation Recheck (E200.8): N/A

Attention: Marina Samp
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-994-2318 FAX:
Email: Marina.Samp@arcadis.com

Lab ID	125 ml Plastic HNO_3	250 ml Plastic HNO_3	1 L Plastic HNO_3	250 ml Plastic H_2SO_4	125 ml Amber H_2SO_4	32 oz Glass HCl	125 ml Plastic NaOH	125 ml Amber $PbCO_3$ NaOH	pH					Notes
									<2	>12	other	ml add	new pH	
S15985.03				X					X					

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

134311

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Marina Samp / Eric Feenstra
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Suite 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 248-994-2318 | FAX NO.: | P.O. NO.:
E-MAIL ADDRESS: marina.samp@arcadis.com + Eric → | QUOTE NO.:

INVOICE TO

CONTACT NAME: | ☑ SAME
COMPANY:
ADDRESS:
CITY: | STATE: | ZIP CODE:
PHONE NO.: | E-MAIL ADDRESS: Eric.feenstra@arcadis.com

PROJECT NO./NAME: 30042872.04600 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: A. Mandich / Amyssa Mandich

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	8260B-SIMS 1,2-DCA	E300 Nitrate	4500-Norg/NH3 TKN	SM 4500-PE Total P								
19185.01	7/23/20	1020	MW-20-126_072320	GW	3		X						3											
.02	7/23/20	1225	MW-20-127_072320	GW	3		X						3											
.03	7/23/20	1445	MW-20-128_072320	GW	5		3		1				3	1	1	1								
.04	7/23/20	1615	MW-20-129_072320	GW	3		X						3											

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Amyssa Mandich/Arcadis ☒ Sampler — DATE: 7/23/20 — TIME: 1840
RECEIVED BY: SIGNATURE/ORGANIZATION: [signature] — DATE: 7/23/20 — TIME: 1840
RELINQUISHED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: — DATE: — TIME:

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: | TEMP. ON ARRIVAL: 8.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Analytical Laboratory Report

Report ID: S16987.01(01)
Generated on 09/10/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S16987.01-S16987.05
Project: RACER Lansing Plant-3
Collected Date(s): 08/27/2020
Submitted Date/Time: 08/27/2020 15:35
Sampled by: Billy Cobern
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

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

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Analytical Laboratory Report

Sample Summary (5 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S16987.01	PW-14-03_082720	Groundwater	08/27/20 10:15
S16987.02	TW-15-11_082720	Groundwater	08/27/20 11:30
S16987.03	MW-13-22_082720	Groundwater	08/27/20 12:55
S16987.04	MW-13-34_082720	Groundwater	08/27/20 14:30
S16987.05	Trip Blank_082720	Water	08/27/20 00:01

Analytical Laboratory Report

Lab Sample ID: S16987.01
Sample Tag: PW-14-03_082720
Collected Date/Time: 08/27/2020 10:15
Matrix: Groundwater
COC Reference: 127302

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/03/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/02/20 16:59, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	69	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S16987.02
Sample Tag: TW-15-11_082720
Collected Date/Time: 08/27/2020 11:30
Matrix: Groundwater
COC Reference: 127302

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/03/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/02/20 18:05, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	120	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S16987.03
Sample Tag: MW-13-22_082720
Collected Date/Time: 08/27/2020 12:55
Matrix: Groundwater
COC Reference: 127302

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/03/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/02/20 19:34, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	141	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S16987.04
Sample Tag: MW-13-34_082720
Collected Date/Time: 08/27/2020 14:30
Matrix: Groundwater
COC Reference: 127302

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/03/20 13:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/02/20 19:12, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	75	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S16987.05
Sample Tag: Trip Blank_082720
Collected Date/Time: 08/27/2020 00:01
Matrix: Water
COC Reference: 127302

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	4.2	IR

Other / Misc.

Method: , Run Date: 08/28/20 14:20, Analyst: MMC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Merit Laboratories Login Checklist

Lab Set ID: S16987
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing Plant-3
Submitted: 08/27/2020 15:35 Login User: MMC

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

	Selection			Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

127302

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: TIFFANY LINDEN
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR. SUITE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2240 FAX NO.: 248-994-2241 P.O. NO.: 30042872
E-MAIL ADDRESS: TIFFANY.LINDEN@ARCADIS QUOTE NO.:

INVOICE TO

CONTACT NAME ☐ SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. E-MAIL ADDRESS

PROJECT NO./NAME: RACER LANSING PLANT-3
SAMPLER(S) - PLEASE PRINT/SIGN NAME: BRIAN CASE

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane
16987.01	8/27/20	10:15	PW-14-03_082720	GW	3		3						X
.02	8/27/20	11:30	TW-15-11_082720	GW	3		3						X
.03	8/27/20	12:55	MW-13-22_082720	GW	3		3						X
.04	8/27/20	14:30	MW-13-34_082720	GW	3		3						X
.05	—	—	TRIP BLANK_082720	DW	1		1						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	ARCADIS ☒ Sampler	DATE 8.27.20	TIME 15:35	
RECEIVED BY: SIGNATURE/ORGANIZATION	M Ashcraft	DATE 8/27/2020	TIME 1535	
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME	
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME	

RELINQUISHED BY: SIGNATURE/ORGANIZATION			DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE	TIME
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES:	TEMP. ON ARRIVAL 4.2
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS		

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S17055.01(01)
Generated on 09/08/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S17055.01-S17055.04
Project: 30042872 / RACER Lansing Plant 6
Collected Date(s): 08/31/2020
Submitted Date/Time: 08/31/2020 18:45
Sampled by: Austin Westhuis
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

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

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S17055.01	MW-13-36R_083120	Groundwater	08/31/20 14:20
S17055.02	Dup-02_083120	Groundwater	08/31/20 00:01
S17055.03	MW-13-35_083120	Groundwater	08/31/20 16:50
S17055.04	Trip Blank	Groundwater	08/31/20 00:01

Lab Sample ID: S17055.01
Sample Tag: MW-13-36R_083120
Collected Date/Time: 08/31/2020 14:20
Matrix: Groundwater
COC Reference: 127303

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Amber	None	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
BNA Extraction	Completed	SW3510C	09/04/20 10:00	JL	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 09/04/20 19:56, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	

Lab Sample ID: S17055.01 (continued)
Sample Tag: MW-13-36R_083120

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 09/04/20 19:56, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Lab Sample ID: S17055.02
Sample Tag: Dup-02_083120
Collected Date/Time: 08/31/2020 00:01
Matrix: Groundwater
COC Reference: 127303

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Amber	None	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
BNA Extraction	Completed	SW3510C	09/04/20 10:00	JL	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 09/04/20 20:27, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	

Lab Sample ID: S17055.02 (continued)
Sample Tag: Dup-02_083120

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 09/04/20 20:27, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Lab Sample ID: S17055.03
Sample Tag: MW-13-35_083120
Collected Date/Time: 08/31/2020 16:50
Matrix: Groundwater
COC Reference: 127303

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Amber	None	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
BNA Extraction	Completed	SW3510C	09/04/20 10:00	JL	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 09/04/20 20:57, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	2	83-32-9	
Acenaphthylene	Not detected	5		ug/L	2	208-96-8	
Anthracene	Not detected	5		ug/L	2	120-12-7	
Benzo(a)anthracene	Not detected	1		ug/L	2	56-55-3	
Benzo(b)fluoranthene	Not detected	1		ug/L	2	205-99-2	
Benzo(k)fluoranthene	Not detected	1		ug/L	2	207-08-9	
Benzo(ghi)perylene	Not detected	1		ug/L	2	191-24-2	
Benzo(a)pyrene	Not detected	1		ug/L	2	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	2	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	2	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	2	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	2	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	2	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	2	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	2	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	2	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	2	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	2	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	2	7005-72-3	
Chrysene	Not detected	1		ug/L	2	218-01-9	
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	2	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	2	95-48-7	
Dibenzo(ah)anthracene	Not detected	2		ug/L	2	53-70-3	
Dibenzofuran	Not detected	4		ug/L	2	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	2	84-74-2	
1,2-Dichlorobenzene	Not detected	1		ug/L	2	95-50-1	
1,3-Dichlorobenzene	Not detected	1		ug/L	2	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	2	106-46-7	
3,3'-Dichlorobenzidine	Not detected	5		ug/L	2	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	2	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	2	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	2	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	2	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	2	534-52-1	
2,4-Dinitrophenol	Not detected	25		ug/L	2	51-28-5	
2,4-Dinitrotoluene	Not detected	5		ug/L	2	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	2	606-20-2	

Lab Sample ID: S17055.03 (continued)
Sample Tag: MW-13-35_083120

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 09/04/20 20:57, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Diphenylhydrazine*	Not detected	5		ug/L	2	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	2	117-84-0	
Fluoranthene	Not detected	1		ug/L	2	206-44-0	
Fluorene	Not detected	5		ug/L	2	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	2	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	2	87-68-3	
Hexachlorocyclopentadiene	Not detected	5		ug/L	2	77-47-4	
Hexachloroethane	Not detected	5		ug/L	2	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	2		ug/L	2	193-39-5	
Isophorone	Not detected	5		ug/L	2	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	2	91-57-6	
Naphthalene	Not detected	5		ug/L	2	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	2	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	2	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	2	100-01-6	
Nitrobenzene	Not detected	5		ug/L	2	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	2	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	2	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	2	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	2	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	2	87-86-5	
Phenanthrene	Not detected	2		ug/L	2	85-01-8	
Phenol	Not detected	5		ug/L	2	108-95-2	
Pyrene	Not detected	5		ug/L	2	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	2	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	2	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	2	88-06-2	

Analytical Laboratory Report

Lab Sample ID: S17055.04
Sample Tag: Trip Blank
Collected Date/Time: 08/31/2020 00:01
Matrix: Groundwater
COC Reference: 127303

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	4.1	IR

Other / Misc.

Method: , Run Date: 09/02/20 15:40, Analyst: MMC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Merit Laboratories Login Checklist

Lab Set ID: S17055
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / RACER Lansing Plant 6
Submitted: 08/31/2020 18:45 Login User: REJ

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.1
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[ ] Yes	[X] No	[ ] N/A	Appropriate analytical bottles are used	HCl VOA provided for Trip Blank but SVOC requested
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

127303

CHAIN OF CUSTODY RECORD Plant 6

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 810-225-1928 FAX NO.: 248-994-2241 P.O. NO.: 30042872
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: [X] SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / RACER Lansing Plant 6
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS [X] STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	SVOCs
170550 1	8/31/20	1420	MW-13-36R_083120	GW	2	2							X
.02	8/31/20	—	Dup-02_083120	GW	2	2							X
.03	8/31/20	1650	MW-13-35_083120	GW	2	2							X
.04	8/31/20	—	Trip Blank	GW	1		1						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	[signature] / Arcadis [X] Sampler	8/31/20	1815
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Sample Drop Box	8/31/20	1815
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	8/31/20	1845
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	8/31/20	1845

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S17056.01(01)
Generated on 09/14/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S17056.01-S17056.02
Project: RACER Lansing (Plant 3)
Collected Date(s): 08/31/2020
Submitted Date/Time: 08/31/2020 18:45
Sampled by: Billy Cobern
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

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

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1
N/A	Not Applicable
SM4500-N(org)/NH	Standard Method 4500 N(org)B / NH3D 2011
SM4500-PE	Standard Method 4500 P E 2011
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S17056.01	TW-14-06_083120	Groundwater	08/31/20 10:05
S17056.02	Dup-03_083120	Groundwater	08/31/20 00:01

Analytical Laboratory Report

Lab Sample ID: S17056.01
Sample Tag: TW-14-06_083120
Collected Date/Time: 08/31/2020 10:05
Matrix: Groundwater
COC Reference: 127304

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR
1	250ml Plastic	H2SO4	Yes	4.1	IR
1	125ml Plastic	None	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/03/20 13:00	JML	

Inorganics

Method: E300.0, Run Date: 09/01/20 09:05, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 09/01/20 18:45, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	2.4	0.2		mg/L	1		

Method: SM4500-PE, Run Date: 09/02/20 18:02, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	1.6	0.3	0.2	mg/L	25	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 14:39, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	4	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S17056.02
Sample Tag: Dup-03_083120
Collected Date/Time: 08/31/2020 00:01
Matrix: Groundwater
COC Reference: 127304

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR
1	250ml Plastic	H2SO4	Yes	4.1	IR
1	125ml Plastic	None	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/03/20 13:00	JML	

Inorganics

Method: E300.0, Run Date: 09/01/20 09:18, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 09/01/20 19:13, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	2.2	0.2		mg/L	1		

Method: SM4500-PE, Run Date: 09/02/20 18:09, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	1.1	0.3	0.2	mg/L	25	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 15:02, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	4	1		ug/L	1	123-91-1	

Merit Laboratories Login Checklist

Lab Set ID: S17056
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing (Plant 3)
Submitted: 08/31/2020 18:45 Login User: REJ

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.1
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S17056 Submitted: 08/31/2020 18:45

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: RACER Lansing (Plant 3)

Initial Preservation Check: 08/31/2020 19:08 REJ

Preservation Recheck (E200.8): N/A

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S17056.01	250ml Plastic H2SO4	<2			
S17056.02	250ml Plastic H2SO4	<2			

Merit Laboratories, Inc.
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Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

127304

CHAIN OF CUSTODY RECORD Plant 3

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Ste 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2240 FAX NO.: 248-994-2241 P.O. NO.: 30042872
E-MAIL ADDRESS: Tiffany.Linder@Arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: Racer Lansing (Plant-3)
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Billy J. Green

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane	TKN, Total Phosphorus	Nitrate
1705601	8/31/20	10:05	TW-14-06_083120	GW	5	1	3		1				3	1	1
.02	8/31/20	—	DUP-03_083120	GW	5	1	3		1				3	1	1

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis ☒ Sampler DATE: 8-31-20 TIME: 1740
RECEIVED BY: SIGNATURE/ORGANIZATION: Arcadis DATE: 8/31/20 TIME: 1740
RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit DMP BOX DATE: 8/31/20 TIME: 1845
RECEIVED BY: DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis DATE: 8/31/20 TIME: 1815
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Sample Drop Box DATE: 8/31/20 TIME: 1815

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT INITIALS

NOTES: TEMP. ON ARRIVAL: 4.1

Analytical Laboratory Report

Report ID: S17057.01(01)
Generated on 09/14/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S17057.01-S17057.04
Project: RACER Lansing (Plant-2)
Collected Date(s): 08/31/2020
Submitted Date/Time: 08/31/2020 18:45
Sampled by: Billy Cobern
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

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

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1
N/A	Not Applicable
SM4500-N(org)/NH	Standard Method 4500 N(org)B / NH3D 2011
SM4500-PE	Standard Method 4500 P E 2011
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S17057.01	MW-19-121_083120	Groundwater	08/31/20 11:45
S17057.02	MW-14-61_083120	Groundwater	08/31/20 13:00
S17057.03	MW-20-127_083120	Groundwater	08/31/20 14:15
S17057.04	TW-15-12_083120	Groundwater	08/31/20 15:45

Analytical Laboratory Report

Lab Sample ID: S17057.01
Sample Tag: MW-19-121_083120
Collected Date/Time: 08/31/2020 11:45
Matrix: Groundwater
COC Reference: 127305

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR
1	250ml Plastic	H2SO4	Yes	4.1	IR
1	125ml Plastic	None	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/03/20 13:00	JML	

Inorganics

Method: E300.0, Run Date: 09/01/20 09:31, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 09/01/20 19:33, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.9	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 09/02/20 18:13, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.06	0.05	0.045	mg/L	5	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 15:24, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	17	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S17057.02
Sample Tag: MW-14-61_083120
Collected Date/Time: 08/31/2020 13:00
Matrix: Groundwater
COC Reference: 127305

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR
1	250ml Plastic	H2SO4	Yes	4.1	IR
1	125ml Plastic	None	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/03/20 13:00	JML	

Inorganics

Method: E300.0, Run Date: 09/01/20 09:44, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 09/01/20 22:22, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.5	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 09/02/20 18:19, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.03	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/02/20 20:18, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	98	1		ug/L	1	123-91-1	

Lab Sample ID: S17057.03
Sample Tag: MW-20-127_083120
Collected Date/Time: 08/31/2020 14:15
Matrix: Groundwater
COC Reference: 127305

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR
1	250ml Plastic	H2SO4	Yes	4.1	IR
1	125ml Plastic	None	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/03/20 13:00	JML	

Inorganics

Method: E300.0, Run Date: 09/01/20 09:56, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 09/01/20 22:42, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.8	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 09/02/20 18:24, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.04	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/02/20 18:49, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	115	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S17057.04
Sample Tag: TW-15-12_083120
Collected Date/Time: 08/31/2020 15:45
Matrix: Groundwater
COC Reference: 127305

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR
1	250ml Plastic	H2SO4	Yes	4.1	IR
1	125ml Plastic	None	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/03/20 13:00	JML	

Inorganics

Method: E300.0, Run Date: 09/01/20 10:09, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 09/01/20 23:04, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	1.0	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 09/02/20 18:29, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.45	0.05	0.045	mg/L	5	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/02/20 18:27, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	100	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Merit Laboratories Login Checklist

Lab Set ID: S17057
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing (Plant-2)
Submitted: 08/31/2020 18:45 Login User: REJ

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.1
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S17057 Submitted: 08/31/2020 18:45

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: RACER Lansing (Plant-2)

Initial Preservation Check: 08/31/2020 19:11 REJ

Preservation Recheck (E200.8): N/A

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S17057.01	250ml Plastic H2SO4	<2			
S17057.02	250ml Plastic H2SO4	<2			
S17057.03	250ml Plastic H2SO4	<2			
S17057.04	250ml Plastic H2SO4	<2			

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

127305

CHAIN OF CUSTODY RECORD Plant 2

REPORT TO

CONTACT NAME: TIFFANY LINDER
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR SUITE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2240 FAX NO.: 248-994-2241 P.O. NO.: 30042872
E-MAIL ADDRESS: TIFFANY.LINDER@ARCADIS.COM QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: ROGEN LANSING (PLANT-2)
SAMPLER(S) - PLEASE PRINT/SIGN NAME: BILLY J. CAGER

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 DIOXANE	NITRATE	TKN/TOTAL PHOSPHORUS
170570 1	8/31/20	11:45	MW-19-121_083120	GW	5	1	3		1				3	1	1
02	8/31/20	13:00	MW-14-61_083120	GW	5	1	3		1				3	1	1
03	8/31/20	14:15	MW-20-127_083120	GW	5	1	3		1				3	1	1
04	8/31/20	15:45	TW-15-12_083120	GW	5	1	3		1				3	1	1

RELINQUISHED BY: SIGNATURE/ORGANIZATION	ARCADIS	☒ Sampler	DATE 8.31.20	TIME 1740
RECEIVED BY: SIGNATURE/ORGANIZATION	Arcadis		DATE 8/31/20	TIME 1740
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box		DATE 8/31/20	TIME 1845
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE 8/31/20	TIME 1845

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis		DATE 8/31/20	TIME 1815
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Sample Drop Box		DATE 8/31/20	TIME 1815

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S17121.01(01)
Generated on 09/17/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S17121.01-S17121.21
Project: 30042872.04700 / RACER Lansing Plant 2
Collected Date(s): 09/01/2020 - 09/02/2020
Submitted Date/Time: 09/02/2020 14:30
Sampled by: Billy Cobern / Austin Westhuis
P.O. #: 30042872.04700

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Technical Director

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Report Narrative

There is no additional narrative for this analytical report

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WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

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x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
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MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (21 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S17121.01	MW-17-86_090120	Groundwater	09/01/20 09:35
S17121.02	MW-17-86_090120 MS	Groundwater	09/01/20 09:35
S17121.03	MW-17-86_090120 MSD	Groundwater	09/01/20 09:35
S17121.04	MW-16-84_090120	Groundwater	09/01/20 10:55
S17121.05	MW-20-129_090120	Groundwater	09/01/20 12:05
S17121.06	MW-19-115_090120	Groundwater	09/01/20 13:30
S17121.07	MW-15-72_090120	Groundwater	09/01/20 15:05
S17121.08	MW-19-117_090220	Groundwater	09/02/20 09:45
S17121.09	MW-19-116_090220	Groundwater	09/02/20 10:55
S17121.10	PW-14-02_090220	Groundwater	09/02/20 12:20
S17121.11	MW-20-126_090220	Groundwater	09/02/20 13:45
S17121.12	Dup-01_090220	Groundwater	09/02/20 00:01
S17121.13	MW-19-123_090120	Groundwater	09/01/20 09:55
S17121.14	TW-14-02_090120	Groundwater	09/01/20 11:25
S17121.15	MW-16-74_090120	Groundwater	09/01/20 13:10
S17121.16	MW-20-128_090120	Groundwater	09/01/20 14:35
S17121.17	MW-19-122_090220	Groundwater	09/02/20 09:00
S17121.18	MW-16-81_090220	Groundwater	09/02/20 10:25
S17121.19	Dup-02_090220	Groundwater	09/02/20 00:01
S17121.20	MW-19-124_090220	Groundwater	09/02/20 11:35
S17121.21	MW-19-120_090220	Groundwater	09/02/20 12:55

Analytical Laboratory Report

Lab Sample ID: S17121.01
Sample Tag: MW-17-86_090120
Collected Date/Time: 09/01/2020 09:35
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 16:08, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	88	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.02
Sample Tag: MW-17-86_090120 MS
Collected Date/Time: 09/01/2020 09:35
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 13:14, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	129	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S17121.03
Sample Tag: MW-17-86_090120 MSD
Collected Date/Time: 09/01/2020 09:35
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 13:35, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	129	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S17121.04
Sample Tag: MW-16-84_090120
Collected Date/Time: 09/01/2020 10:55
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 16:30, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	57	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.05
Sample Tag: MW-20-129_090120
Collected Date/Time: 09/01/2020 12:05
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 16:53, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	126	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.06
Sample Tag: MW-19-115_090120
Collected Date/Time: 09/01/2020 13:30
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 17:15, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	8	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.07
Sample Tag: MW-15-72_090120
Collected Date/Time: 09/01/2020 15:05
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 21:19, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	90	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S17121.08
Sample Tag: MW-19-117_090220
Collected Date/Time: 09/02/2020 09:45
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 17:37, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.09
Sample Tag: MW-19-116_090220
Collected Date/Time: 09/02/2020 10:55
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 17:59, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	54	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.10
Sample Tag: PW-14-02_090220
Collected Date/Time: 09/02/2020 12:20
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 18:21, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	43	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.11
Sample Tag: MW-20-126_090220
Collected Date/Time: 09/02/2020 13:45
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/15/20 15:22, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	360	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S17121.12
Sample Tag: Dup-01_090220
Collected Date/Time: 09/02/2020 00:01
Matrix: Groundwater
COC Reference: 127307

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/15/20 15:00, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	55	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.13
Sample Tag: MW-19-123_090120
Collected Date/Time: 09/01/2020 09:55
Matrix: Groundwater
COC Reference: 127306

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 19:05, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	51	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.14
Sample Tag: TW-14-02_090120
Collected Date/Time: 09/01/2020 11:25
Matrix: Groundwater
COC Reference: 127306

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/15/20 13:31, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.15
Sample Tag: MW-16-74_090120
Collected Date/Time: 09/01/2020 13:10
Matrix: Groundwater
COC Reference: 127306

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/15/20 13:53, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	3	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.16
Sample Tag: MW-20-128_090120
Collected Date/Time: 09/01/2020 14:35
Matrix: Groundwater
COC Reference: 127306

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 19:50, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	112	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.17
Sample Tag: MW-19-122_090220
Collected Date/Time: 09/02/2020 09:00
Matrix: Groundwater
COC Reference: 127306

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 20:12, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	33	1		ug/L	1	123-91-1	

Lab Sample ID: S17121.18
Sample Tag: MW-16-81_090220
Collected Date/Time: 09/02/2020 10:25
Matrix: Groundwater
COC Reference: 127306

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/15/20 15:45, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	500	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S17121.19
Sample Tag: Dup-02_090220
Collected Date/Time: 09/02/2020 00:01
Matrix: Groundwater
COC Reference: 127306

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/15/20 16:07, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	590	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S17121.20
Sample Tag: MW-19-124_090220
Collected Date/Time: 09/02/2020 11:35
Matrix: Groundwater
COC Reference: 127306

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/15/20 16:29, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	230	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S17121.21
Sample Tag: MW-19-120_090220
Collected Date/Time: 09/02/2020 12:55
Matrix: Groundwater
COC Reference: 127306

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	09/14/20 12:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 09/11/20 20:56, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	137	1		ug/L	1	123-91-1	

Merit Laboratories Login Checklist

Lab Set ID:S17121
Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / RACER Lansing Plant 2
Submitted:09/02/2020 14:30 Login User: SRS

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

127307

CHAIN OF CUSTODY RECORD Plant 2

REPORT TO

CONTACT NAME: TIFFANY LINDEN
COMPANY: ARCADIS
ADDRESS: 28550 CABOT DR. STE 500
CITY: NOVI STATE: MI ZIP CODE: 48377
PHONE NO: 248-994-2240 FAX NO: 248-994-2241 PO NO: 30042872
E-MAIL ADDRESS: TIFFANY.LINDEN@ARCADIS.COM QUOTE NO.

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER LANSING
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Billy J. Cosgal

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

1,4-Dioxane 8260 SIM

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260 SIM	Special Instructions
01/02/.03	9/1/20	9:35	MW-17-86_090120	GW	9		9						9	MS/MSD
17121.04	9/1/20	10:55	MW-16-84_090120	GW	3		3						3	
.05	9/1/20	12:05	MW-20-129_090120	GW	3		3						3	
.06	9/1/20	13:30	MW-19-115_090120	GW	3		3						3	
.07	9/1/20	15:05	MW-15-72_090120	GW	3		3						3	
.08	9/2/20	9:45	MW-19-117_090220	GW	3		3						3	
.09	9/2/20	10:55	MW-19-116_090220	GW	3		3						3	
.10	9/2/20	12:20	PW-14-02_090220	GW	3		3						3	
.11	9/2/20	13:45	MW-20-126_090220	GW	3		3						3	
.12	9/2/20	—	Dup-01_090220	GW	3		3						3	

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis (Sampler)	DATE 9.2.20	TIME 14:10
RECEIVED BY: SIGNATURE/ORGANIZATION	Arcadis	DATE 9/2/20	TIME 1410
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 9/2/20	TIME 1430
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 9/2/20	TIME 1430

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis	DATE 9/2/20	TIME 1430
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Sample Drop Box	DATE 9/2/20	TIME 1430

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Merit Laboratories, Inc.
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C.O.C. PAGE # 2 OF 2

127306

CHAIN OF CUSTODY RECORD Plant 2

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO: 248-994-2240 FAX NO: 248-994-2241 P.O. NO.: 30042872.04706
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04706 / RACER Lansing Plant 2
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / Aus Lwst
TURNAROUND TIME REQUIRED: ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☒ Other MI
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane (8260B SIM)
127121.13	9/1/20	0955	MW-19-123_090120	GW	3		3						X
.14	9/1/20	1125	TW-14-02_090120	GW	3		3						X
.15	9/1/20	1310	MW-16-74_090120	GW	3		3						X
.16	9/1/20	1435	MW-20-128_090120	GW	3		3						X
.17	9/2/20	0900	MW-19-122_090220	GW	3		3						X
.18	9/2/20	1025	MW-16-81_090220	GW	3		3						X
.19	9/2/20	——	Dup-02_090220	GW	3		3						X
.20	9/2/20	1135	MW-19-124_090220	GW	3		3						X
.21	9/2/20	1255	MW-19-120_090220	GW	3		3						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Aus Lwst / Arcadis	☒ Sampler	DATE 9/2/20	TIME 1430
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Sample Drop Box		DATE 9/2/20	TIME 1430
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Dropbox		DATE 9/2/20	TIME 1430
RECEIVED BY: SIGNATURE/ORGANIZATION	Sam Smith		DATE 9/2/20	TIME 1430

RELINQUISHED BY: SIGNATURE/ORGANIZATION — DATE — TIME
RECEIVED BY: SIGNATURE/ORGANIZATION — DATE — TIME

SEAL NO. — SEAL INTACT YES ☐ NO ☐ — INITIALS
SEAL NO. — SEAL INTACT YES ☐ NO ☐ — INITIALS

NOTES: TEMP ON ARRIVAL 22

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Quality Control Report

Report ID: QC-S15676-01
Generated on 07/20/2020

Report to

Attention: Andrew Lorenz
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S15676.01
Project: 30042872.04600 / RACER Lansing
Submitted Date/Time: 07/15/2020 12:11
Sampled by: Austin Westhuis
P.O. #: 30042872.04600

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Page 2)
Prep Batch Summary (Page 3)
Surrogates per Lab Sample (Page 4)
Surrogates per QC Sample (Page 5)
Batch QC Results (Page 6)

Report Flag Descriptions

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

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

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S15676.01

Sample Tag: VAP-P2-LW84(70-74)(071520)

Collected Date/Time: 07/15/2020 11:30

Matrix: Groundwater

COC Reference: 113933

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	07/16/20 12:27	200715A9	VS200716W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS200716W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15676.01	1,4-Dioxane	SW8260B - SIM	07/16/20 12:27	200715A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S15676.01

Sample Tag: VAP-P2-LW84(70-74)(071520)

Collected Date/Time: 07/15/2020 11:30

Matrix: Groundwater

COC Reference: 113933

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200715A9, Run Date: 07/16/2020 12:27, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200716W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200715A9.BLKW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:21, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 10:18, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200715A9.LCSDW15A, Parent Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:00, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**90.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200716W1

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

Blank (BLK)

Lab Sample ID: 200715A9.BLKW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:21, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 10:18, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		82.3	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200715A9.LCSDW15A, Parent Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:00, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		108.1	70.0	130.0	27.1	30.0

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C.O.C. PAGE # 1 OF 1

113933

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Andrew Lorenz
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-809-1813 FAX NO.: 248-994-2241 P.O. NO.: 30042872.04600
E-MAIL ADDRESS: Andrew.Lorenz@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04600 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☒ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260 SIMS	Special Instructions
15676.01	7/15/20	1130	VAP-P2-LW84(70-74)(071520)	GW	3		3						X	★ 24-hour rush TAT ★

RELINQUISHED BY: SIGNATURE/ORGANIZATION [signature] / Arcadis ☒ Sampler DATE 7/15/20 TIME 1211
RECEIVED BY: SIGNATURE/ORGANIZATION Merit Lab Drop Box DATE 7/15/20 TIME 1211

RELINQUISHED BY: SIGNATURE/ORGANIZATION Merit Drop Box DATE 7/15/2020 TIME 1211
RECEIVED BY: SIGNATURE/ORGANIZATION [signature] DATE 7/15/2020 TIME 1211

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES TEMP. ON ARRIVAL 3.3

★ Please notify us if you will not be able to meet this turnaround time. PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Quality Control Report

Report ID: QC-S15710-01
Generated on 07/20/2020

Report to

Attention: Andrew Lorenz
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S15710.01
Project: 30042872.04600 / RACER Lansing
Submitted Date/Time: 07/15/2020 18:10
Sampled by: Austin Westhuis
P.O. #: 30042872.04600

QC Report Sections

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Prep Batch Summary (Page 3)
Surrogates per Lab Sample (Page 4)
Surrogates per QC Sample (Page 5)
Batch QC Results (Page 6)

Report Flag Descriptions

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

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S15710.01

Sample Tag: VAP-P2-MM85(73-77)(071520)

Collected Date/Time: 07/15/2020 17:40

Matrix: Groundwater

COC Reference: 124312

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	07/16/20 12:50	200715A9	VS200716W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS200716W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15710.01	1,4-Dioxane	SW8260B - SIM	07/16/20 12:50	200715A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S15710.01

Sample Tag: VAP-P2-MM85(73-77)(071520)

Collected Date/Time: 07/15/2020 17:40

Matrix: Groundwater

COC Reference: 124312

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200715A9, Run Date: 07/16/2020 12:50, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200716W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200715A9.BLKW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:21, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 10:18, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200715A9.LCSDW15A, Parent Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:00, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**90.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200716W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200715A9.BLKW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:21, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 10:18, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		82.3	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200715A9.LCSDW15A, Parent Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:00, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		108.1	70.0	130.0	27.1	30.0

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C.O.C. PAGE # 1 OF 1

124312

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Andrew Lorenz
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-809-1813 FAX NO.: 248-994-2241 P.O. NO.: 30042872.04600
E-MAIL ADDRESS: Andrew.Lorenz@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04600 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED: ☒ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO3	H2SO4	NaOH	MeOH	OTHER	1,4-Dioxane 8260 SIMS	Special Instructions
15710.01	7/15/20	1740	VAP-P2-MW85(73-77)(071520)	GW	3		3						X	★24-hour rush TAT★

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☒ Other MI

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] / Arcadis ☒ Sampler DATE: 7/15/20 TIME: 1810
RECEIVED BY: SIGNATURE/ORGANIZATION: [signature] DATE: 7/15/20 TIME: 1810
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL: 4.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Please also email results to: Eric.Feenstra@arcadis.com and Austin.Westhuis@arcadis.com

Quality Control Report

Report ID: QC-S15721-01
Generated on 07/20/2020

Report to

Attention: Andrew Lorenz
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S15721.01
Project: 30042872.04600 / RACER Lansing
Submitted Date/Time: 07/16/2020 09:52
Sampled by: Austin Westhuis
P.O. #: 30042872.04600

QC Report Sections

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Surrogates per QC Sample (Page 5)
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Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S15721.01

Sample Tag: VAP-P2-ND131(66-70)(071620)

Collected Date/Time: 07/16/2020 09:25

Matrix: Groundwater

COC Reference: 124311

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	07/16/20 13:12	200715A9	VS200716W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS200716W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15721.01	1,4-Dioxane	SW8260B - SIM	07/16/20 13:12	200715A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S15721.01

Sample Tag: VAP-P2-ND131(66-70)(071620)

Collected Date/Time: 07/16/2020 09:25

Matrix: Groundwater

COC Reference: 124311

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200715A9, Run Date: 07/16/2020 13:12, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**60.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200716W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200715A9.BLKW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:21, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 10:18, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200715A9.LCSDW15A, Parent Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:00, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**90.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200716W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200715A9.BLKW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:21, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 10:18, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		82.3	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200715A9.LCSDW15A, Parent Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:00, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		108.1	70.0	130.0	27.1	30.0

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Phone (517) 332-0167 Fax (517) 332-4034
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C.O.C. PAGE # 1 OF 1

124311

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Andrew Lorenz
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 248-809-1813 | FAX NO.: 248-994-2241 | P.O. NO: 30042872.046000
E-MAIL ADDRESS: Andrew.Lorenz@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 30042872.046000/RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☒ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MF

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260 SIMS	Special Instructions
15721.01	7/16/20	0925	VAP-P2-ND131(66-70)(071620)	GW	3		3						X	★24-hour rush TAT ★

RELINQUISHED BY: SIGNATURE/ORGANIZATION [signature] / Arcadis ☒ Sampler — DATE 7/16/20 — TIME 0952
RECEIVED BY: SIGNATURE/ORGANIZATION Merit Lab drop box — DATE 7/16/20 — TIME 0952
RELINQUISHED BY: SIGNATURE/ORGANIZATION — DATE — TIME
RECEIVED BY: SIGNATURE/ORGANIZATION — DATE — TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION Merit Drop Box — DATE 7/16/2020 — TIME 0952
RECEIVED BY: SIGNATURE/ORGANIZATION M Mitchell — DATE 7/16/2020 — TIME 0952

SEAL NO | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES | TEMP ON ARRIVAL 4.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Quality Control Report

Report ID: QC-S15763-01
Generated on 07/20/2020

Report to

Attention: Andrew Lorenz
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S15763.01
Project: 30042872.04600 / RACER Lansing
Submitted Date/Time: 07/16/2020 15:30
Sampled by: Austin Westhuis
P.O. #: 30042872.04600

QC Report Sections

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Analysis Summary (Page 2)
Prep Batch Summary (Page 3)
Surrogates per Lab Sample (Page 4)
Surrogates per QC Sample (Page 5)
Batch QC Results (Page 6)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S15763.01

Sample Tag: VAP-P2-OP97(65-69)(071620)

Collected Date/Time: 07/16/2020 14:40

Matrix: Groundwater

COC Reference: 124310

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	07/16/20 17:09	200715A9	VS200716W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS200716W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15763.01	1,4-Dioxane	SW8260B - SIM	07/16/20 17:09	200715A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S15763.01

Sample Tag: VAP-P2-OP97(65-69)(071620)

Collected Date/Time: 07/16/2020 14:40

Matrix: Groundwater

COC Reference: 124310

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 200715A9, Run Date: 07/16/2020 17:09, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS200716W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200715A9.BLKW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:21, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 10:18, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**80.0**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200715A9.LCSDW15A, Parent Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:00, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D		**90.0**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS200716W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 200715A9.BLKW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:21, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 10:18, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		82.3	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200715A9.LCSDW15A, Parent Sample ID: 200715A9.LCSW15A

Run in Batch: 200715A9, Run Date: 07/16/2020 11:00, Prep Date: 07/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		108.1	70.0	130.0	27.1	30.0

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124310

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Andrew Lorenz
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE:
PHONE NO.: 248-809-1813 FAX NO: 248-994-2241 P.O. NO.: 30042872.04600
E-MAIL ADDRESS: Andrew.Lorenz@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04600 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☒ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	ANALYSIS: 1,4-Dioxane 8260 SIMS	Special Instructions
15763.01	7/16/20	1440	VAP-P2-OP97(65-69)(071620)	GW	3		3						X	★24-hour rush TAT★

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	[signature] / Arcadis ☒ Sampler	7/16/20	1530
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Lab drop box	7/16/20	1530
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	Merit Drop Box	7/16/2020	1530
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	7/16/2020	1530

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL 2.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S15872-01
Generated on 07/24/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S15872.01-S15872.07
Project: RACER Lansing
Submitted Date/Time: 07/21/2020 15:47
Sampled by: Kara Donahue
P.O. #: 30042872.04600

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-8)
Prep Batch Summary (Page 9)
Surrogates per Lab Sample (Pages 10-14)
Surrogates per QC Sample (Page 15)
Batch QC Results (Pages 16-23)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S15872.01

Sample Tag: VAP-OS-LV263_8-13

Collected Date/Time: 07/21/2020 12:42

Matrix: Groundwater

COC Reference: 135816

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 18:52	200722A9	VF200722W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S15872.02
Sample Tag: VAP-OS-LY263_9-14
Collected Date/Time: 07/21/2020 13:03
Matrix: Groundwater
COC Reference: 135816

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 19:11	200722A9	VF200722W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S15872.03
Sample Tag: DUP-01
Collected Date/Time: 07/21/2020 00:01
Matrix: Groundwater
COC Reference: 135816

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 19:31	200722A9	VF200722W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S15872.04

Sample Tag: VAP-OS-MB263_5-10

Collected Date/Time: 07/21/2020 13:37

Matrix: Groundwater

COC Reference: 135816

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 15:20	200722A9	VF200722W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S15872.05

Sample Tag: VAP-OS-MB263_5-10 MS

Collected Date/Time: 07/21/2020 13:37

Matrix: Groundwater

COC Reference: 135816

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 21:06	200722A9	VF200722W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S15872.06

Sample Tag: VAP-OS-MB263_5-10 MSD

Collected Date/Time: 07/21/2020 13:37

Matrix: Groundwater

COC Reference: 135816

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 21:25	200722A9	VF200722W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S15872.07

Sample Tag: Trip Blank

Collected Date/Time: 07/21/2020 00:01

Matrix: Water

COC Reference: 135816

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 14:04	200722A9	VF200722W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF200722W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S15872.01	Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 18:52	200722A9
S15872.02	Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 19:11	200722A9
S15872.03	Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 19:31	200722A9
S15872.04	Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 15:20	200722A9
S15872.05	Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 21:06	200722A9
S15872.06	Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 21:25	200722A9
S15872.07	Volatile Organics - DEQ List	SW5030C/8260C	07/22/20 14:04	200722A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S15872.01

Sample Tag: VAP-OS-LV263_8-13

Collected Date/Time: 07/21/2020 12:42

Matrix: Groundwater

COC Reference: 135816

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200722A9, Run Date: 07/22/2020 18:52, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.6**	80.0	124.0
1,2-Dichloroethane-D4		**106.3**	72.0	125.0
Toluene-D8		**98.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S15872.02

Sample Tag: VAP-OS-LY263_9-14

Collected Date/Time: 07/21/2020 13:03

Matrix: Groundwater

COC Reference: 135816

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200722A9, Run Date: 07/22/2020 19:11, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.5**	80.0	124.0
1,2-Dichloroethane-D4		**107.0**	72.0	125.0
Toluene-D8		**98.6**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S15872.03

Sample Tag: DUP-01

Collected Date/Time: 07/21/2020 00:01

Matrix: Groundwater

COC Reference: 135816

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200722A9, Run Date: 07/22/2020 19:31, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.3**	80.0	124.0
1,2-Dichloroethane-D4		**106.1**	72.0	125.0
Toluene-D8		**99.1**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S15872.04

Sample Tag: VAP-OS-MB263_5-10

Collected Date/Time: 07/21/2020 13:37

Matrix: Groundwater

COC Reference: 135816

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200722A9, Run Date: 07/22/2020 15:20, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.0**	80.0	124.0
1,2-Dichloroethane-D4		**107.0**	72.0	125.0
Toluene-D8		**98.8**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S15872.07

Sample Tag: Trip Blank

Collected Date/Time: 07/21/2020 00:01

Matrix: Water

COC Reference: 135816

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200722A9, Run Date: 07/22/2020 14:04, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.9**	80.0	124.0
1,2-Dichloroethane-D4		**105.5**	72.0	125.0
Toluene-D8		**98.8**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF200722W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 200722A9.BLKW22A

Run in Batch: 200722A9, Run Date: 07/22/2020 12:09, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.2**	80.0	124.0
1,2-Dichloroethane-D4		**100.3**	72.0	125.0
Toluene-D8		**98.4**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200722A9.LCSW22A

Run in Batch: 200722A9, Run Date: 07/22/2020 10:52, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**99.5**	80.0	124.0
1,2-Dichloroethane-D4		**103.6**	72.0	125.0
Toluene-D8		**101.1**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200722A9.LCSDW22A, Parent Sample ID: 200722A9.LCSW22A

Run in Batch: 200722A9, Run Date: 07/22/2020 11:11, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.3**	80.0	124.0
1,2-Dichloroethane-D4		**99.6**	72.0	125.0
Toluene-D8		**101.3**	89.0	112.0

Matrix Spike (MS)

Lab Sample ID: 200722A9.1587205M, Parent Sample ID: S15872.04

Run in Batch: 200722A9, Run Date: 07/22/2020 21:06, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**92.7**	80.0	124.0
1,2-Dichloroethane-D4		**100.7**	72.0	125.0
Toluene-D8		**101.4**	89.0	112.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200722A9.1587206N, Parent Sample ID: 200722A9.1587205M

Run in Batch: 200722A9, Run Date: 07/22/2020 21:25, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**97.1**	80.0	124.0
1,2-Dichloroethane-D4		**96.6**	72.0	125.0
Toluene-D8		**101.2**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200722W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 200722A9.BLKW22A

Run in Batch: 200722A9, Run Date: 07/22/2020 12:09, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride	*	1.23	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF200722W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK) (continued)

Lab Sample ID: 200722A9.BLKW22A

Run in Batch: 200722A9, Run Date: 07/22/2020 12:09, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200722A9.LCSW22A

Run in Batch: 200722A9, Run Date: 07/22/2020 10:52, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		105.7	67.4	121.2
Acetone		107.9	29.9	161.5
Methyl iodide		108.7	68.8	116.4
Carbon disulfide		114.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		107.9	73.2	122.4
Acrylonitrile		109.3	69.9	128.9
2-Butanone (MEK)		111.0	44.0	134.4
Dichlorodifluoromethane		100.3	10.0	222.8
Chloromethane		103.3	23.8	166.5
Vinyl chloride		106.1	43.5	149.1
Bromomethane		101.5	56.8	151.3
Chloroethane		106.4	53.4	149.4
Trichlorofluoromethane		108.9	59.7	151.8
1,1-Dichloroethene		108.0	69.6	139.4
Methylene chloride		101.1	73.3	121.1
trans-1,2-Dichloroethene		107.4	73.6	129.3
1,1-Dichloroethane		107.0	71.5	126.2
cis-1,2-Dichloroethene		105.3	76.6	122.1
Tetrahydrofuran		109.5	59.0	117.9
Chloroform		107.5	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200722W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200722A9.LCSW22A

Run in Batch: 200722A9, Run Date: 07/22/2020 10:52, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		107.2	78.2	120.8
1,1,1-Trichloroethane		110.9	79.4	130.9
4-Methyl-2-pentanone (MIBK)		111.0	71.6	125.2
2-Hexanone		110.1	55.4	136.9
Carbon tetrachloride		113.0	72.6	133.0
Benzene		105.5	79.9	124.9
1,2-Dichloroethane		104.0	76.0	126.3
Trichloroethene		106.9	79.7	124.2
1,2-Dichloropropane		107.2	78.6	126.4
Bromodichloromethane		111.2	80.4	128.2
Dibromomethane		105.0	76.9	122.1
cis-1,3-Dichloropropene		103.6	79.8	129.9
Toluene		107.1	79.8	124.5
trans-1,3-Dichloropropene		104.3	74.0	131.3
1,1,2-Trichloroethane		106.7	78.7	123.1
Tetrachloroethene	*	126.1	74.5	124.5
trans-1,4-Dichloro-2-butene		93.4	68.6	135.4
Dibromochloromethane		114.4	74.6	127.2
1,2-Dibromoethane		108.3	70.3	133.7
Chlorobenzene		105.0	79.2	122.7
1,1,1,2-Tetrachloroethane		109.8	80.3	128.2
Ethylbenzene		109.4	79.5	129.1
p,m-Xylene		108.8	79.4	132.2
o-Xylene		111.3	80.2	131.0
Styrene		111.1	69.5	126.7
Isopropylbenzene		111.3	74.4	121.5
Bromoform		115.8	69.4	128.0
1,1,2,2-Tetrachloroethane		105.5	79.8	126.3
1,2,3-Trichloropropane		106.4	78.3	138.8
n-Propylbenzene		109.9	82.0	130.7
Bromobenzene		104.3	78.7	124.6
1,3,5-Trimethylbenzene		107.8	81.3	128.9
tert-Butylbenzene		109.4	80.7	128.9
1,2,4-Trimethylbenzene		107.2	81.4	130.8
sec-Butylbenzene		111.0	77.4	129.8
p-Isopropyltoluene		111.5	79.8	137.5
1,3-Dichlorobenzene		106.9	77.0	131.3
1,4-Dichlorobenzene		104.7	20.7	137.7
1,2-Dichlorobenzene		105.6	10.0	166.2
1,2,3-Trimethylbenzene		106.4	76.3	124.2
n-Butylbenzene		107.3	80.0	133.3
Hexachloroethane		112.2	23.8	138.1
1,2-Dibromo-3-chloropropane		116.6	21.2	189.4
1,2,4-Trichlorobenzene		104.5	27.4	143.4
1,2,3-Trichlorobenzene		104.5	75.4	131.4
Naphthalene		115.3	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200722W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200722A9.LCSW22A

Run in Batch: 200722A9, Run Date: 07/22/2020 10:52, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		116.2	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200722A9.LCSDW22A, Parent Sample ID: 200722A9.LCSW22A

Run in Batch: 200722A9, Run Date: 07/22/2020 11:11, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		113.5	67.4	121.2	7.2	30.0
Acetone		112.5	29.9	161.5	4.2	30.0
Methyl iodide	*	117.0	68.8	116.4	7.4	30.0
Carbon disulfide		121.5	63.8	137.4	5.8	30.0
tert-Methyl butyl ether (MTBE)		116.4	73.2	122.4	7.6	30.0
Acrylonitrile		115.7	69.9	128.9	5.7	30.0
2-Butanone (MEK)		112.6	44.0	134.4	1.4	30.0
Dichlorodifluoromethane		106.4	10.0	222.8	6.0	30.0
Chloromethane		111.5	23.8	166.5	7.6	30.0
Vinyl chloride		113.2	43.5	149.1	6.4	30.0
Bromomethane		107.8	56.8	151.3	6.0	30.0
Chloroethane		111.4	53.4	149.4	4.6	30.0
Trichlorofluoromethane		113.3	59.7	151.8	3.9	30.0
1,1-Dichloroethene		115.2	69.6	139.4	6.5	30.0
Methylene chloride		109.7	73.3	121.1	8.1	30.0
trans-1,2-Dichloroethene		114.6	73.6	129.3	6.5	30.0
1,1-Dichloroethane		114.9	71.5	126.2	7.1	30.0
cis-1,2-Dichloroethene		114.0	76.6	122.1	7.9	30.0
Tetrahydrofuran		116.3	59.0	117.9	6.0	30.0
Chloroform		115.4	78.4	124.0	7.1	30.0
Bromochloromethane		115.2	78.2	120.8	7.2	30.0
1,1,1-Trichloroethane		116.9	79.4	130.9	5.2	30.0
4-Methyl-2-pentanone (MIBK)		118.9	71.6	125.2	6.9	30.0
2-Hexanone		118.2	55.4	136.9	7.1	30.0
Carbon tetrachloride		119.0	72.6	133.0	5.2	30.0
Benzene		112.5	79.9	124.9	6.4	30.0
1,2-Dichloroethane		111.9	76.0	126.3	7.3	30.0
Trichloroethene		114.1	79.7	124.2	6.5	30.0
1,2-Dichloropropane		114.2	78.6	126.4	6.3	30.0
Bromodichloromethane		119.5	80.4	128.2	7.2	30.0
Dibromomethane		113.8	76.9	122.1	8.1	30.0
cis-1,3-Dichloropropene		112.0	79.8	129.9	7.7	30.0
Toluene		114.6	79.8	124.5	6.8	30.0
trans-1,3-Dichloropropene		111.8	74.0	131.3	6.9	30.0
1,1,2-Trichloroethane		115.4	78.7	123.1	7.8	30.0
Tetrachloroethene		113.5	74.5	124.5	10.5	30.0
trans-1,4-Dichloro-2-butene		103.6	68.6	135.4	10.4	30.0
Dibromochloromethane		122.1	74.6	127.2	6.6	30.0
1,2-Dibromoethane		115.9	70.3	133.7	6.8	30.0
Chlorobenzene		113.0	79.2	122.7	7.4	30.0

Organics - Volatiles, Prep Batch ID: VF200722W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200722A9.LCSDW22A, Parent Sample ID: 200722A9.LCSW22A

Run in Batch: 200722A9, Run Date: 07/22/2020 11:11, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		117.7	80.3	128.2	6.9	30.0
Ethylbenzene		116.5	79.5	129.1	6.3	30.0
p,m-Xylene		117.4	79.4	132.2	7.6	30.0
o-Xylene		119.4	80.2	131.0	7.0	30.0
Styrene		120.4	69.5	126.7	8.1	30.0
Isopropylbenzene		118.8	74.4	121.5	6.5	30.0
Bromoform		124.7	69.4	128.0	7.4	30.0
1,1,2,2-Tetrachloroethane		113.4	79.8	126.3	7.2	30.0
1,2,3-Trichloropropane		114.7	78.3	138.8	7.5	30.0
n-Propylbenzene		117.5	82.0	130.7	6.7	30.0
Bromobenzene		112.4	78.7	124.6	7.4	30.0
1,3,5-Trimethylbenzene		116.2	81.3	128.9	7.6	30.0
tert-Butylbenzene		117.9	80.7	128.9	7.5	30.0
1,2,4-Trimethylbenzene		115.9	81.4	130.8	7.8	30.0
sec-Butylbenzene		117.5	77.4	129.8	5.7	30.0
p-Isopropyltoluene		118.7	79.8	137.5	6.2	30.0
1,3-Dichlorobenzene		112.7	77.0	131.3	5.3	30.0
1,4-Dichlorobenzene		111.8	20.7	137.7	6.6	30.0
1,2-Dichlorobenzene		113.4	10.0	166.2	7.2	30.0
1,2,3-Trimethylbenzene		113.2	76.3	124.2	6.2	30.0
n-Butylbenzene		113.8	80.0	133.3	6.0	30.0
Hexachloroethane		119.4	23.8	138.1	6.1	30.0
1,2-Dibromo-3-chloropropane		122.4	21.2	189.4	4.9	30.0
1,2,4-Trichlorobenzene		111.0	27.4	143.4	6.0	30.0
1,2,3-Trichlorobenzene		112.3	75.4	131.4	7.2	30.0
Naphthalene		121.1	32.9	135.8	4.9	30.0
2-Methylnaphthalene		124.2	25.5	165.5	6.7	30.0

Matrix Spike (MS)

Lab Sample ID: 200722A9.1587205M, Parent Sample ID: S15872.04

Run in Batch: 200722A9, Run Date: 07/22/2020 21:06, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		99.8	67.4	121.2
Acetone		103.0	29.9	161.5
Methyl iodide		94.1	68.8	116.4
Carbon disulfide		87.0	63.8	137.4
tert-Methyl butyl ether (MTBE)		100.8	73.2	122.4
Acrylonitrile		103.7	69.9	128.9
2-Butanone (MEK)		102.7	44.0	134.4
Dichlorodifluoromethane		58.4	10.0	222.8
Chloromethane		78.6	23.8	166.5
Vinyl chloride		80.5	43.5	149.1
Bromomethane		84.7	56.8	151.3
Chloroethane		87.7	53.4	149.4
Trichlorofluoromethane		87.0	59.7	151.8
1,1-Dichloroethene		90.3	69.6	139.4

Organics - Volatiles, Prep Batch ID: VF200722W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 200722A9.1587205M, Parent Sample ID: S15872.04

Run in Batch: 200722A9, Run Date: 07/22/2020 21:06, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Methylene chloride		95.6	73.3	121.1
trans-1,2-Dichloroethene		96.5	73.6	129.3
1,1-Dichloroethane		99.5	71.5	126.2
cis-1,2-Dichloroethene		101.9	76.6	122.1
Tetrahydrofuran		105.3	59.0	117.9
Chloroform		102.2	78.4	124.0
Bromochloromethane		101.5	78.2	120.8
1,1,1-Trichloroethane		96.1	79.4	130.9
4-Methyl-2-pentanone (MIBK)		105.3	71.6	125.2
2-Hexanone		110.5	55.4	136.9
Carbon tetrachloride		91.4	72.6	133.0
Benzene		97.0	79.9	124.9
1,2-Dichloroethane		97.5	76.0	126.3
Trichloroethene		95.4	79.7	124.2
1,2-Dichloropropane		100.3	78.6	126.4
Bromodichloromethane		101.2	80.4	128.2
Dibromomethane		97.9	76.9	122.1
cis-1,3-Dichloropropene		101.3	79.8	129.9
Toluene		99.1	79.8	124.5
trans-1,3-Dichloropropene		101.4	74.0	131.3
1,1,2-Trichloroethane		101.8	78.7	123.1
Tetrachloroethene		90.2	74.5	124.5
trans-1,4-Dichloro-2-butene		88.5	68.6	135.4
Dibromochloromethane		93.8	74.6	127.2
1,2-Dibromoethane		93.4	70.3	133.7
Chlorobenzene		92.0	79.2	122.7
1,1,1,2-Tetrachloroethane		92.8	80.3	128.2
Ethylbenzene		93.9	79.5	129.1
p,m-Xylene		92.2	79.4	132.2
o-Xylene		96.1	80.2	131.0
Styrene		97.2	69.5	126.7
Isopropylbenzene		94.6	74.4	121.5
Bromoform		89.7	69.4	128.0
1,1,2,2-Tetrachloroethane		96.0	79.8	126.3
1,2,3-Trichloropropane		91.3	78.3	138.8
n-Propylbenzene		93.2	82.0	130.7
Bromobenzene		91.3	78.7	124.6
1,3,5-Trimethylbenzene		91.4	81.3	128.9
tert-Butylbenzene		92.6	80.7	128.9
1,2,4-Trimethylbenzene		92.3	81.4	130.8
sec-Butylbenzene		99.5	77.4	129.8
p-Isopropyltoluene		101.4	79.8	137.5
1,3-Dichlorobenzene		98.2	77.0	131.3
1,4-Dichlorobenzene		98.8	20.7	137.7
1,2-Dichlorobenzene		100.0	10.0	166.2
1,2,3-Trimethylbenzene		101.1	76.3	124.2

Organics - Volatiles, Prep Batch ID: VF200722W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike (MS) (continued)

Lab Sample ID: 200722A9.1587205M, Parent Sample ID: S15872.04

Run in Batch: 200722A9, Run Date: 07/22/2020 21:06, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
n-Butylbenzene		96.8	80.0	133.3
Hexachloroethane		92.8	23.8	138.1
1,2-Dibromo-3-chloropropane		103.4	21.2	189.4
1,2,4-Trichlorobenzene		96.8	27.4	143.4
1,2,3-Trichlorobenzene		94.1	75.4	131.4
Naphthalene		107.6	32.9	135.8
2-Methylnaphthalene		113.1	25.5	165.5

Matrix Spike Duplicate (MSD)

Lab Sample ID: 200722A9.1587206N, Parent Sample ID: 200722A9.1587205M

Run in Batch: 200722A9, Run Date: 07/22/2020 21:25, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		117.7	67.4	121.2	16.4	30.0
Acetone		119.4	29.9	161.5	14.7	30.0
Methyl iodide	*	120.3	68.8	116.4	24.5	30.0
Carbon disulfide	*	118.4	63.8	137.4	30.6	30.0
tert-Methyl butyl ether (MTBE)	*	125.6	73.2	122.4	21.9	30.0
Acrylonitrile		123.5	69.9	128.9	17.5	30.0
2-Butanone (MEK)		120.8	44.0	134.4	16.2	30.0
Dichlorodifluoromethane	*	80.8	10.0	222.8	32.3	30.0
Chloromethane		101.3	23.8	166.5	25.2	30.0
Vinyl chloride		107.0	43.5	149.1	28.3	30.0
Bromomethane		107.8	56.8	151.3	24.0	30.0
Chloroethane		113.9	53.4	149.4	26.0	30.0
Trichlorofluoromethane		115.4	59.7	151.8	28.1	30.0
1,1-Dichloroethene		119.1	69.6	139.4	27.5	30.0
Methylene chloride		116.9	73.3	121.1	20.0	30.0
trans-1,2-Dichloroethene		122.1	73.6	129.3	23.4	30.0
1,1-Dichloroethane		124.1	71.5	126.2	22.0	30.0
cis-1,2-Dichloroethene	*	124.9	76.6	122.1	20.3	30.0
Tetrahydrofuran	*	123.2	59.0	117.9	15.7	30.0
Chloroform	*	125.7	78.4	124.0	20.6	30.0
Bromochloromethane	*	123.9	78.2	120.8	19.8	30.0
1,1,1-Trichloroethane		125.7	79.4	130.9	26.7	30.0
4-Methyl-2-pentanone (MIBK)	*	126.6	71.6	125.2	18.4	30.0
2-Hexanone		126.7	55.4	136.9	13.7	30.0
Carbon tetrachloride	*	126.7	72.6	133.0	32.3	30.0
Benzene		122.4	79.9	124.9	23.1	30.0
1,2-Dichloroethane		120.3	76.0	126.3	20.9	30.0
Trichloroethene		121.7	79.7	124.2	24.2	30.0
1,2-Dichloropropane		125.5	78.6	126.4	22.3	30.0
Bromodichloromethane		127.4	80.4	128.2	22.9	30.0
Dibromomethane		120.2	76.9	122.1	20.5	30.0
cis-1,3-Dichloropropene		125.8	79.8	129.9	21.6	30.0
Toluene	*	124.6	79.8	124.5	22.8	30.0
trans-1,3-Dichloropropene		127.8	74.0	131.3	23.1	30.0

Organics - Volatiles, Prep Batch ID: VF200722W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: 200722A9.1587206N, Parent Sample ID: 200722A9.1587205M

Run in Batch: 200722A9, Run Date: 07/22/2020 21:25, Prep Date: 07/22/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,2-Trichloroethane	*	124.8	78.7	123.1	20.3	30.0
Tetrachloroethene		115.3	74.5	124.5	24.4	30.0
trans-1,4-Dichloro-2-butene		115.8	68.6	135.4	26.8	30.0
Dibromochloromethane	*	127.5	74.6	127.2	30.5	30.0
1,2-Dibromoethane		122.6	70.3	133.7	27.0	30.0
Chlorobenzene		121.2	79.2	122.7	27.4	30.0
1,1,1,2-Tetrachloroethane	*	127.1	80.3	128.2	31.1	30.0
Ethylbenzene	*	127.6	79.5	129.1	30.5	30.0
p,m-Xylene	*	125.9	79.4	132.2	30.5	30.0
o-Xylene	*	130.4	80.2	131.0	30.3	30.0
Styrene	*	130.9	69.5	126.7	29.5	30.0
Isopropylbenzene	*	129.4	74.4	121.5	31.1	30.0
Bromoform	*	125.7	69.4	128.0	33.4	30.0
1,1,2,2-Tetrachloroethane		124.0	79.8	126.3	25.5	30.0
1,2,3-Trichloropropane		121.8	78.3	138.8	28.6	30.0
n-Propylbenzene	*	126.6	82.0	130.7	30.4	30.0
Bromobenzene		121.4	78.7	124.6	28.3	30.0
1,3,5-Trimethylbenzene	*	123.8	81.3	128.9	30.1	30.0
tert-Butylbenzene	*	125.9	80.7	128.9	30.4	30.0
1,2,4-Trimethylbenzene		124.9	81.4	130.8	30.0	30.0
sec-Butylbenzene	*	129.9	77.4	129.8	26.5	30.0
p-Isopropyltoluene		132.2	79.8	137.5	26.4	30.0
1,3-Dichlorobenzene		127.6	77.0	131.3	26.1	30.0
1,4-Dichlorobenzene		126.0	20.7	137.7	24.2	30.0
1,2-Dichlorobenzene		127.7	10.0	166.2	24.3	30.0
1,2,3-Trimethylbenzene	*	130.6	76.3	124.2	25.5	30.0
n-Butylbenzene		123.2	80.0	133.3	24.0	30.0
Hexachloroethane	*	127.3	23.8	138.1	31.3	30.0
1,2-Dibromo-3-chloropropane		131.3	21.2	189.4	23.8	30.0
1,2,4-Trichlorobenzene		122.4	27.4	143.4	23.4	30.0
1,2,3-Trichlorobenzene		118.5	75.4	131.4	22.9	30.0
Naphthalene	*	136.0	32.9	135.8	23.3	30.0
2-Methylnaphthalene		139.8	25.5	165.5	21.1	30.0

Merit Laboratories, Inc.
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Phone (517) 332-0167 Fax (517) 332-4034
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C.O.C. PAGE # 1 OF 1

135816

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☐ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kara Donahue

TURNAROUND TIME REQUIRED ☐ 1 DAY ☒ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM5030C 8260C	Special Instructions
15872.01	7/21/20	12:42	VAP-OS-LV263	GW	3		3						X	
.02	7/21/20	13:03	VAP-OS-LY263	GW	3		3						X	
.03			DUP-01	GW	3		3						X	
.04/.05/.06	7/21/20	13:37	VAP-OS-MB263	GW	9		9						X	3 for MS and 3 for MSD
.07	7/21/20		Trip Blank		1								X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Kara Donahue/Arcadis ☒ Sampler	DATE: 7/21/20	TIME: 1547	
RECEIVED BY: SIGNATURE/ORGANIZATION: M Gilcrease	DATE: 7/21/2020	TIME: 1547	
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	

RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
SEAL NO.:	SEAL INTACT YES ☐ NO ☐	INITIALS:	NOTES: TEMP. ON ARRIVAL: 20.2
SEAL NO.:	SEAL INTACT YES ☐ NO ☐	INITIALS:	

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Quality Control Report

Report ID: QC-S16026-01
Generated on 07/28/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S16026.01-S16026.03
Project: RACER Lansing
Submitted Date/Time: 07/24/2020 19:00
Sampled by: Kara Donahue
P.O. #: 30042872.04600

QC Report Sections

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Surrogates per QC Sample (Page 9)
Batch QC Results (Pages 10-16)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

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Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S16026.01
Sample Tag: VAP-OS-MA266_7-12
Collected Date/Time: 07/24/2020 11:53
Matrix: Groundwater
COC Reference: 135926

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	07/28/20 00:56	200727B9	VF200727W2	Yes	BLK/LCS/LCSD/MS

QC Report - Analysis Summary

Lab Sample ID: S16026.02
Sample Tag: VAP-OS-MC268_7-12
Collected Date/Time: 07/24/2020 13:15
Matrix: Groundwater
COC Reference: 135926

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	07/28/20 01:15	200727B9	VF200727W2	Yes	BLK/LCS/LCSD/MS

QC Report - Analysis Summary

Lab Sample ID: S16026.03
Sample Tag: Trip Blank
Collected Date/Time: 07/24/2020 00:01
Matrix: Water
COC Reference: 135926

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	07/27/20 22:01	200727B9	VF200727W2	Yes	BLK/LCS/LCSD/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF200727W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S16026.01	Volatile Organics - DEQ List	SW5030C/8260C	07/28/20 00:56	200727B9
S16026.02	Volatile Organics - DEQ List	SW5030C/8260C	07/28/20 01:15	200727B9
S16026.03	Volatile Organics - DEQ List	SW5030C/8260C	07/27/20 22:01	200727B9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S16026.01

Sample Tag: VAP-OS-MA266_7-12

Collected Date/Time: 07/24/2020 11:53

Matrix: Groundwater

COC Reference: 135926

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200727B9, Run Date: 07/28/2020 00:56, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**99.0**	80.0	124.0
1,2-Dichloroethane-D4		**101.4**	72.0	125.0
Toluene-D8		**99.1**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S16026.02

Sample Tag: VAP-OS-MC268_7-12

Collected Date/Time: 07/24/2020 13:15

Matrix: Groundwater

COC Reference: 135926

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200727B9, Run Date: 07/28/2020 01:15, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.7**	80.0	124.0
1,2-Dichloroethane-D4		**98.8**	72.0	125.0
Toluene-D8		**98.7**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S16026.03

Sample Tag: Trip Blank

Collected Date/Time: 07/24/2020 00:01

Matrix: Water

COC Reference: 135926

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 200727B9, Run Date: 07/27/2020 22:01, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**97.5**	80.0	124.0
1,2-Dichloroethane-D4		**99.1**	72.0	125.0
Toluene-D8		**98.4**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF200727W2

QC Types: BLK/LCS/LCSD/MS

Blank (BLK)

Lab Sample ID: 200727B9.BLKW27B

Run in Batch: 200727B9, Run Date: 07/27/2020 21:42, Prep Date: 07/27/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**98.8**	80.0	124.0
1,2-Dichloroethane-D4		**99.3**	72.0	125.0
Toluene-D8		**98.4**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 200727B9.LCSW27B

Run in Batch: 200727B9, Run Date: 07/27/2020 20:24, Prep Date: 07/27/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**102.2**	80.0	124.0
1,2-Dichloroethane-D4		**98.3**	72.0	125.0
Toluene-D8		**101.0**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200727B9.LCSDW27B, Parent Sample ID: 200727B9.LCSW27B

Run in Batch: 200727B9, Run Date: 07/27/2020 20:43, Prep Date: 07/27/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**102.9**	80.0	124.0
1,2-Dichloroethane-D4		**97.2**	72.0	125.0
Toluene-D8		**101.1**	89.0	112.0

Matrix Spike (MS)

Lab Sample ID: 200727B9.1593603M, Parent Sample ID: S15936.03

Run in Batch: 200727B9, Run Date: 07/28/2020 04:49, Prep Date: 07/27/2020, Matrix: WW, Dilution: 100

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**102.8**	80.0	124.0
1,2-Dichloroethane-D4		**98.6**	72.0	125.0
Toluene-D8		**101.3**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF200727W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS

Blank (BLK)

Lab Sample ID: 200727B9.BLKW27B

Run in Batch: 200727B9, Run Date: 07/27/2020 21:42, Prep Date: 07/27/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride	*	1.51	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF200727W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS

Blank (BLK) (continued)

Lab Sample ID: 200727B9.BLKW27B

Run in Batch: 200727B9, Run Date: 07/27/2020 21:42, Prep Date: 07/27/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 200727B9.LCSW27B

Run in Batch: 200727B9, Run Date: 07/27/2020 20:24, Prep Date: 07/27/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		108.7	67.4	121.2
Acetone		106.2	29.9	161.5
Methyl iodide		114.4	68.8	116.4
Carbon disulfide		120.7	63.8	137.4
tert-Methyl butyl ether (MTBE)		116.8	73.2	122.4
Acrylonitrile		107.9	69.9	128.9
2-Butanone (MEK)		106.6	44.0	134.4
Dichlorodifluoromethane		124.9	10.0	222.8
Chloromethane		108.6	23.8	166.5
Vinyl chloride		108.4	43.5	149.1
Bromomethane		102.2	56.8	151.3
Chloroethane		105.9	53.4	149.4
Trichlorofluoromethane		107.6	59.7	151.8
1,1-Dichloroethene		112.4	69.6	139.4
Methylene chloride		107.9	73.3	121.1
trans-1,2-Dichloroethene		112.6	73.6	129.3
1,1-Dichloroethane		112.8	71.5	126.2
cis-1,2-Dichloroethene		113.4	76.6	122.1
Tetrahydrofuran		110.0	59.0	117.9
Chloroform		112.8	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF200727W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200727B9.LCSW27B

Run in Batch: 200727B9, Run Date: 07/27/2020 20:24, Prep Date: 07/27/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		113.4	78.2	120.8
1,1,1-Trichloroethane		114.0	79.4	130.9
4-Methyl-2-pentanone (MIBK)		111.2	71.6	125.2
2-Hexanone		109.1	55.4	136.9
Carbon tetrachloride		112.1	72.6	133.0
Benzene		109.8	79.9	124.9
1,2-Dichloroethane		104.9	76.0	126.3
Trichloroethene		109.4	79.7	124.2
1,2-Dichloropropane		109.6	78.6	126.4
Bromodichloromethane		112.0	80.4	128.2
Dibromomethane		109.2	76.9	122.1
cis-1,3-Dichloropropene		111.8	79.8	129.9
Toluene		112.1	79.8	124.5
trans-1,3-Dichloropropene		112.3	74.0	131.3
1,1,2-Trichloroethane		111.0	78.7	123.1
Tetrachloroethene		109.5	74.5	124.5
trans-1,4-Dichloro-2-butene		91.1	68.6	135.4
Dibromochloromethane		113.6	74.6	127.2
1,2-Dibromoethane		111.7	70.3	133.7
Chlorobenzene		110.0	79.2	122.7
1,1,1,2-Tetrachloroethane		112.5	80.3	128.2
Ethylbenzene		113.5	79.5	129.1
p,m-Xylene		114.1	79.4	132.2
o-Xylene		114.4	80.2	131.0
Styrene		117.6	69.5	126.7
Isopropylbenzene		115.2	74.4	121.5
Bromoform		112.8	69.4	128.0
1,1,2,2-Tetrachloroethane		110.0	79.8	126.3
1,2,3-Trichloropropane		107.3	78.3	138.8
n-Propylbenzene		112.8	82.0	130.7
Bromobenzene		110.5	78.7	124.6
1,3,5-Trimethylbenzene		112.0	81.3	128.9
tert-Butylbenzene		109.5	80.7	128.9
1,2,4-Trimethylbenzene		112.1	81.4	130.8
sec-Butylbenzene		110.4	77.4	129.8
p-Isopropyltoluene		112.2	79.8	137.5
1,3-Dichlorobenzene		108.8	77.0	131.3
1,4-Dichlorobenzene		109.1	20.7	137.7
1,2-Dichlorobenzene		110.6	10.0	166.2
1,2,3-Trimethylbenzene		111.3	76.3	124.2
n-Butylbenzene		104.6	80.0	133.3
Hexachloroethane		106.1	23.8	138.1
1,2-Dibromo-3-chloropropane		114.6	21.2	189.4
1,2,4-Trichlorobenzene		107.6	27.4	143.4
1,2,3-Trichlorobenzene		103.4	75.4	131.4
Naphthalene		113.9	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF200727W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 200727B9.LCSW27B

Run in Batch: 200727B9, Run Date: 07/27/2020 20:24, Prep Date: 07/27/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		112.3	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 200727B9.LCSDW27B, Parent Sample ID: 200727B9.LCSW27B

Run in Batch: 200727B9, Run Date: 07/27/2020 20:43, Prep Date: 07/27/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		109.3	67.4	121.2	0.6	30.0
Acetone		106.9	29.9	161.5	0.7	30.0
Methyl iodide		116.3	68.8	116.4	1.7	30.0
Carbon disulfide		123.6	63.8	137.4	2.4	30.0
tert-Methyl butyl ether (MTBE)		117.4	73.2	122.4	0.5	30.0
Acrylonitrile		108.3	69.9	128.9	0.4	30.0
2-Butanone (MEK)		106.4	44.0	134.4	0.1	30.0
Dichlorodifluoromethane		127.4	10.0	222.8	2.0	30.0
Chloromethane		111.6	23.8	166.5	2.8	30.0
Vinyl chloride		109.6	43.5	149.1	1.0	30.0
Bromomethane		104.1	56.8	151.3	1.9	30.0
Chloroethane		106.7	53.4	149.4	0.7	30.0
Trichlorofluoromethane		108.9	59.7	151.8	1.2	30.0
1,1-Dichloroethene		114.3	69.6	139.4	1.7	30.0
Methylene chloride		109.0	73.3	121.1	1.0	30.0
trans-1,2-Dichloroethene		114.0	73.6	129.3	1.3	30.0
1,1-Dichloroethane		114.3	71.5	126.2	1.3	30.0
cis-1,2-Dichloroethene		115.7	76.6	122.1	2.0	30.0
Tetrahydrofuran		109.7	59.0	117.9	0.3	30.0
Chloroform		113.9	78.4	124.0	1.0	30.0
Bromochloromethane		113.8	78.2	120.8	0.3	30.0
1,1,1-Trichloroethane		115.5	79.4	130.9	1.3	30.0
4-Methyl-2-pentanone (MIBK)		110.8	71.6	125.2	0.4	30.0
2-Hexanone		108.5	55.4	136.9	0.5	30.0
Carbon tetrachloride		114.9	72.6	133.0	2.5	30.0
Benzene		111.2	79.9	124.9	1.3	30.0
1,2-Dichloroethane		105.8	76.0	126.3	0.8	30.0
Trichloroethene		109.7	79.7	124.2	0.3	30.0
1,2-Dichloropropane		111.7	78.6	126.4	2.0	30.0
Bromodichloromethane		114.1	80.4	128.2	1.9	30.0
Dibromomethane		110.1	76.9	122.1	0.8	30.0
cis-1,3-Dichloropropene		113.0	79.8	129.9	1.0	30.0
Toluene		114.1	79.8	124.5	1.8	30.0
trans-1,3-Dichloropropene		113.7	74.0	131.3	1.2	30.0
1,1,2-Trichloroethane		112.0	78.7	123.1	0.9	30.0
Tetrachloroethene		110.0	74.5	124.5	0.5	30.0
trans-1,4-Dichloro-2-butene		93.2	68.6	135.4	2.3	30.0
Dibromochloromethane		115.8	74.6	127.2	1.9	30.0
1,2-Dibromoethane		112.7	70.3	133.7	0.9	30.0
Chlorobenzene		113.5	79.2	122.7	3.1	30.0

Organics - Volatiles, Prep Batch ID: VF200727W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 200727B9.LCSDW27B, Parent Sample ID: 200727B9.LCSW27B

Run in Batch: 200727B9, Run Date: 07/27/2020 20:43, Prep Date: 07/27/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		115.0	80.3	128.2	2.2	30.0
Ethylbenzene		116.1	79.5	129.1	2.3	30.0
p,m-Xylene		115.7	79.4	132.2	1.4	30.0
o-Xylene		117.0	80.2	131.0	2.2	30.0
Styrene		119.0	69.5	126.7	1.2	30.0
Isopropylbenzene		118.4	74.4	121.5	2.7	30.0
Bromoform		114.3	69.4	128.0	1.3	30.0
1,1,2,2-Tetrachloroethane		112.9	79.8	126.3	2.5	30.0
1,2,3-Trichloropropane		106.4	78.3	138.8	0.9	30.0
n-Propylbenzene		114.4	82.0	130.7	1.5	30.0
Bromobenzene		111.1	78.7	124.6	0.5	30.0
1,3,5-Trimethylbenzene		115.1	81.3	128.9	2.7	30.0
tert-Butylbenzene		112.2	80.7	128.9	2.4	30.0
1,2,4-Trimethylbenzene		115.0	81.4	130.8	2.6	30.0
sec-Butylbenzene		111.8	77.4	129.8	1.3	30.0
p-Isopropyltoluene		113.4	79.8	137.5	1.0	30.0
1,3-Dichlorobenzene		110.0	77.0	131.3	1.1	30.0
1,4-Dichlorobenzene		109.4	20.7	137.7	0.3	30.0
1,2-Dichlorobenzene		111.9	10.0	166.2	1.2	30.0
1,2,3-Trimethylbenzene		112.0	76.3	124.2	0.6	30.0
n-Butylbenzene		106.6	80.0	133.3	1.9	30.0
Hexachloroethane		109.0	23.8	138.1	2.7	30.0
1,2-Dibromo-3-chloropropane		111.7	21.2	189.4	2.5	30.0
1,2,4-Trichlorobenzene		108.1	27.4	143.4	0.4	30.0
1,2,3-Trichlorobenzene		104.6	75.4	131.4	1.1	30.0
Naphthalene		113.1	32.9	135.8	0.7	30.0
2-Methylnaphthalene		111.3	25.5	165.5	0.9	30.0

Matrix Spike (MS)

Lab Sample ID: 200727B9.1593603M, Parent Sample ID: S15936.03

Run in Batch: 200727B9, Run Date: 07/28/2020 04:49, Prep Date: 07/27/2020, Matrix: WW, Dilution: 100

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		73.5	67.4	121.2
Acetone		73.6	29.9	161.5
Methyl iodide		69.7	68.8	116.4
Carbon disulfide	*	62.1	63.8	137.4
tert-Methyl butyl ether (MTBE)		74.8	73.2	122.4
Acrylonitrile		76.6	69.9	128.9
2-Butanone (MEK)		73.7	44.0	134.4
Dichlorodifluoromethane		63.8	10.0	222.8
Chloromethane		69.7	23.8	166.5
Vinyl chloride		60.9	43.5	149.1
Bromomethane		58.2	56.8	151.3
Chloroethane		62.9	53.4	149.4
Trichlorofluoromethane	*	58.2	59.7	151.8
1,1-Dichloroethene	*	62.3	69.6	139.4

Organics - Volatiles, Prep Batch ID: VF200727W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS

Matrix Spike (MS) (continued)

Lab Sample ID: 200727B9.1593603M, Parent Sample ID: S15936.03

Run in Batch: 200727B9, Run Date: 07/28/2020 04:49, Prep Date: 07/27/2020, Matrix: WW, Dilution: 100

Analyte	Flags	% Rec	LCL	UCL
Methylene chloride	*	69.4	73.3	121.1
trans-1,2-Dichloroethene	*	66.6	73.6	129.3
1,1-Dichloroethane	*	69.7	71.5	126.2
cis-1,2-Dichloroethene	*	70.4	76.6	122.1
Tetrahydrofuran		79.2	59.0	117.9
Chloroform	*	71.6	78.4	124.0
Bromochloromethane	*	74.4	78.2	120.8
1,1,1-Trichloroethane	*	64.9	79.4	130.9
4-Methyl-2-pentanone (MIBK)		73.0	71.6	125.2
2-Hexanone		72.1	55.4	136.9
Carbon tetrachloride	*	61.5	72.6	133.0
Benzene	*	69.7	79.9	124.9
1,2-Dichloroethane	*	71.2	76.0	126.3
Trichloroethene	*	64.4	79.7	124.2
1,2-Dichloropropane	*	71.5	78.6	126.4
Bromodichloromethane	*	71.3	80.4	128.2
Dibromomethane	*	72.9	76.9	122.1
cis-1,3-Dichloropropene	*	70.1	79.8	129.9
Toluene	*	70.1	79.8	124.5
trans-1,3-Dichloropropene	*	69.8	74.0	131.3
1,1,2-Trichloroethane	*	75.8	78.7	123.1
Tetrachloroethene	*	59.6	74.5	124.5
trans-1,4-Dichloro-2-butene	*	56.5	68.6	135.4
Dibromochloromethane	*	72.2	74.6	127.2
1,2-Dibromoethane		74.7	70.3	133.7
Chlorobenzene	*	71.2	79.2	122.7
1,1,1,2-Tetrachloroethane	*	71.8	80.3	128.2
Ethylbenzene	*	69.8	79.5	129.1
p,m-Xylene	*	69.8	79.4	132.2
o-Xylene	*	71.8	80.2	131.0
Styrene		73.6	69.5	126.7
Isopropylbenzene	*	70.0	74.4	121.5
Bromoform		70.1	69.4	128.0
1,1,2,2-Tetrachloroethane	*	78.4	79.8	126.3
1,2,3-Trichloropropane	*	72.7	78.3	138.8
n-Propylbenzene	*	68.7	82.0	130.7
Bromobenzene	*	71.6	78.7	124.6
1,3,5-Trimethylbenzene	*	69.4	81.3	128.9
tert-Butylbenzene	*	67.1	80.7	128.9
1,2,4-Trimethylbenzene	*	69.9	81.4	130.8
sec-Butylbenzene	*	65.9	77.4	129.8
p-Isopropyltoluene	*	66.2	79.8	137.5
1,3-Dichlorobenzene	*	68.4	77.0	131.3
1,4-Dichlorobenzene		69.1	20.7	137.7
1,2-Dichlorobenzene		71.7	10.0	166.2
1,2,3-Trimethylbenzene	*	70.7	76.3	124.2

Organics - Volatiles, Prep Batch ID: VF200727W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS

Matrix Spike (MS) (continued)

Lab Sample ID: 200727B9.1593603M, Parent Sample ID: S15936.03

Run in Batch: 200727B9, Run Date: 07/28/2020 04:49, Prep Date: 07/27/2020, Matrix: WW, Dilution: 100

Analyte	Flags	% Rec	LCL	UCL
n-Butylbenzene	*	62.3	80.0	133.3
Hexachloroethane		61.0	23.8	138.1
1,2-Dibromo-3-chloropropane		72.4	21.2	189.4
1,2,4-Trichlorobenzene		66.7	27.4	143.4
1,2,3-Trichlorobenzene	*	67.4	75.4	131.4
Naphthalene		72.6	32.9	135.8
2-Methylnaphthalene		65.2	25.5	165.5

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2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
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C.O.C. PAGE # 1 OF 1

135926

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr., Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 810-225-1929 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☐ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kara Donahue

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM6200B JJ
1602601	7/24/20	11:53	VAP-OS-MA266_7-12	GW	3		X						X
-02	7/24/20	13:15	VAP-OS-MC268_8-13	GW	3		X						X
-03	7/24/20	—	Trip Blank	L	1								X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Kara Donahue	☒ Sampler	DATE: 7/24/20	TIME: 18:20
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Lab		DATE: 7/24/20	TIME: 18:20
RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit		DATE: 7/24/20	TIME: 1900
RECEIVED BY: SIGNATURE/ORGANIZATION: [illegible]		DATE: 7/24/20	TIME: 1900

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL: 18.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S15676.01(01)
Generated on 07/16/2020

Report to

Attention: Andrew Lorenz
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:
Email: andrew.lorenz@arcadis.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Addtional Contacts: Alex Villhauer, Tiffany Linder, Trevor Swarthout, Marina Samp, Eric Feenstra, Austin Westhuis

Report Summary

Lab Sample ID(s): S15676.01
Project: 30042872.04600 / RACER Lansing
Collected Date(s): 07/15/2020
Submitted Date/Time: 07/15/2020 12:11
Sampled by: Austin Westhuis
P.O. #: 30042872.04600

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Qualifier Descriptions (Page 3)
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Method Summary (Page 4)
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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Analytical Laboratory Report

Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S15676.01	VAP-P2-LW84(70-74)(071520)	Groundwater	07/15/20 11:30

Analytical Laboratory Report

Lab Sample ID: S15676.01
Sample Tag: VAP-P2-LW84(70-74)(071520)
Collected Date/Time: 07/15/2020 11:30
Matrix: Groundwater
COC Reference: 113933

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/16/20 13:20	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 07/16/20 12:27, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	290	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Merit Laboratories Login Checklist

Lab Set ID: S15676
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04600 / RACER Lansing
Submitted: 07/15/2020 12:11 Login User: MMC

Attention: Andrew Lorenz
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:
Email: andrew.lorenz@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.3
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

113933

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Andrew Lorenz
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-809-1813 FAX NO.: 248-994-2241 P.O. NO.: 30042872.04600
E-MAIL ADDRESS: Andrew.Lorenz@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04600 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☒ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260 SIMS	Special Instructions
15676.01	7/15/20	1130	VAP-P2-LW84(70-74)(071520)	GW	3		3						X	★ 24-hour rush TAT ★

RELINQUISHED BY: SIGNATURE/ORGANIZATION [signature] / Arcadis ☒ Sampler DATE 7/15/20 TIME 1211
RECEIVED BY: SIGNATURE/ORGANIZATION Merit Lab Drop Box DATE 7/15/20 TIME 1211

RELINQUISHED BY: SIGNATURE/ORGANIZATION Merit Drop Box DATE 7/15/2020 TIME 1211
RECEIVED BY: SIGNATURE/ORGANIZATION [signature] DATE 7/15/2020 TIME 1211

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES TEMP. ON ARRIVAL 3.3

★ Please notify us if you will not be able to meet this turnaround time. PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Analytical Laboratory Report

Report ID: S15710.01(01)
Generated on 07/16/2020

Report to

Attention: Andrew Lorenz
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:
Email: andrew.lorenz@arcadis.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Addtional Contacts: Alex Villhauer, Tiffany Linder, Trevor Swarthout, Marina Samp, Eric Feenstra, Austin Westhuis

Report Summary

Lab Sample ID(s): S15710.01
Project: 30042872.04600 / RACER Lansing
Collected Date(s): 07/15/2020
Submitted Date/Time: 07/15/2020 18:10
Sampled by: Austin Westhuis
P.O. #: 30042872.04600

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Sample Summary (Page 5)

Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S15710.01	VAP-P2-MM85(73-77)(071520)	Groundwater	07/15/20 17:40

Analytical Laboratory Report

Lab Sample ID: S15710.01
Sample Tag: VAP-P2-MM85(73-77)(071520)
Collected Date/Time: 07/15/2020 17:40
Matrix: Groundwater
COC Reference: 124312

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/16/20 13:20	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 07/16/20 12:50, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	32	1		ug/L	1	123-91-1	

Merit Laboratories Login Checklist

Lab Set ID: S15710
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04600 / RACER Lansing
Submitted: 07/15/2020 18:10 Login User: REJ

Attention: Andrew Lorenz
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:
Email: andrew.lorenz@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.7
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
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Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124312

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Andrew Lorenz
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-809-1813 FAX NO.: 248-994-2241 P.O. NO.: 30042872.04600
E-MAIL ADDRESS: Andrew.Lorenz@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04600 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED: ☒ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED: ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO3	H2SO4	NaOH	MeOH	OTHER	1,4-Dioxane 8260 SIMS	Special Instructions
15710.01	7/15/20	1740	VAP-P2-MW85(73-77)(071520)	GW	3		3						X	★24-hour rush TAT★

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☒ Other MI

RELINQUISHED BY: SIGNATURE/ORGANIZATION: [signature] / Arcadis ☒ Sampler DATE: 7/15/20 TIME: 1810
RECEIVED BY: SIGNATURE/ORGANIZATION: [signature] DATE: 7/15/20 TIME: 1810
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL: 4.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Please also email results to: Eric.Feenstra@arcadis.com and Austin.Westhuis@arcadis.com

Analytical Laboratory Report

Report ID: S15721.01(01)
Generated on 07/16/2020

Report to

Attention: Andrew Lorenz
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:
Email: andrew.lorenz@arcadis.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Addtional Contacts: Alex Villhauer, Tiffany Linder, Trevor Swarthout, Marina Samp, Eric Feenstra, Austin Westhuis

Report Summary

Lab Sample ID(s): S15721.01
Project: 30042872.04600 / RACER Lansing
Collected Date(s): 07/16/2020
Submitted Date/Time: 07/16/2020 09:52
Sampled by: Austin Westhuis
P.O. #: 30042872.04600

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Glossary of Abbreviations (Page 3)
Method Summary (Page 4)
Sample Summary (Page 5)

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
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MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S15721.01	VAP-P2-ND131(66-70)(071620)	Groundwater	07/16/20 09:25

Analytical Laboratory Report

Lab Sample ID: S15721.01
Sample Tag: VAP-P2-ND131(66-70)(071620)
Collected Date/Time: 07/16/2020 09:25
Matrix: Groundwater
COC Reference: 124311

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/16/20 13:20	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 07/16/20 13:12, Analyst: JML

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	148	1		ug/L	1	123-91-1	

Merit Laboratories Login Checklist

Lab Set ID:S15721
Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04600 / RACER Lansing
Submitted:07/16/2020 09:52 Login User: MMC

Attention: Andrew Lorenz
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:
Email: andrew.lorenz@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124311

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Andrew Lorenz
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 248-809-1813 | FAX NO.: 248-994-2241 | P.O. NO: 30042872.046000
E-MAIL ADDRESS: Andrew.Lorenz@arcadis.com | QUOTE NO.:

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 30042872.046000/RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☒ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MF

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4-Dioxane 8260 SIMS	Special Instructions
15721.01	7/16/20	0925	VAP-P2-ND131(66-70)(071620)	GW	3		3						X	★24-hour rush TAT ★

RELINQUISHED BY: SIGNATURE/ORGANIZATION [signature] / Arcadis ☒ Sampler — DATE 7/16/20 — TIME 0952
RECEIVED BY: SIGNATURE/ORGANIZATION Merit Lab drop box — DATE 7/16/20 — TIME 0952
RELINQUISHED BY: SIGNATURE/ORGANIZATION — DATE — TIME
RECEIVED BY: SIGNATURE/ORGANIZATION — DATE — TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION Merit Drop Box — DATE 7/16/2020 — TIME 0952
RECEIVED BY: SIGNATURE/ORGANIZATION M Mitchell — DATE 7/16/2020 — TIME 0952

SEAL NO | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES | TEMP ON ARRIVAL 4.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Analytical Laboratory Report

Report ID: S15763.01(01)
Generated on 07/17/2020

Report to

Attention: Andrew Lorenz
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:
Email: andrew.lorenz@arcadis.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Addtional Contacts: Alex Villhauer, Tiffany Linder, Trevor Swarthout, Marina Samp, Eric Feenstra, Austin Westhuis

Report Summary

Lab Sample ID(s): S15763.01
Project: 30042872.04600 / RACER Lansing
Collected Date(s): 07/16/2020
Submitted Date/Time: 07/16/2020 15:30
Sampled by: Austin Westhuis
P.O. #: 30042872.04600

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Glossary of Abbreviations (Page 3)
Method Summary (Page 4)
Sample Summary (Page 5)

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S15763.01	VAP-P2-OP97(65-69)(071620)	Groundwater	07/16/20 14:40

Analytical Laboratory Report

Lab Sample ID: S15763.01
Sample Tag: VAP-P2-OP97(65-69)(071620)
Collected Date/Time: 07/16/2020 14:40
Matrix: Groundwater
COC Reference: 124310

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/17/20 10:00	JML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 07/16/20 17:09, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	7	1		ug/L	1	123-91-1	

Merit Laboratories Login Checklist

Lab Set ID: S15763
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04600 / RACER Lansing
Submitted: 07/16/2020 15:30 Login User: MMC

Attention: Andrew Lorenz
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-809-1813 FAX:
Email: andrew.lorenz@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.3
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

124310

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Andrew Lorenz
COMPANY: Arcadis of Michigan, LLC
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE:
PHONE NO.: 248-809-1813 FAX NO: 248-994-2241 P.O. NO.: 30042872.04600
E-MAIL ADDRESS: Andrew.Lorenz@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04600 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☒ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	ANALYSIS: 1,4-Dioxane 8260 SIMS	Special Instructions
15763.01	7/16/20	1440	VAP-P2-OP97(65-69)(071620)	GW	3		3						X	★24-hour rush TAT★

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	[signature] / Arcadis ☒ Sampler	7/16/20	1530
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Lab drop box	7/16/20	1530
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
	Merit Drop Box	7/16/2020	1530
RECEIVED BY: SIGNATURE/ORGANIZATION	[signature]	7/16/2020	1530

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL 2.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S15872.01(01)
Generated on 07/23/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Trevor Swarthout, Marina Samp

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S15872.01-S15872.07
Project: RACER Lansing
Collected Date(s): 07/21/2020
Submitted Date/Time: 07/21/2020 15:47
Sampled by: Kara Donahue
P.O. #: 30042872.04600

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Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

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40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
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E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003

Analytical Laboratory Report

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S15872.01	VAP-OS-LV263_8-13	Groundwater	07/21/20 12:42
S15872.02	VAP-OS-LY263_9-14	Groundwater	07/21/20 13:03
S15872.03	DUP-01	Groundwater	07/21/20 00:01
S15872.04	VAP-OS-MB263_5-10	Groundwater	07/21/20 13:37
S15872.05	VAP-OS-MB263_5-10 MS	Groundwater	07/21/20 13:37
S15872.06	VAP-OS-MB263_5-10 MSD	Groundwater	07/21/20 13:37
S15872.07	Trip Blank	Water	07/21/20 00:01

Lab Sample ID: S15872.01
Sample Tag: VAP-OS-LV263_8-13
Collected Date/Time: 07/21/2020 12:42
Matrix: Groundwater
COC Reference: 135816

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	20.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/23/20 13:15	JLS	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 18:52, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S15872.01 (continued)
Sample Tag: VAP-OS-LV263_8-13

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 18:52, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S15872.02
Sample Tag: VAP-OS-LY263_9-14
Collected Date/Time: 07/21/2020 13:03
Matrix: Groundwater
COC Reference: 135816

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	20.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/23/20 13:15	JLS	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 19:11, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	2	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	3	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S15872.02 (continued)
Sample Tag: VAP-OS-LY263_9-14

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 19:11, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S15872.03
Sample Tag: DUP-01
Collected Date/Time: 07/21/2020 00:01
Matrix: Groundwater
COC Reference: 135816

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	20.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/23/20 13:15	JLS	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 19:31, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	2	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	3	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S15872.03 (continued)
Sample Tag: DUP-01

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 19:31, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S15872.04
Sample Tag: VAP-OS-MB263_5-10
Collected Date/Time: 07/21/2020 13:37
Matrix: Groundwater
COC Reference: 135816

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	20.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/23/20 13:15	JLS	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 15:20, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S15872.04 (continued)
Sample Tag: VAP-OS-MB263_5-10

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 15:20, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S15872.05
Sample Tag: VAP-OS-MB263_5-10 MS
Collected Date/Time: 07/21/2020 13:37
Matrix: Groundwater
COC Reference: 135816

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	20.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/23/20 13:15	JLS	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 21:06, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	50	10		ug/L	1	60-29-7	1
Acetone	52	50		ug/L	1	67-64-1	1
Methyl iodide	47	1		ug/L	1	74-88-4	1
Carbon disulfide	43	5		ug/L	1	75-15-0	1
tert-Methyl butyl ether (MTBE)	50	5		ug/L	1	1634-04-4	1
Acrylonitrile	52	2		ug/L	1	107-13-1	1
2-Butanone (MEK)	51	25		ug/L	1	78-93-3	1
Dichlorodifluoromethane	29	5		ug/L	1	75-71-8	1
Chloromethane	39	5		ug/L	1	74-87-3	1
Vinyl chloride	40	1		ug/L	1	75-01-4	1
Bromomethane	42	5		ug/L	1	74-83-9	1
Chloroethane	44	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	44	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	45	1		ug/L	1	75-35-4	1
Methylene chloride	48	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	48	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	50	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	51	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	51	1		ug/L	1	67-66-3	1
Bromochloromethane	51	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	48	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	53	50		ug/L	1	108-10-1	1
2-Hexanone	55	50		ug/L	1	591-78-6	1
Carbon tetrachloride	46	1		ug/L	1	56-23-5	1
Benzene	49	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	49	1		ug/L	1	107-06-2	1
Trichloroethene	48	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	50	1		ug/L	1	78-87-5	1
Bromodichloromethane	51	1		ug/L	1	75-27-4	1
Dibromomethane	49	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	51	1		ug/L	1	10061-01-5	1
Toluene	50	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	51	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	51	1		ug/L	1	79-00-5	1
Tetrachloroethene	45	1		ug/L	1	127-18-4	1

1-Spiked at 50ug/L

Lab Sample ID: S15872.05 (continued)
Sample Tag: VAP-OS-MB263_5-10 MS

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 21:06, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,4-Dichloro-2-butene	44	1		ug/L	1	110-57-6	1
Dibromochloromethane	47	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	47	1		ug/L	1	106-93-4	1
Chlorobenzene	46	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	46	1		ug/L	1	630-20-6	1
Ethylbenzene	47	1		ug/L	1	100-41-4	1
p,m-Xylene*	94	2		ug/L	1		1
o-Xylene	48	1		ug/L	1	95-47-6	1
Styrene	49	1		ug/L	1	100-42-5	1
Isopropylbenzene	47	5		ug/L	1	98-82-8	1
Bromoform	45	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	48	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	46	1		ug/L	1	96-18-4	1
n-Propylbenzene	47	1		ug/L	1	103-65-1	1
Bromobenzene	46	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	46	1		ug/L	1	108-67-8	1
tert-Butylbenzene	46	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	46	1		ug/L	1	95-63-6	1
sec-Butylbenzene	50	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	51	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	49	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	49	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	50	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	51	1		ug/L	1	526-73-8	1
n-Butylbenzene	48	1		ug/L	1	104-51-8	1
Hexachloroethane	46	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	52	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	48	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	47	5		ug/L	1	87-61-6	1
Naphthalene	54	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	57	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Lab Sample ID: S15872.06
Sample Tag: VAP-OS-MB263_5-10 MSD
Collected Date/Time: 07/21/2020 13:37
Matrix: Groundwater
COC Reference: 135816

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	20.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/23/20 13:15	JLS	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 21:25, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	59	10		ug/L	1	60-29-7	1
Acetone	60	50		ug/L	1	67-64-1	1
Methyl iodide	60	1		ug/L	1	74-88-4	1
Carbon disulfide	59	5		ug/L	1	75-15-0	1
tert-Methyl butyl ether (MTBE)	63	5		ug/L	1	1634-04-4	1
Acrylonitrile	62	2		ug/L	1	107-13-1	1
2-Butanone (MEK)	60	25		ug/L	1	78-93-3	1
Dichlorodifluoromethane	40	5		ug/L	1	75-71-8	1
Chloromethane	51	5		ug/L	1	74-87-3	1
Vinyl chloride	54	1		ug/L	1	75-01-4	1
Bromomethane	54	5		ug/L	1	74-83-9	1
Chloroethane	57	5		ug/L	1	75-00-3	1
Trichlorofluoromethane	58	1		ug/L	1	75-69-4	1
1,1-Dichloroethene	60	1		ug/L	1	75-35-4	1
Methylene chloride	58	5		ug/L	1	75-09-2	1
trans-1,2-Dichloroethene	61	1		ug/L	1	156-60-5	1
1,1-Dichloroethane	62	1		ug/L	1	75-34-3	1
cis-1,2-Dichloroethene	62	1		ug/L	1	156-59-2	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Chloroform	63	1		ug/L	1	67-66-3	1
Bromochloromethane	62	1		ug/L	1	74-97-5	1
1,1,1-Trichloroethane	63	1		ug/L	1	71-55-6	1
4-Methyl-2-pentanone (MIBK)	63	50		ug/L	1	108-10-1	1
2-Hexanone	63	50		ug/L	1	591-78-6	1
Carbon tetrachloride	63	1		ug/L	1	56-23-5	1
Benzene	61	1		ug/L	1	71-43-2	1
1,2-Dichloroethane	60	1		ug/L	1	107-06-2	1
Trichloroethene	61	1		ug/L	1	79-01-6	1
1,2-Dichloropropane	63	1		ug/L	1	78-87-5	1
Bromodichloromethane	64	1		ug/L	1	75-27-4	1
Dibromomethane	60	5		ug/L	1	74-95-3	1
cis-1,3-Dichloropropene	63	1		ug/L	1	10061-01-5	1
Toluene	62	1		ug/L	1	108-88-3	1
trans-1,3-Dichloropropene	64	1		ug/L	1	10061-02-6	1
1,1,2-Trichloroethane	62	1		ug/L	1	79-00-5	1
Tetrachloroethene	58	1		ug/L	1	127-18-4	1

1-Spiked at 50ug/L

Lab Sample ID: S15872.06 (continued)
Sample Tag: VAP-OS-MB263_5-10 MSD

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 21:25, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,4-Dichloro-2-butene	58	1		ug/L	1	110-57-6	1
Dibromochloromethane	64	5		ug/L	1	124-48-1	1
1,2-Dibromoethane	61	1		ug/L	1	106-93-4	1
Chlorobenzene	61	1		ug/L	1	108-90-7	1
1,1,1,2-Tetrachloroethane	64	1		ug/L	1	630-20-6	1
Ethylbenzene	64	1		ug/L	1	100-41-4	1
p,m-Xylene*	127	2		ug/L	1		1
o-Xylene	65	1		ug/L	1	95-47-6	1
Styrene	65	1		ug/L	1	100-42-5	1
Isopropylbenzene	65	5		ug/L	1	98-82-8	1
Bromoform	63	1		ug/L	1	75-25-2	1
1,1,2,2-Tetrachloroethane	62	1		ug/L	1	79-34-5	1
1,2,3-Trichloropropane	61	1		ug/L	1	96-18-4	1
n-Propylbenzene	63	1		ug/L	1	103-65-1	1
Bromobenzene	61	1		ug/L	1	108-86-1	1
1,3,5-Trimethylbenzene	62	1		ug/L	1	108-67-8	1
tert-Butylbenzene	63	1		ug/L	1	98-06-6	1
1,2,4-Trimethylbenzene	62	1		ug/L	1	95-63-6	1
sec-Butylbenzene	65	1		ug/L	1	135-98-8	1
p-Isopropyltoluene	66	5		ug/L	1	99-87-6	1
1,3-Dichlorobenzene	64	1		ug/L	1	541-73-1	1
1,4-Dichlorobenzene	63	1		ug/L	1	106-46-7	1
1,2-Dichlorobenzene	64	1		ug/L	1	95-50-1	1
1,2,3-Trimethylbenzene	65	1		ug/L	1	526-73-8	1
n-Butylbenzene	62	1		ug/L	1	104-51-8	1
Hexachloroethane	64	5		ug/L	1	67-72-1	1
1,2-Dibromo-3-chloropropane	66	5		ug/L	1	96-12-8	1
1,2,4-Trichlorobenzene	61	5		ug/L	1	120-82-1	1
1,2,3-Trichlorobenzene	59	5		ug/L	1	87-61-6	1
Naphthalene	68	5		ug/L	1	91-20-3	1
2-Methylnaphthalene	70	5		ug/L	1	91-57-6	1

1-Spiked at 50ug/L

Lab Sample ID: S15872.07
Sample Tag: Trip Blank
Collected Date/Time: 07/21/2020 00:01
Matrix: Water
COC Reference: 135816

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	20.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/23/20 13:15	JLS	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 14:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S15872.07 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/22/20 14:04, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Merit Laboratories Login Checklist

Lab Set ID: S15872
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing
Submitted: 07/21/2020 15:47 Login User: MMC

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	☐ Yes	☒ No	☐ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 20.2
02.	☒ Yes	☐ No	☐ N/A	Received on ice/ cooling process begun	
03.	☐ Yes	☒ No	☐ N/A	Samples shipped	
04.	☐ Yes	☒ No	☐ N/A	Samples left in 24 hr. drop box	
05.	☐ Yes	☐ No	☒ N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	☒ Yes	☐ No	☐ N/A	COC adequately filled out	
07.	☒ Yes	☐ No	☐ N/A	COC signed and relinquished to the lab	
08.	☒ Yes	☐ No	☐ N/A	Sample tag on bottles match COC	
09.	☐ Yes	☒ No	☐ N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	☒ Yes	☐ No	☐ N/A	Do sample have correct chemical preservation	
11.	☐ Yes	☐ No	☒ N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	☐ Yes	☒ No	☐ N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	☒ Yes	☐ No	☐ N/A	All bottles intact	
14.	☒ Yes	☐ No	☐ N/A	Appropriate analytical bottles are used	
15.	☒ Yes	☐ No	☐ N/A	Merit bottles used	
16.	☒ Yes	☐ No	☐ N/A	Sufficient sample volume received	
17.	☐ Yes	☒ No	☐ N/A	Samples require laboratory filtration	
18.	☒ Yes	☐ No	☐ N/A	Samples submitted within holding time	
19.	☐ Yes	☐ No	☒ N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

135816

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. #500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☐ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kara Donahue

TURNAROUND TIME REQUIRED ☐ 1 DAY ☒ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM5030C 8260C	Special Instructions
15872.01	7/21/20	12:42	VAP-OS-LV263	GW	3		3						X	
.02	7/21/20	13:03	VAP-OS-LY263	GW	3		3						X	
.03			DUP-01	GW	3		3						X	
.04/.05/.06	7/21/20	13:37	VAP-OS-MB263	GW	9		9						X	3 for MS and 3 for MSD
.07	7/21/20		Trip Blank		1								X	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Kara Donahue/Arcadis ☒ Sampler	DATE: 7/21/20	TIME: 1547	
RECEIVED BY: SIGNATURE/ORGANIZATION: M Gilcrease	DATE: 7/21/2020	TIME: 1547	
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	

RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	
SEAL NO.:	SEAL INTACT YES ☐ NO ☐	INITIALS:	NOTES: TEMP. ON ARRIVAL: 20.2
SEAL NO.:	SEAL INTACT YES ☐ NO ☐	INITIALS:	

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S16026.01(01)
Generated on 07/28/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Trevor Swarthout, Marina Samp

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S16026.01-S16026.03
Project: RACER Lansing
Collected Date(s): 07/24/2020
Submitted Date/Time: 07/24/2020 19:00
Sampled by: Kara Donahue
P.O. #: 30042872.04600

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003

Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S16026.01	VAP-OS-MA266_7-12	Groundwater	07/24/20 11:53
S16026.02	VAP-OS-MC268_7-12	Groundwater	07/24/20 13:15
S16026.03	Trip Blank	Water	07/24/20 00:01

Analytical Laboratory Report

Lab Sample ID: S16026.01
Sample Tag: VAP-OS-MA266_7-12
Collected Date/Time: 07/24/2020 11:53
Matrix: Groundwater
COC Reference: 135926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	18.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/28/20 09:36	JLS	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/28/20 00:56, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	1	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	1	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S16026.01 (continued)
Sample Tag: VAP-OS-MA266_7-12

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/28/20 00:56, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S16026.02
Sample Tag: VAP-OS-MC268_7-12
Collected Date/Time: 07/24/2020 13:15
Matrix: Groundwater
COC Reference: 135926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	18.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/28/20 09:36	JLS	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/28/20 01:15, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S16026.02 (continued)
Sample Tag: VAP-OS-MC268_7-12

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/28/20 01:15, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S16026.03
Sample Tag: Trip Blank
Collected Date/Time: 07/24/2020 00:01
Matrix: Water
COC Reference: 135926

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	18.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	07/28/20 09:36	JLS	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/27/20 22:01, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S16026.03 (continued)
Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 07/27/20 22:01, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Merit Laboratories Login Checklist

Lab Set ID: S16026
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: RACER Lansing
Submitted: 07/24/2020 19:00 Login User: REJ

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	☐ Yes	☒ No	☐ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 18.0
02.	☒ Yes	☐ No	☐ N/A	Received on ice/ cooling process begun	
03.	☐ Yes	☒ No	☐ N/A	Samples shipped	
04.	☒ Yes	☐ No	☐ N/A	Samples left in 24 hr. drop box	
05.	☐ Yes	☐ No	☒ N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	☒ Yes	☐ No	☐ N/A	COC adequately filled out	
07.	☒ Yes	☐ No	☐ N/A	COC signed and relinquished to the lab	
08.	☒ Yes	☐ No	☐ N/A	Sample tag on bottles match COC	
09.	☐ Yes	☒ No	☐ N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	☒ Yes	☐ No	☐ N/A	Do sample have correct chemical preservation	
11.	☐ Yes	☐ No	☒ N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	☐ Yes	☒ No	☐ N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	☒ Yes	☐ No	☐ N/A	All bottles intact	
14.	☒ Yes	☐ No	☐ N/A	Appropriate analytical bottles are used	
15.	☒ Yes	☐ No	☐ N/A	Merit bottles used	
16.	☒ Yes	☐ No	☐ N/A	Sufficient sample volume received	
17.	☐ Yes	☒ No	☐ N/A	Samples require laboratory filtration	
18.	☒ Yes	☐ No	☐ N/A	Samples submitted within holding time	
19.	☐ Yes	☒ No	☐ N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

135926

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr., Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 810-225-1929 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☐ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Kara Donahue

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs SM6200B JJ
1602601	7/24/20	11:53	VAP-OS-MA266_7-12	GW	3		X						X
-02	7/24/20	13:15	VAP-OS-MC268_8-13	GW	3		X						X
-03	7/24/20	—	Trip Blank	L	1								X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Kara Donahue	☒ Sampler	DATE: 7/24/20	TIME: 18:20
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Lab		DATE: 7/24/20	TIME: 18:20
RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit		DATE: 7/24/20	TIME: 1900
RECEIVED BY: SIGNATURE/ORGANIZATION: [illegible]		DATE: 7/24/20	TIME: 1900

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL: 18.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA78356

Sampling Date: 08/31/20

Report to:

Arcadis
300 S Washington Sq Suite 315
Lansing, MI 48933
marina.samp@arcadis.com; alex.villhauer@arcadis.com;
kaitlyn.voet@arcadis.com; tiffany.linder@arcadis.com
ATTN: Alex Villhauer

Total number of pages in report: 39

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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how we can serve you better at:
EHS.US.CustomerCare@sgs.com

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA78356

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA78356-1	08/31/20	10:25	AW	09/01/20	AQ	Ground Water	MW-12-12_083120
FA78356-2	08/31/20	11:35	AW	09/01/20	AQ	Ground Water	MW-14-70_083120
FA78356-3	08/31/20	12:25	AW	09/01/20	AQ	Ground Water	MW-12-13_083120
FA78356-4	08/31/20	13:20	AW	09/01/20	AQ	Ground Water	MW-14-67_083120
FA78356-5	08/31/20	14:20	AW	09/01/20	AQ	Ground Water	MW-13-36R_083120
FA78356-6	08/31/20	00:00	AW	09/01/20	AQ	Ground Water	DUP-02_083120
FA78356-7	08/31/20	13:30	AW	09/01/20	AQ	Ground Water	P6-SB-07_083120
FA78356-8	08/31/20	17:35	AW	09/01/20	AQ	Equipment Blank	EB-02_083120

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Summary of Hits

Job Number: FA78356
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 08/31/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA78356-1	**MW-12-12_083120**					
Perfluorobutanoic acid		0.0483	0.0037	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0891	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.121	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0698	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.117	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0115	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0181	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0012 J	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0017 J	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0675	0.0019	0.00093	ug/l	EPA 537M BY ID
FA78356-2	**MW-14-70_083120**					
Perfluorobutanoic acid		0.134	0.0037	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.449	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.298	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.101	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0066	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0036	0.0019	0.00093	ug/l	EPA 537M BY ID
FA78356-3	**MW-12-13_083120**					
Perfluorobutanoic acid		0.0317	0.0037	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0386	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0612	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0178	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0019	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0021	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.00095 J	0.0019	0.00093	ug/l	EPA 537M BY ID
FA78356-4	**MW-14-67_083120**					
Perfluorobutanoic acid		0.0511	0.0037	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0717	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0869	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0320	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0110	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0018 J	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0017 J	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0025	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0043	0.0019	0.00093	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA78356
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 08/31/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA78356-5	**MW-13-36R_083120**					
Perfluorobutanoic acid [a]		0.0227	0.0037	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid [a]		0.0248	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanoic acid [a]		0.0274	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid [a]		0.0288	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid [a]		0.0628	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorononanoic acid [a]		0.0117	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorodecanoic acid [a]		0.0221	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid [a]		0.0022	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid [a]		0.0527	0.0019	0.00093	ug/l	EPA 537M BY ID
MeFOSAA [a]		0.0051	0.0037	0.0019	ug/l	EPA 537M BY ID
EtFOSAA [a]		0.0085	0.0037	0.0019	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate [a]		0.0046 J	0.0074	0.0019	ug/l	EPA 537M BY ID
FA78356-6	**DUP-02_083120**					
Perfluorobutanoic acid [a]		0.0249	0.0038	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid [a]		0.0208	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorohexanoic acid [a]		0.0262	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid [a]		0.0276	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanoic acid [a]		0.0602	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorononanoic acid [a]		0.0114	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorodecanoic acid [a]		0.0214	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid [a]		0.0023	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid [a]		0.0544	0.0019	0.00096	ug/l	EPA 537M BY ID
MeFOSAA [a]		0.0041	0.0038	0.0019	ug/l	EPA 537M BY ID
EtFOSAA [a]		0.0076	0.0038	0.0019	ug/l	EPA 537M BY ID
FA78356-7	**P6-SB-07_083120**					
Perfluorobutanoic acid		0.338	0.0037	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		1.23	0.0093	0.0046	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		1.32	0.0093	0.0046	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		1.17	0.0093	0.0046	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		1.59	0.0093	0.0046	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.154	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0405	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0083	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0028	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0049	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0019	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0904	0.0019	0.00093	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA78356
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 08/31/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

FA78356-8 **EB-02_083120**

No hits reported in this sample.

(a) Confirmed by sample duplicate.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-12-12_083120		
Lab Sample ID:	FA78356-1	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54277.D	1	09/17/20 18:39	NAF	09/15/20 12:30	OP82024	S2Q807
Run #2 [a]	2Q54340.D	5	09/18/20 15:43	NAF	09/15/20 12:30	OP82024	S2Q808

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2	270 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0483	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0891	0.0019	0.00093	ug/l	
307-24-4	Perfluorohexanoic acid	0.121	0.0019	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0698	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.117	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	0.0115	0.0019	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	0.0181	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0012	0.0019	0.00093	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0017	0.0019	0.00093	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0675	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.019	0.0093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0037	0.0019	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-12_083120		
Lab Sample ID:	FA78356-1	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0093	0.0037	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	73%	88%	35-135%
	13C5-PFPeA	75%	88%	50-150%
	13C5-PFHxA	68%	83%	50-150%
	13C4-PFHpA	62%	74%	50-150%
	13C8-PFOA	71%	83%	50-150%
	13C9-PFNA	74%	81%	50-150%
	13C6-PFDA	72%	79%	50-150%
	13C7-PFUnDA	74%	80%	40-140%
	13C2-PFDoDA	78%	84%	40-140%
	13C2-PFTeDA	79%	79%	30-130%
	13C3-PFBS	80%	88%	50-150%
	13C3-PFHxS	77%	85%	50-150%
	13C8-PFOS	78%	88%	50-150%
	13C8-FOSA	20% [c]	39%	30-130%
	d3-MeFOSAA	87%	110%	50-150%
	13C2-4:2FTS	66%	81%	50-150%
	13C2-6:2FTS	71%	81%	50-150%
	13C2-8:2FTS	76%	78%	50-150%
	13C3-HFPO-DA	70%	89%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-70_083120		
Lab Sample ID:	FA78356-2	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54278.D	1	09/17/20 18:54	NAF	09/15/20 12:30	OP82024	S2Q807
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.134	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.449	0.0019	0.00093	ug/l	
307-24-4	Perfluorohexanoic acid	0.298	0.0019	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	0.101	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0066	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0036	0.0019	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.0019	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0037	0.0019	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-70_083120		
Lab Sample ID:	FA78356-2	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0093	0.0037	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	81%		50-150%
	13C5-PFHxA	79%		50-150%
	13C4-PFHpA	74%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	92%		50-150%
	13C6-PFDA	94%		50-150%
	13C7-PFUnDA	89%		40-140%
	13C2-PFDoDA	87%		40-140%
	13C2-PFTeDA	86%		30-130%
	13C3-PFBS	81%		50-150%
	13C3-PFHxS	81%		50-150%
	13C8-PFOS	92%		50-150%
	13C8-FOSA	90%		30-130%
	d3-MeFOSAA	100%		50-150%
	13C2-4:2FTS	74%		50-150%
	13C2-6:2FTS	84%		50-150%
	13C2-8:2FTS	82%		50-150%
	13C3-HFPO-DA	78%		50-150%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-13_083120		
Lab Sample ID:	FA78356-3	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54280.D	1	09/17/20 19:23	NAF	09/15/20 12:30	OP82024	S2Q807
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0317	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0386	0.0019	0.00093	ug/l	
307-24-4	Perfluorohexanoic acid	0.0612	0.0019	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0178	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0019	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0021	0.0019	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.00095	0.0019	0.00093	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.0019	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0037	0.0019	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-13_083120		
Lab Sample ID:	FA78356-3	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0093	0.0037	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	84%		35-135%
	13C5-PFPeA	87%		50-150%
	13C5-PFHxA	83%		50-150%
	13C4-PFHpA	78%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	94%		50-150%
	13C6-PFDA	98%		50-150%
	13C7-PFUnDA	97%		40-140%
	13C2-PFDoDA	95%		40-140%
	13C2-PFTeDA	89%		30-130%
	13C3-PFBS	87%		50-150%
	13C3-PFHxS	86%		50-150%
	13C8-PFOS	91%		50-150%
	13C8-FOSA	84%		30-130%
	d3-MeFOSAA	109%		50-150%
	13C2-4:2FTS	80%		50-150%
	13C2-6:2FTS	88%		50-150%
	13C2-8:2FTS	89%		50-150%
	13C3-HFPO-DA	80%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-67_083120		
Lab Sample ID:	FA78356-4	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54281.D	1	09/17/20 19:38	NAF	09/15/20 12:30	OP82024	S2Q807
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0511	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0717	0.0019	0.00093	ug/l	
307-24-4	Perfluorohexanoic acid	0.0869	0.0019	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0320	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0110	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	0.0018	0.0019	0.00093	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0017	0.0019	0.00093	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0025	0.0019	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0043	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.0019	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0037	0.0019	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-67_083120		
Lab Sample ID:	FA78356-4	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0093	0.0037	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	60%		35-135%
	13C5-PFPeA	63%		50-150%
	13C5-PFHxA	60%		50-150%
	13C4-PFHpA	58%		50-150%
	13C8-PFOA	74%		50-150%
	13C9-PFNA	78%		50-150%
	13C6-PFDA	80%		50-150%
	13C7-PFUnDA	89%		40-140%
	13C2-PFDoDA	88%		40-140%
	13C2-PFTeDA	62%		30-130%
	13C3-PFBS	71%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	80%		50-150%
	13C8-FOSA	38%		30-130%
	d3-MeFOSAA	113%		50-150%
	13C2-4:2FTS	56%		50-150%
	13C2-6:2FTS	72%		50-150%
	13C2-8:2FTS	80%		50-150%
	13C3-HFPO-DA	63%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-13-36R_083120		
Lab Sample ID:	FA78356-5	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	2Q54282.D	1	09/17/20 19:53	NAF	09/15/20 12:30	OP82024	S2Q807
Run #2 [b]	2Q54341.D	5	09/18/20 15:57	NAF	09/15/20 12:30	OP82024	S2Q808

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2	270 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0227	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0248	0.0019	0.00093	ug/l	
307-24-4	Perfluorohexanoic acid	0.0274	0.0019	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0288	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0628	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	0.0117	0.0019	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	0.0221	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND [c]	0.0093	0.0046	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND [c]	0.0093	0.0046	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0022	0.0019	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0527	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA [d]	ND [c]	0.019	0.0093	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	0.0051	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	0.0085	0.0037	0.0019	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0046	0.0074	0.0019	ug/l	J

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-13-36R_083120		
Lab Sample ID:	FA78356-5	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0093	0.0037	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	74%	85%	35-135%
	13C5-PFPeA	78%	87%	50-150%
	13C5-PFHxA	72%	83%	50-150%
	13C4-PFHpA	66%	75%	50-150%
	13C8-PFOA	75%	85%	50-150%
	13C9-PFNA	73%	79%	50-150%
	13C6-PFDA	67%	73%	50-150%
	13C7-PFUnDA	60%	72%	40-140%
	13C2-PFDoDA	54%	66%	40-140%
	13C2-PFTeDA	27% [e]	34%	30-130%
	13C3-PFBS	79%	84%	50-150%
	13C3-PFHxS	77%	84%	50-150%
	13C8-PFOS	75%	79%	50-150%
	13C8-FOSA	13% [e]	25% [e]	30-130%
	d3-MeFOSAA	65%	85%	50-150%
	13C2-4:2FTS	65%	79%	50-150%
	13C2-6:2FTS	74%	81%	50-150%
	13C2-8:2FTS	73%	75%	50-150%
	13C3-HFPO-DA	72%	83%	50-150%

(a) Confirmed by sample duplicate.
(b) Dilution required due to matrix interference (ID recovery standard failure).
(c) Result is from Run# 2
(d) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(e) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-02_083120		
Lab Sample ID:	FA78356-6	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	2Q54283.D	1	09/17/20 20:07	NAF	09/15/20 12:30	OP82024	S2Q807
Run #2 [b]	2Q54342.D	5	09/18/20 16:12	NAF	09/15/20 12:30	OP82024	S2Q808

	Initial Volume	Final Volume
Run #1	260 ml	1.0 ml
Run #2	260 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0249	0.0038	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0208	0.0019	0.00096	ug/l	
307-24-4	Perfluorohexanoic acid	0.0262	0.0019	0.00096	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0276	0.0019	0.00096	ug/l	
335-67-1	Perfluorooctanoic acid	0.0602	0.0019	0.00096	ug/l	
375-95-1	Perfluorononanoic acid	0.0114	0.0019	0.00096	ug/l	
335-76-2	Perfluorodecanoic acid	0.0214	0.0019	0.00096	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00096	ug/l	
307-55-1	Perfluorododecanoic acid	ND [c]	0.0096	0.0048	ug/l	
72629-94-8	Perfluorotridecanoic acid [d]	ND [c]	0.0096	0.0048	ug/l	
376-06-7	Perfluorotetradecanoic acid [d]	ND [c]	0.0096	0.0048	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0023	0.0019	0.00096	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00096	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00096	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00096	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0544	0.0019	0.00096	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00096	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00096	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [c]	0.019	0.0096	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	0.0041	0.0038	0.0019	ug/l	
2991-50-6	EtFOSAA	0.0076	0.0038	0.0019	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-02_083120		
Lab Sample ID:	FA78356-6	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0096	0.0038	ug/l	
919005-14-4	ADONA	ND	0.0077	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0077	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0077	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	76%	88%	35-135%
	13C5-PFPeA	80%	91%	50-150%
	13C5-PFHxA	74%	88%	50-150%
	13C4-PFHpA	68%	79%	50-150%
	13C8-PFOA	76%	89%	50-150%
	13C9-PFNA	73%	80%	50-150%
	13C6-PFDA	63%	71%	50-150%
	13C7-PFUnDA	52%	64%	40-140%
	13C2-PFDoDA	36% [e]	47%	40-140%
	13C2-PFTeDA	9% [e]	7% [e]	30-130%
	13C3-PFBS	81%	88%	50-150%
	13C3-PFHxS	80%	86%	50-150%
	13C8-PFOS	73%	82%	50-150%
	13C8-FOSA	15% [e]	30%	30-130%
	d3-MeFOSAA	63%	78%	50-150%
	13C2-4:2FTS	66%	85%	50-150%
	13C2-6:2FTS	75%	86%	50-150%
	13C2-8:2FTS	69%	75%	50-150%
	13C3-HFPO-DA	75%	90%	50-150%

(a) Confirmed by sample duplicate.
(b) Dilution required due to matrix interference (ID recovery standard failure).
(c) Result is from Run# 2
(d) Associated ID Standard outside control limits due to matrix interference. Confirmed by reanalysis.
(e) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-SB-07_083120		
Lab Sample ID:	FA78356-7	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54284.D	1	09/17/20 20:22	NAF	09/15/20 12:30	OP82024	S2Q807
Run #2	2Q54343.D	5	09/18/20 16:27	NAF	09/15/20 12:30	OP82024	S2Q808

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2	270 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.338	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	1.23 [a]	0.0093	0.0046	ug/l	
307-24-4	Perfluorohexanoic acid	1.32 [a]	0.0093	0.0046	ug/l	
375-85-9	Perfluoroheptanoic acid	1.17 [a]	0.0093	0.0046	ug/l	
335-67-1	Perfluorooctanoic acid	1.59 [a]	0.0093	0.0046	ug/l	
375-95-1	Perfluorononanoic acid	0.154	0.0019	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	0.0405	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0083	0.0019	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0028	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0049	0.0019	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0019	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0904	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.0019	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0037	0.0019	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-SB-07_083120		
Lab Sample ID:	FA78356-7	**Date Sampled:**	08/31/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0093	0.0037	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	76%	89%	35-135%
	13C5-PFPeA	76%	92%	50-150%
	13C5-PFHxA	68%	86%	50-150%
	13C4-PFHpA	63%	78%	50-150%
	13C8-PFOA	69%	88%	50-150%
	13C9-PFNA	77%	89%	50-150%
	13C6-PFDA	77%	85%	50-150%
	13C7-PFUnDA	78%	88%	40-140%
	13C2-PFDoDA	80%	87%	40-140%
	13C2-PFTeDA	74%	83%	30-130%
	13C3-PFBS	83%	90%	50-150%
	13C3-PFHxS	83%	92%	50-150%
	13C8-PFOS	79%	84%	50-150%
	13C8-FOSA	35%	68%	30-130%
	d3-MeFOSAA	100%	111%	50-150%
	13C2-4:2FTS	71%	85%	50-150%
	13C2-6:2FTS	67%	87%	50-150%
	13C2-8:2FTS	79%	83%	50-150%
	13C3-HFPO-DA	74%	87%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-02_083120		
Lab Sample ID:	FA78356-8	**Date Sampled:**	08/31/20
Matrix:	AQ - Equipment Blank	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54285.D	1	09/17/20 20:37	NAF	09/15/20 12:30	OP82024	S2Q807
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0019	0.00093	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0019	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0019	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.0019	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0037	0.0019	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-02_083120		
Lab Sample ID:	FA78356-8	**Date Sampled:**	08/31/20
Matrix:	AQ - Equipment Blank	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0093	0.0037	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	96%		35-135%
	13C5-PFPeA	99%		50-150%
	13C5-PFHxA	98%		50-150%
	13C4-PFHpA	94%		50-150%
	13C8-PFOA	97%		50-150%
	13C9-PFNA	90%		50-150%
	13C6-PFDA	89%		50-150%
	13C7-PFUnDA	85%		40-140%
	13C2-PFDoDA	84%		40-140%
	13C2-PFTeDA	66%		30-130%
	13C3-PFBS	96%		50-150%
	13C3-PFHxS	98%		50-150%
	13C8-PFOS	88%		50-150%
	13C8-FOSA	86%		30-130%
	d3-MeFOSAA	93%		50-150%
	13C2-4:2FTS	89%		50-150%
	13C2-6:2FTS	87%		50-150%
	13C2-8:2FTS	79%		50-150%
	13C3-HFPO-DA	90%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

SGS North America Inc - Orlando
Chain of Custody

SGS

Plant 6

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL: 407-425-6700 FAX: 407-425-0707
www.sgs.com

FA78356
SGS - ORLANDO JOB #: PAGE 1 OF 1

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Tiffany.Linder@arcadis.com Email:
Phone #: 810-225-1928
Sampler(s) Name(s) (Printed)
Sampler 1: Austin Westhuis Sampler 2:

Project Information

Project Name: RACER Lansing
Street: 2800 W. Saginaw Street
City: Lansing State: MI
Project #: 30042872.03700
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via method 537 mod. w/ isotope dilution per QSM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	MeOH/ENCORE	DI WATER	MEOH	PFAS via method 537 mod. w/ isotope dilution per QSM 5.1	LAB USE ONLY
1	MW-12-12_083120	8/31/20	1025	aw	GW	2		2								X	
2	MW-14-70_083120	8/31/20	1135	aw	GW	2		2								X	
3	MW-12-13_083120	8/31/20	1225	aw	GW	2		2								X	
4	MW-14-67_083120	8/31/20	1320	aw	GW	2		2								X	
5	MW-13-36R_083120	8/31/20	1420	aw	GW	2		2								X	
6	Dup-02_083120	8/31/20	—	aw	GW	2		2								X	
7	P6-SB-07_083120	8/31/20	1330	aw	GW	2		2								X	
8	EB-02_083120	8/31/20	1735	aw	GW	2		2								X	

INITIAL ASSESSMENT DD
LABEL VERIFICATION DD

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

- Report EGLE 28 compounds

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1	Arcadis	8/31/20	2 FedEx	3 FX		4 09/01/20 10:15
5	Relinquished by/Affiliation	Date Time:	Received By/Affiliation 6	Relinquished By/Affiliation 7	Date Time:	Received By/Affiliation 8

Lab Use Only: Cooler Temperature (s) Celsius (corrected): 4.2

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA78356: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA78356 **Client:** ARCADIS **Project:** RACER LANSING

Date / Time Received: 9/1/2020 10:15:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 138666018134

Therm ID: IR 1; **Therm CF:** -0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (4.4);

Cooler Temps (Corrected) °C: Cooler 1: (4.2);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: JENNAK Date: 9/1/2020 10:15:00 AM Reviewer: _____ Date: _____

FA78356: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82024-MB	2Q54265.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78356-1, FA78356-2, FA78356-3, FA78356-4, FA78356-5, FA78356-6, FA78356-7, FA78356-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.010	0.0040	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	92%	35-135%
	13C5-PFPeA	95%	50-150%
	13C5-PFHxA	96%	50-150%
	13C4-PFHpA	92%	50-150%

Method Blank Summary

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82024-MB	2Q54265.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78356-1, FA78356-2, FA78356-3, FA78356-4, FA78356-5, FA78356-6, FA78356-7, FA78356-8

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	100%	50-150%
	13C9-PFNA	94%	50-150%
	13C6-PFDA	93%	50-150%
	13C7-PFUnDA	88%	40-140%
	13C2-PFDoDA	82%	40-140%
	13C2-PFTeDA	81%	30-130%
	13C3-PFBS	94%	50-150%
	13C3-PFHxS	95%	50-150%
	13C8-PFOS	94%	50-150%
	13C8-FOSA	91%	30-130%
	d3-MeFOSAA	97%	50-150%
	13C2-4:2FTS	88%	50-150%
	13C2-6:2FTS	84%	50-150%
	13C2-8:2FTS	81%	50-150%
	13C3-HFPO-DA	94%	50-150%

Instrument Blank

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q807-IBLK	2Q54232.D	1	09/17/20	NAF	n/a	n/a	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA78356-1, FA78356-2, FA78356-3, FA78356-4, FA78356-5, FA78356-6, FA78356-7, FA78356-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.020	0.0050	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	93%	50-150%
	13C4-PFHpA	93%	50-150%
	13C8-PFOA	93%	50-150%
	13C9-PFNA	88%	50-150%

Instrument Blank

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q807-IBLK	2Q54232.D	1	09/17/20	NAF	n/a	n/a	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA78356-1, FA78356-2, FA78356-3, FA78356-4, FA78356-5, FA78356-6, FA78356-7, FA78356-8

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	92%	50-150%
	13C7-PFUnDA	92%	50-150%
	13C2-PFDoDA	86%	50-150%
	13C2-PFTeDA	82%	50-150%
	13C3-PFBS	95%	50-150%
	13C3-PFHxS	93%	50-150%
	13C8-PFOS	94%	50-150%
	d3-MeFOSAA	92%	50-150%
	13C3-HFPO-DA	101%	50-150%

Instrument Blank

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q808-IBLK	2Q54314.D	1	09/18/20	NAF	n/a	n/a	S2Q808

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA78356-1, FA78356-5, FA78356-6, FA78356-7

CAS No.	Compound	Result	RL	MDL	Units	Q
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	94%	50-150%
	13C4-PFHpA	94%	50-150%
	13C8-PFOA	99%	50-150%
	13C9-PFNA	94%	50-150%
	13C6-PFDA	98%	50-150%
	13C7-PFUnDA	95%	50-150%
	13C2-PFDoDA	93%	50-150%
	13C2-PFTeDA	91%	50-150%
	13C3-PFBS	95%	50-150%
	13C3-PFHxS	96%	50-150%
	13C8-PFOS	100%	50-150%
	d3-MeFOSAA	104%	50-150%
	13C3-HFPO-DA	101%	50-150%

Blank Spike Summary

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82024-BS	2Q54264.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78356-1, FA78356-2, FA78356-3, FA78356-4, FA78356-5, FA78356-6, FA78356-7, FA78356-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0770	96	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0722	90	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0768	96	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0815	102	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0763	95	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0743	93	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0745	93	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0768	96	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0752	94	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0779	97	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0757	95	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0758	95	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0749	94	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0704	88	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0828	104	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0755	94	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0748	94	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0753	94	60-130
754-91-6	PFOSA	0.08	0.0767	96	70-130
2355-31-9	MeFOSAA	0.08	0.0761	95	70-130
2991-50-6	EtFOSAA	0.08	0.0775	97	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0773	97	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0815	102	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0777	97	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0741	93	60-140
919005-14-4	ADONA	0.08	0.0741	93	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0712	89	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0717	90	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	90%	35-135%
	13C5-PFPeA	94%	50-150%
	13C5-PFHxA	93%	50-150%
	13C4-PFHpA	88%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82024-BS	2Q54264.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78356-1, FA78356-2, FA78356-3, FA78356-4, FA78356-5, FA78356-6, FA78356-7, FA78356-8

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	96%	50-150%
	13C9-PFNA	92%	50-150%
	13C6-PFDA	91%	50-150%
	13C7-PFUnDA	86%	40-140%
	13C2-PFDoDA	82%	40-140%
	13C2-PFTeDA	80%	30-130%
	13C3-PFBS	90%	50-150%
	13C3-PFHxS	95%	50-150%
	13C8-PFOS	92%	50-150%
	13C8-FOSA	89%	30-130%
	d3-MeFOSAA	96%	50-150%
	13C2-4:2FTS	91%	50-150%
	13C2-6:2FTS	86%	50-150%
	13C2-8:2FTS	83%	50-150%
	13C3-HFPO-DA	92%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82024-MS	2Q54269.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807
FA78355-3	2Q54268.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78356-1, FA78356-2, FA78356-3, FA78356-4, FA78356-5, FA78356-6, FA78356-7, FA78356-8

CAS No.	Compound	FA78355-3 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	ND		0.0741	0.0697	94	70-130
2706-90-3	Perfluoropentanoic acid	ND		0.0741	0.0643	87	70-130
307-24-4	Perfluorohexanoic acid	ND		0.0741	0.0686	93	70-130
375-85-9	Perfluoroheptanoic acid	ND		0.0741	0.0719	97	70-130
335-67-1	Perfluorooctanoic acid	ND		0.0741	0.0692	93	70-130
375-95-1	Perfluorononanoic acid	ND		0.0741	0.0657	89	70-130
335-76-2	Perfluorodecanoic acid	ND		0.0741	0.0674	91	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.0741	0.0696	94	70-130
307-55-1	Perfluorododecanoic acid	ND		0.0741	0.0676	91	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.0741	0.0691	93	65-130
376-06-7	Perfluorotetradecanoic acid	ND		0.0741	0.0671	91	70-130
375-73-5	Perfluorobutanesulfonic acid	ND		0.0741	0.0666	90	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0741	0.0672	91	70-130
355-46-4	Perfluorohexanesulfonic acid	ND		0.0741	0.0642	87	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0741	0.0754	102	70-130
1763-23-1	Perfluorooctanesulfonic acid	ND		0.0741	0.0679	92	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0741	0.0705	95	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0741	0.0744	100	60-130
754-91-6	PFOSA	ND		0.0741	0.0682	92	70-130
2355-31-9	MeFOSAA	ND		0.0741	0.0687	93	70-130
2991-50-6	EtFOSAA	ND		0.0741	0.0712	96	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0741	0.0705	95	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0741	0.0759	102	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0741	0.0719	97	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.0741	0.0676	91	60-140
919005-14-4	ADONA	ND		0.0741	0.0663	90	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.0741	0.0606	82	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		0.0741	0.0671	91	60-140

CAS No.	ID Standard Recoveries	MS	FA78355-3	Limits
	13C4-PFBA	96%	95%	35-135%
	13C5-PFPeA	100%	100%	50-150%
	13C5-PFHxA	100%	100%	50-150%
	13C4-PFHpA	96%	96%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82024-MS	2Q54269.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807
FA78355-3	2Q54268.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78356-1, FA78356-2, FA78356-3, FA78356-4, FA78356-5, FA78356-6, FA78356-7, FA78356-8

CAS No.	ID Standard Recoveries	MS	FA78355-3	Limits
	13C8-PFOA	103%	103%	50-150%
	13C9-PFNA	99%	98%	50-150%
	13C6-PFDA	98%	99%	50-150%
	13C7-PFUnDA	96%	97%	40-140%
	13C2-PFDoDA	93%	88%	40-140%
	13C2-PFTeDA	88%	83%	30-130%
	13C3-PFBS	98%	99%	50-150%
	13C3-PFHxS	100%	102%	50-150%
	13C8-PFOS	99%	102%	50-150%
	13C8-FOSA	89%	89%	30-130%
	d3-MeFOSAA	106%	105%	50-150%
	13C2-4:2FTS	95%	91%	50-150%
	13C2-6:2FTS	93%	88%	50-150%
	13C2-8:2FTS	90%	87%	50-150%
	13C3-HFPO-DA	97%	93%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82024-DUP	2Q54279.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807
FA78356-2	2Q54278.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78356-1, FA78356-2, FA78356-3, FA78356-4, FA78356-5, FA78356-6, FA78356-7, FA78356-8

CAS No.	Compound	FA78356-2 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.134		0.128		5	30
2706-90-3	Perfluoropentanoic acid	0.449		0.428		5	30
307-24-4	Perfluorohexanoic acid	0.298		0.284		5	30
375-85-9	Perfluoroheptanoic acid	0.101		0.0953		6	30
335-67-1	Perfluorooctanoic acid	0.0066		0.0064		3	30
375-95-1	Perfluorononanoic acid	ND		ND		nc	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0036		0.0051		34*	30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0016	J	200*	30
355-46-4	Perfluorohexanesulfonic acid	ND		ND		nc	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	ND		ND		nc	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA78356-2	Limits
	13C4-PFBA	77%	78%	35-135%
	13C5-PFPeA	80%	81%	50-150%
	13C5-PFHxA	77%	79%	50-150%
	13C4-PFHpA	73%	74%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA78356
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82024-DUP	2Q54279.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807
FA78356-2	2Q54278.D	1	09/17/20	NAF	09/15/20	OP82024	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78356-1, FA78356-2, FA78356-3, FA78356-4, FA78356-5, FA78356-6, FA78356-7, FA78356-8

CAS No.	ID Standard Recoveries	DUP	FA78356-2	Limits
	13C8-PFOA	89%	90%	50-150%
	13C9-PFNA	90%	92%	50-150%
	13C6-PFDA	91%	94%	50-150%
	13C7-PFUnDA	86%	89%	40-140%
	13C2-PFDoDA	83%	87%	40-140%
	13C2-PFTeDA	81%	86%	30-130%
	13C3-PFBS	80%	81%	50-150%
	13C3-PFHxS	82%	81%	50-150%
	13C8-PFOS	87%	92%	50-150%
	13C8-FOSA	80%	90%	30-130%
	d3-MeFOSAA	90%	100%	50-150%
	13C2-4:2FTS	75%	74%	50-150%
	13C2-6:2FTS	82%	84%	50-150%
	13C2-8:2FTS	77%	82%	50-150%
	13C3-HFPO-DA	76%	78%	50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

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Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA78358

Sampling Dates: 08/27/20 - 08/28/20

Report to:

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Total number of pages in report: 52

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

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Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA78358

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA78358-1	08/27/20	09:05	AWBC	09/01/20	AQ	Ground Water	MW-18-98_082720
FA78358-2	08/27/20	10:00	AWBC	09/01/20	AQ	Ground Water	MW-18-99_082720
FA78358-3	08/27/20	13:05	AWBC	09/01/20	AQ	Ground Water	MW-18-89_082720
FA78358-4	08/27/20	11:50	AWBC	09/01/20	AQ	Ground Water	MW-18-90_082720
FA78358-5	08/27/20	12:50	AWBC	09/01/20	AQ	Ground Water	MW-18-88_082720
FA78358-6	08/27/20	13:55	AWBC	09/01/20	AQ	Ground Water	MW-18-91_082720
FA78358-7	08/27/20	15:05	AWBC	09/01/20	AQ	Ground Water	UNK-15_082720
FA78358-8	08/27/20	15:30	AWBC	09/01/20	AQ	Equipment Blank	EB-01_082720
FA78358-9	08/28/20	10:25	AWBC	09/01/20	AQ	Ground Water	MW-18-105_082820
FA78358-10	08/28/20	12:10	AWBC	09/01/20	AQ	Ground Water	MW-18-103_082820
FA78358-10D	08/28/20	12:10	AWBC	09/01/20	AQ	Water Dup/MSD	MW-18-103_082820
FA78358-10S	08/28/20	12:10	AWBC	09/01/20	AQ	Water Matrix Spike	MW-18-103_082820

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Sample Summary
(continued)

Arcadis

Job No: FA78358

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA78358-11	08/28/20	13:45	AWBC	09/01/20	AQ	Ground Water	MW-18-95_082820
FA78358-12	08/28/20	00:00	AWBC	09/01/20	AQ	Ground Water	DUP-01_082820

Summary of Hits

Job Number: FA78358
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 08/27/20 thru 08/28/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA78358-1	**MW-18-98_082720**					
Perfluorobutanoic acid		0.0626	0.0034	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0248	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0287	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0125	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0263	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.00099 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0030	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0024	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0024	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.105	0.0017	0.00086	ug/l	EPA 537M BY ID
FA78358-2	**MW-18-99_082720**					
Perfluorobutanoic acid		0.0142	0.0034	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0054	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0042	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0042	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0086	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.00099 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0026	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0023	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0812	0.0017	0.00086	ug/l	EPA 537M BY ID
FA78358-3	**MW-18-89_082720**					
Perfluorobutanoic acid		0.0123	0.0034	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0082	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0080	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0052	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0150	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0012 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0017	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0010 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0051	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0042	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.170	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0010 J	0.0017	0.00086	ug/l	EPA 537M BY ID
FA78358-4	**MW-18-90_082720**					
Perfluorobutanoic acid [a]		0.0113	0.0034	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0049	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0074	0.0017	0.00086	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA78358
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 08/27/20 thru 08/28/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluoroheptanoic acid		0.0055	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0159	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0014 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0016 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0023	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0025	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0181	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0332	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		1.01	0.0086	0.0043	ug/l	EPA 537M BY ID
FA78358-5	**MW-18-88_082720**					
Perfluorobutanoic acid		0.0102	0.0034	0.0017	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0010 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0012 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0088	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0021	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0036	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0030	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.271	0.0017	0.00086	ug/l	EPA 537M BY ID
FA78358-6	**MW-18-91_082720**					
Perfluorobutanoic acid		0.0092	0.0034	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0047	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0039	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0043	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.010	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0014 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0012 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.00087 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0017	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0021	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0645	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0097	0.0017	0.00086	ug/l	EPA 537M BY ID
FA78358-7	**UNK-15_082720**					
Perfluorobutanoic acid		0.0171	0.0034	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0186	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0165	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0121	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0370	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0053	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0028	0.0017	0.00086	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA78358
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 08/27/20 thru 08/28/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorobutanesulfonic acid		0.0022	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0019	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0139	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0189	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		1.35	0.0086	0.0043	ug/l	EPA 537M BY ID
FA78358-8	**EB-01_082720**					
No hits reported in this sample.						
FA78358-9	**MW-18-105_082820**					
Perfluorobutanoic acid		0.0029 J	0.0034	0.0017	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0014 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0054	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0023	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0080	0.0017	0.00086	ug/l	EPA 537M BY ID
FA78358-10	**MW-18-103_082820**					
Perfluorobutanoic acid		0.0025 J	0.0034	0.0017	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0054	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0041	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0380	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0052	0.0017	0.00086	ug/l	EPA 537M BY ID
FA78358-11	**MW-18-95_082820**					
Perfluorobutanoic acid		0.0113	0.0034	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0011 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0013 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0010 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0063	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.00095 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0016 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0011 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.00097 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0466	0.0017	0.00086	ug/l	EPA 537M BY ID
FA78358-12	**DUP-01_082820**					
Perfluorobutanoic acid		0.0107	0.0034	0.0017	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0011 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.00093 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.00093 J	0.0017	0.00086	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA78358
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 08/27/20 thru 08/28/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorooctanoic acid		0.0056	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0018	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0015 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0012 J	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0491	0.0017	0.00086	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0011 J	0.0017	0.00086	ug/l	EPA 537M BY ID

(a) Associated ID Standard outside control limits, Confirmed by re-analysis.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-18-98_082720		
Lab Sample ID:	FA78358-1	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54218.D	1	09/16/20 16:08	NAF	09/15/20 08:30	OP82026	S2Q806
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0626	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0248	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	0.0287	0.0017	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0125	0.0017	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0263	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	0.00099	0.0017	0.00086	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0030	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0024	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0024	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.105	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-98_082720		
Lab Sample ID:	FA78358-1	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	81%		35-135%
	13C5-PFPeA	86%		50-150%
	13C5-PFHxA	82%		50-150%
	13C4-PFHpA	78%		50-150%
	13C8-PFOA	87%		50-150%
	13C9-PFNA	89%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	85%		40-140%
	13C2-PFDoDA	83%		40-140%
	13C2-PFTeDA	76%		30-130%
	13C3-PFBS	84%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	85%		50-150%
	13C8-FOSA	78%		30-130%
	d3-MeFOSAA	99%		50-150%
	13C2-4:2FTS	79%		50-150%
	13C2-6:2FTS	82%		50-150%
	13C2-8:2FTS	81%		50-150%
	13C3-HFPO-DA	77%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-99_082720		
Lab Sample ID:	FA78358-2	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54219.D	1	09/16/20 16:23	NAF	09/15/20 08:30	OP82026	S2Q806
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0142	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0054	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	0.0042	0.0017	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0042	0.0017	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0086	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	0.00099	0.0017	0.00086	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0026	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0023	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0812	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-99_082720		
Lab Sample ID:	FA78358-2	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	75%		35-135%
	13C5-PFPeA	79%		50-150%
	13C5-PFHxA	74%		50-150%
	13C4-PFHpA	68%		50-150%
	13C8-PFOA	76%		50-150%
	13C9-PFNA	77%		50-150%
	13C6-PFDA	74%		50-150%
	13C7-PFUnDA	78%		40-140%
	13C2-PFDoDA	79%		40-140%
	13C2-PFTeDA	72%		30-130%
	13C3-PFBS	77%		50-150%
	13C3-PFHxS	77%		50-150%
	13C8-PFOS	74%		50-150%
	13C8-FOSA	39%		30-130%
	d3-MeFOSAA	104%		50-150%
	13C2-4:2FTS	64%		50-150%
	13C2-6:2FTS	74%		50-150%
	13C2-8:2FTS	75%		50-150%
	13C3-HFPO-DA	71%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-89_082720		
Lab Sample ID:	FA78358-3	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54220.D	1	09/16/20 16:37	NAF	09/15/20 08:30	OP82026	S2Q806
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0123	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0082	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	0.0080	0.0017	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0052	0.0017	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0150	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	0.0012	0.0017	0.00086	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0017	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0010	0.0017	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0051	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0042	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.170	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0010	0.0017	0.00086	ug/l	J
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-89_082720		
Lab Sample ID:	FA78358-3	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	73%		35-135%
	13C5-PFPeA	76%		50-150%
	13C5-PFHxA	71%		50-150%
	13C4-PFHpA	65%		50-150%
	13C8-PFOA	74%		50-150%
	13C9-PFNA	75%		50-150%
	13C6-PFDA	70%		50-150%
	13C7-PFUnDA	73%		40-140%
	13C2-PFDoDA	75%		40-140%
	13C2-PFTeDA	75%		30-130%
	13C3-PFBS	77%		50-150%
	13C3-PFHxS	75%		50-150%
	13C8-PFOS	70%		50-150%
	13C8-FOSA	33%		30-130%
	d3-MeFOSAA	97%		50-150%
	13C2-4:2FTS	67%		50-150%
	13C2-6:2FTS	73%		50-150%
	13C2-8:2FTS	74%		50-150%
	13C3-HFPO-DA	71%		50-150%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-90_082720		
Lab Sample ID:	FA78358-4	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54221.D	1	09/16/20 16:52	NAF	09/15/20 08:30	OP82026	S2Q806
Run #2	2Q54253.D	5	09/17/20 12:45	NAF	09/15/20 08:30	OP82026	S2Q807

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2	290 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid [a]	0.0113	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0049	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	0.0074	0.0017	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0055	0.0017	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0159	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	0.0014	0.0017	0.00086	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0016	0.0017	0.00086	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0023	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0025	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0181	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0332	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	1.01 [b]	0.0086	0.0043	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-90_082720		
Lab Sample ID:	FA78358-4	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	22% [c]	23% [c]	35-135%
	13C5-PFPeA	84%	86%	50-150%
	13C5-PFHxA	77%	82%	50-150%
	13C4-PFHpA	69%	74%	50-150%
	13C8-PFOA	74%	79%	50-150%
	13C9-PFNA	73%	75%	50-150%
	13C6-PFDA	71%	73%	50-150%
	13C7-PFUnDA	69%	73%	40-140%
	13C2-PFDoDA	67%	66%	40-140%
	13C2-PFTeDA	72%	68%	30-130%
	13C3-PFBS	81%	88%	50-150%
	13C3-PFHxS	80%	78%	50-150%
	13C8-PFOS	72%	73%	50-150%
	13C8-FOSA	35%	61%	30-130%
	d3-MeFOSAA	92%	95%	50-150%
	13C2-4:2FTS	74%	78%	50-150%
	13C2-6:2FTS	74%	79%	50-150%
	13C2-8:2FTS	76%	74%	50-150%
	13C3-HFPO-DA	74%	85%	50-150%

(a) Associated ID Standard outside control limits, Confirmed by re-analysis.
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference. Confirmed by reanalysis.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-88_082720		
Lab Sample ID:	FA78358-5	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54222.D	1	09/16/20 17:07	NAF	09/15/20 08:30	OP82026	S2Q806
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0102	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	0.0010	0.0017	0.00086	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0012	0.0017	0.00086	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0088	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0017	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0021	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0036	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0030	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.271	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-88_082720		
Lab Sample ID:	FA78358-5	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	76%		35-135%
	13C5-PFPeA	80%		50-150%
	13C5-PFHxA	76%		50-150%
	13C4-PFHpA	71%		50-150%
	13C8-PFOA	78%		50-150%
	13C9-PFNA	78%		50-150%
	13C6-PFDA	76%		50-150%
	13C7-PFUnDA	76%		40-140%
	13C2-PFDoDA	71%		40-140%
	13C2-PFTeDA	64%		30-130%
	13C3-PFBS	79%		50-150%
	13C3-PFHxS	77%		50-150%
	13C8-PFOS	74%		50-150%
	13C8-FOSA	58%		30-130%
	d3-MeFOSAA	93%		50-150%
	13C2-4:2FTS	72%		50-150%
	13C2-6:2FTS	77%		50-150%
	13C2-8:2FTS	74%		50-150%
	13C3-HFPO-DA	75%		50-150%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-91_082720		
Lab Sample ID:	FA78358-6	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54223.D	1	09/16/20 17:22	NAF	09/15/20 08:30	OP82026	S2Q806
Run #2 [a]	2Q54254.D	5	09/17/20 13:00	NAF	09/15/20 08:30	OP82026	S2Q807

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2	290 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0092	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0047	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	0.0039	0.0017	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0043	0.0017	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.010	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	0.0014	0.0017	0.00086	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0012	0.0017	0.00086	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.00087	0.0017	0.00086	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0017	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0021	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0645	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0097	0.0017	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.017	0.0086	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-91_082720		
Lab Sample ID:	FA78358-6	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	71%	88%	35-135%
	13C5-PFPeA	75%	87%	50-150%
	13C5-PFHxA	69%	84%	50-150%
	13C4-PFHpA	62%	74%	50-150%
	13C8-PFOA	72%	81%	50-150%
	13C9-PFNA	75%	81%	50-150%
	13C6-PFDA	72%	77%	50-150%
	13C7-PFUnDA	73%	78%	40-140%
	13C2-PFDoDA	74%	75%	40-140%
	13C2-PFTeDA	74%	69%	30-130%
	13C3-PFBS	78%	85%	50-150%
	13C3-PFHxS	75%	81%	50-150%
	13C8-PFOS	74%	85%	50-150%
	13C8-FOSA	27% [c]	50%	30-130%
	d3-MeFOSAA	87%	106%	50-150%
	13C2-4:2FTS	65%	82%	50-150%
	13C2-6:2FTS	72%	82%	50-150%
	13C2-8:2FTS	75%	78%	50-150%
	13C3-HFPO-DA	67%	85%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNK-15_082720		
Lab Sample ID:	FA78358-7	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54251.D	1	09/17/20 12:15	NAF	09/15/20 08:30	OP82026	S2Q807
Run #2	2Q54252.D	5	09/17/20 12:30	NAF	09/15/20 08:30	OP82026	S2Q807

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2	290 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0171	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0186	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	0.0165	0.0017	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0121	0.0017	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0370	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	0.0053	0.0017	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	0.0028	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0022	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0019	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0139	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0189	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	1.35 [a]	0.0086	0.0043	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNK-15_082720		
Lab Sample ID:	FA78358-7	**Date Sampled:**	08/27/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	73%	83%	35-135%
	13C5-PFPeA	73%	84%	50-150%
	13C5-PFHxA	69%	79%	50-150%
	13C4-PFHpA	62%	73%	50-150%
	13C8-PFOA	69%	78%	50-150%
	13C9-PFNA	65%	75%	50-150%
	13C6-PFDA	65%	77%	50-150%
	13C7-PFUnDA	67%	74%	40-140%
	13C2-PFDoDA	62%	67%	40-140%
	13C2-PFTeDA	61%	59%	30-130%
	13C3-PFBS	75%	80%	50-150%
	13C3-PFHxS	71%	78%	50-150%
	13C8-PFOS	64%	74%	50-150%
	13C8-FOSA	30%	66%	30-130%
	d3-MeFOSAA	86%	90%	50-150%
	13C2-4:2FTS	65%	77%	50-150%
	13C2-6:2FTS	68%	77%	50-150%
	13C2-8:2FTS	68%	72%	50-150%
	13C3-HFPO-DA	72%	81%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-01_082720		
Lab Sample ID:	FA78358-8	**Date Sampled:**	08/27/20
Matrix:	AQ - Equipment Blank	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54238.D	1	09/17/20 09:00	NAF	09/15/20 08:30	OP82026	S2Q807
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0017	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0017	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0017	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-01_082720		
Lab Sample ID:	FA78358-8	**Date Sampled:**	08/27/20
Matrix:	AQ - Equipment Blank	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	82%		35-135%
	13C5-PFPeA	82%		50-150%
	13C5-PFHxA	79%		50-150%
	13C4-PFHpA	72%		50-150%
	13C8-PFOA	67%		50-150%
	13C9-PFNA	60%		50-150%
	13C6-PFDA	66%		50-150%
	13C7-PFUnDA	66%		40-140%
	13C2-PFDoDA	68%		40-140%
	13C2-PFTeDA	65%		30-130%
	13C3-PFBS	78%		50-150%
	13C3-PFHxS	64%		50-150%
	13C8-PFOS	63%		50-150%
	13C8-FOSA	62%		30-130%
	d3-MeFOSAA	67%		50-150%
	13C2-4:2FTS	72%		50-150%
	13C2-6:2FTS	65%		50-150%
	13C2-8:2FTS	58%		50-150%
	13C3-HFPO-DA	83%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-105_082820		
Lab Sample ID:	FA78358-9	**Date Sampled:**	08/28/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54239.D	1	09/17/20 09:14	NAF	09/15/20 08:30	OP82026	S2Q807
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0029	0.0034	0.0017	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0017	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0017	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	0.0014	0.0017	0.00086	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0017	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0054	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0023	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-105_082820		
Lab Sample ID:	FA78358-9	**Date Sampled:**	08/28/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	78%		50-150%
	13C5-PFHxA	75%		50-150%
	13C4-PFHpA	72%		50-150%
	13C8-PFOA	79%		50-150%
	13C9-PFNA	77%		50-150%
	13C6-PFDA	79%		50-150%
	13C7-PFUnDA	74%		40-140%
	13C2-PFDoDA	65%		40-140%
	13C2-PFTeDA	61%		30-130%
	13C3-PFBS	77%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	78%		50-150%
	13C8-FOSA	68%		30-130%
	d3-MeFOSAA	78%		50-150%
	13C2-4:2FTS	75%		50-150%
	13C2-6:2FTS	75%		50-150%
	13C2-8:2FTS	69%		50-150%
	13C3-HFPO-DA	80%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-103_082820		
Lab Sample ID:	FA78358-10	**Date Sampled:**	08/28/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54240.D	1	09/17/20 09:29	NAF	09/15/20 08:30	OP82026	S2Q807
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0025	0.0034	0.0017	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0017	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0017	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0017	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0054	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0041	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0380	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0052	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-103_082820		
Lab Sample ID:	FA78358-10	**Date Sampled:**	08/28/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	77%		35-135%
	13C5-PFPeA	78%		50-150%
	13C5-PFHxA	78%		50-150%
	13C4-PFHpA	77%		50-150%
	13C8-PFOA	84%		50-150%
	13C9-PFNA	79%		50-150%
	13C6-PFDA	81%		50-150%
	13C7-PFUnDA	74%		40-140%
	13C2-PFDoDA	66%		40-140%
	13C2-PFTeDA	53%		30-130%
	13C3-PFBS	79%		50-150%
	13C3-PFHxS	79%		50-150%
	13C8-PFOS	80%		50-150%
	13C8-FOSA	76%		30-130%
	d3-MeFOSAA	77%		50-150%
	13C2-4:2FTS	76%		50-150%
	13C2-6:2FTS	77%		50-150%
	13C2-8:2FTS	69%		50-150%
	13C3-HFPO-DA	85%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-95_082820		
Lab Sample ID:	FA78358-11	**Date Sampled:**	08/28/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54243.D	1	09/17/20 10:14	NAF	09/15/20 08:30	OP82026	S2Q807
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0113	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0011	0.0017	0.00086	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0013	0.0017	0.00086	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0010	0.0017	0.00086	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0063	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	0.00095	0.0017	0.00086	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0016	0.0017	0.00086	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0017	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.00097	0.0017	0.00086	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0466	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-18-95_082820
Lab Sample ID: FA78358-11
Matrix: AQ - Ground Water
Method: EPA 537M BY ID EPA 537 MOD
Project: Racer Lansing PFAS Delineation; Lansing, MI

Date Sampled: 08/28/20
Date Received: 09/01/20
Percent Solids: n/a

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	74%		35-135%
	13C5-PFPeA	74%		50-150%
	13C5-PFHxA	70%		50-150%
	13C4-PFHpA	63%		50-150%
	13C8-PFOA	69%		50-150%
	13C9-PFNA	69%		50-150%
	13C6-PFDA	69%		50-150%
	13C7-PFUnDA	73%		40-140%
	13C2-PFDoDA	74%		40-140%
	13C2-PFTeDA	67%		30-130%
	13C3-PFBS	73%		50-150%
	13C3-PFHxS	69%		50-150%
	13C8-PFOS	68%		50-150%
	13C8-FOSA	40%		30-130%
	d3-MeFOSAA	96%		50-150%
	13C2-4:2FTS	70%		50-150%
	13C2-6:2FTS	71%		50-150%
	13C2-8:2FTS	69%		50-150%
	13C3-HFPO-DA	76%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-01_082820		
Lab Sample ID:	FA78358-12	**Date Sampled:**	08/28/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q54244.D	1	09/17/20 10:29	NAF	09/15/20 08:30	OP82026	S2Q807
Run #2							

	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0107	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0011	0.0017	0.00086	ug/l	J
307-24-4	Perfluorohexanoic acid	0.00093	0.0017	0.00086	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.00093	0.0017	0.00086	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0056	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0017	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0018	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0015	0.0017	0.00086	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.0012	0.0017	0.00086	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0491	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0011	0.0017	0.00086	ug/l	J
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-01_082820		
Lab Sample ID:	FA78358-12	**Date Sampled:**	08/28/20
Matrix:	AQ - Ground Water	**Date Received:**	09/01/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	78%		50-150%
	13C5-PFHxA	74%		50-150%
	13C4-PFHpA	68%		50-150%
	13C8-PFOA	74%		50-150%
	13C9-PFNA	73%		50-150%
	13C6-PFDA	71%		50-150%
	13C7-PFUnDA	76%		40-140%
	13C2-PFDoDA	77%		40-140%
	13C2-PFTeDA	69%		30-130%
	13C3-PFBS	78%		50-150%
	13C3-PFHxS	73%		50-150%
	13C8-PFOS	71%		50-150%
	13C8-FOSA	43%		30-130%
	d3-MeFOSAA	101%		50-150%
	13C2-4:2FTS	73%		50-150%
	13C2-6:2FTS	74%		50-150%
	13C2-8:2FTS	73%		50-150%
	13C3-HFPO-DA	79%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

FA78358

SGS North America Inc - Orlando
Chain of Custody

SGS Plant 3

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # : PAGE 1 OF 1

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Tiffany.Linder@arcadis.com Email:
Phone #: 810-225-1928
Sampler(s) Name(s) (Printed)
Sampler 1: Austin Westhuis Sampler 2: Bill Cobern

Project Information

Project Name: RACER Lansing
Street: 2800 W. Saginaw Street
City: Lansing State: MI
Project #: 30042872.03700
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via Method 537 mod w/ isotope dilution per ASM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	CONTAINER INFORMATION OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NAOH+ZNAC	DI WATER	MEOH	LAB USE ONLY
1	MW-18-98_082720	8/27/20	0905	aw	GW	2		2							X	
2	MW-18-99_082720	8/27/20	1000	aw	GW	2		2							X	
3	MW-18-89_082720	8/27/20	1305	aw	GW	2		2							X	
4	MW-18-90_082720	8/27/20	1150	aw	GW	2		2							X	
5	MW-18-88_082720	8/27/20	1250	aw	GW	2		2							X	
6	MW-18-91_082720	8/27/20	1355	aw	GW	2		2							X	
7	UNK-15_082720	8/27/20	1505	aw	GW	2		2							X	
8	EB-01_082720	8/27/20	1530	aw	GW	2		2							X	
9	MW-18-105_082820	8/28/20	10:25	BC	GW	2		2							X	
10	MW-18-103_082820 MS/MSD	8/28/20	12:10	BC	GW	6		6							X	
11	MW-18-95_082820	8/28/20	13:45	BC	GW	2		2							X	
12	DUP-01_082820	8/28/20	—	BC	GW	2		2							X	

NITIAL ASESSMENT DO
ABEL VERIFICATION DO

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

- Report EGLE 28 compounds
MW-18-103 = MS/MSD

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1 Arcadis	8/31/20	2 FedEx	3 FX		4 Hayden Rosier 10:15 9/1/20
Relinquished by/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
5		6	7		8

Lab Use Only : Cooler Temperature (s) Celsius (corrected):

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

4.2 4

FA78358: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA78358 **Client:** ARCADIS **Project:** RACER LANSING

Date / Time Received: 9/1/2020 10:15:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 138666018123

Therm ID: IR 1; **Therm CF:** -0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (1.4);

Cooler Temps (Corrected) °C: Cooler 1: (1.2);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: MAGALEAK Date: 9/1/2020 10:15:00 AM Reviewer: _____ Date: _____

FA78358: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82026-MB	2Q54217.D	1	09/16/20	NAF	09/15/20	OP82026	S2Q806

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0017	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0017	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0017	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0017	0.00086	ug/l	
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	81%	35-135%
	13C5-PFPeA	85%	50-150%
	13C5-PFHxA	84%	50-150%
	13C4-PFHpA	83%	50-150%

Method Blank Summary

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82026-MB	2Q54217.D	1	09/16/20	NAF	09/15/20	OP82026	S2Q806

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	88%	50-150%
	13C9-PFNA	85%	50-150%
	13C6-PFDA	82%	50-150%
	13C7-PFUnDA	77%	40-140%
	13C2-PFDoDA	73%	40-140%
	13C2-PFTeDA	74%	30-130%
	13C3-PFBS	85%	50-150%
	13C3-PFHxS	88%	50-150%
	13C8-PFOS	81%	50-150%
	13C8-FOSA	74%	30-130%
	d3-MeFOSAA	80%	50-150%
	13C2-4:2FTS	78%	50-150%
	13C2-6:2FTS	77%	50-150%
	13C2-8:2FTS	72%	50-150%
	13C3-HFPO-DA	81%	50-150%

Method Blank Summary

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82026-MB	2Q54237.D	1	09/17/20	NAF	09/15/20	OP82026	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0034	0.0017	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0017	0.00086	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0017	0.00086	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0017	0.00086	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0017	0.00086	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0017	0.00086	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0017	0.00086	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0017	0.00086	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0017	0.00086	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0017	0.00086	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0017	0.00086	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0017	0.00086	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0017	0.00086	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0017	0.00086	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0017	0.00086	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0017	0.00086	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0017	0.00086	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0017	0.00086	ug/l	
754-91-6	PFOSA	ND	0.0034	0.0017	ug/l	
2355-31-9	MeFOSAA	ND	0.0034	0.0017	ug/l	
2991-50-6	EtFOSAA	ND	0.0034	0.0017	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0069	0.0017	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0086	0.0034	ug/l	
919005-14-4	ADONA	ND	0.0069	0.0017	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0069	0.0017	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0069	0.0017	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	82%	35-135%
	13C5-PFPeA	81%	50-150%
	13C5-PFHxA	81%	50-150%
	13C4-PFHpA	80%	50-150%

Method Blank Summary

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82026-MB	2Q54237.D	1	09/17/20	NAF	09/15/20	OP82026	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	81%	50-150%
	13C9-PFNA	78%	50-150%
	13C6-PFDA	80%	50-150%
	13C7-PFUnDA	75%	40-140%
	13C2-PFDoDA	68%	40-140%
	13C2-PFTeDA	64%	30-130%
	13C3-PFBS	82%	50-150%
	13C3-PFHxS	82%	50-150%
	13C8-PFOS	80%	50-150%
	13C8-FOSA	72%	30-130%
	d3-MeFOSAA	75%	50-150%
	13C2-4:2FTS	78%	50-150%
	13C2-6:2FTS	74%	50-150%
	13C2-8:2FTS	70%	50-150%
	13C3-HFPO-DA	84%	50-150%

Instrument Blank

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q806-IBLK	2Q54200.D	1	09/16/20	NAF	n/a	n/a	S2Q806

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.020	0.0050	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	96%	50-150%
	13C4-PFHpA	96%	50-150%
	13C8-PFOA	99%	50-150%
	13C9-PFNA	95%	50-150%

Instrument Blank

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q806-IBLK	2Q54200.D	1	09/16/20	NAF	n/a	n/a	S2Q806

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	96%	50-150%
	13C7-PFUnDA	96%	50-150%
	13C2-PFDoDA	95%	50-150%
	13C2-PFTeDA	96%	50-150%
	13C3-PFBS	94%	50-150%
	13C3-PFHxS	95%	50-150%
	13C8-PFOS	96%	50-150%
	d3-MeFOSAA	96%	50-150%
	13C3-HFPO-DA	93%	50-150%

Instrument Blank

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q807-IBLK	2Q54232.D	1	09/17/20	NAF	n/a	n/a	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA78358-4, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.020	0.0050	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	93%	50-150%
	13C4-PFHpA	93%	50-150%
	13C8-PFOA	93%	50-150%
	13C9-PFNA	88%	50-150%

Instrument Blank

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q807-IBLK	2Q54232.D	1	09/17/20	NAF	n/a	n/a	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA78358-4, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	92%	50-150%
	13C7-PFUnDA	92%	50-150%
	13C2-PFDoDA	86%	50-150%
	13C2-PFTeDA	82%	50-150%
	13C3-PFBS	95%	50-150%
	13C3-PFHxS	93%	50-150%
	13C8-PFOS	94%	50-150%
	d3-MeFOSAA	92%	50-150%
	13C3-HFPO-DA	101%	50-150%

Blank Spike Summary

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82026-BS	2Q54216.D	1	09/16/20	NAF	09/15/20	OP82026	S2Q806

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.069	0.0663	96	70-130
2706-90-3	Perfluoropentanoic acid	0.069	0.0625	91	70-130
307-24-4	Perfluorohexanoic acid	0.069	0.0656	95	70-130
375-85-9	Perfluoroheptanoic acid	0.069	0.0678	98	70-130
335-67-1	Perfluorooctanoic acid	0.069	0.0668	97	70-130
375-95-1	Perfluorononanoic acid	0.069	0.0640	93	70-130
335-76-2	Perfluorodecanoic acid	0.069	0.0652	95	70-130
2058-94-8	Perfluoroundecanoic acid	0.069	0.0677	98	70-130
307-55-1	Perfluorododecanoic acid	0.069	0.0650	94	70-130
72629-94-8	Perfluorotridecanoic acid	0.069	0.0655	95	65-130
376-06-7	Perfluorotetradecanoic acid	0.069	0.0646	94	70-130
375-73-5	Perfluorobutanesulfonic acid	0.069	0.0629	91	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.069	0.0639	93	70-130
355-46-4	Perfluorohexanesulfonic acid	0.069	0.0610	88	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.069	0.0698	101	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.069	0.0665	96	70-130
68259-12-1	Perfluorononanesulfonic acid	0.069	0.0647	94	65-130
335-77-3	Perfluorodecanesulfonic acid	0.069	0.0642	93	60-130
754-91-6	PFOSA	0.069	0.0655	95	70-130
2355-31-9	MeFOSAA	0.069	0.0635	92	70-130
2991-50-6	EtFOSAA	0.069	0.0649	94	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.069	0.0661	96	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.069	0.0714	104	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.069	0.0679	98	70-130
13252-13-6	HFPO-DA (GenX)	0.069	0.0657	95	60-140
919005-14-4	ADONA	0.069	0.0637	92	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.069	0.0602	87	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.069	0.0612	89	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	83%	35-135%
	13C5-PFPeA	87%	50-150%
	13C5-PFHxA	87%	50-150%
	13C4-PFHpA	85%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82026-BS	2Q54216.D	1	09/16/20	NAF	09/15/20	OP82026	S2Q806

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	90%	50-150%
	13C9-PFNA	88%	50-150%
	13C6-PFDA	86%	50-150%
	13C7-PFUnDA	80%	40-140%
	13C2-PFDoDA	77%	40-140%
	13C2-PFTeDA	77%	30-130%
	13C3-PFBS	88%	50-150%
	13C3-PFHxS	90%	50-150%
	13C8-PFOS	86%	50-150%
	13C8-FOSA	75%	30-130%
	d3-MeFOSAA	84%	50-150%
	13C2-4:2FTS	85%	50-150%
	13C2-6:2FTS	81%	50-150%
	13C2-8:2FTS	78%	50-150%
	13C3-HFPO-DA	84%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82026-BS	2Q54236.D	1	09/17/20	NAF	09/15/20	OP82026	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.069	0.0636	92	70-130
2706-90-3	Perfluoropentanoic acid	0.069	0.0643	93	70-130
307-24-4	Perfluorohexanoic acid	0.069	0.0645	94	70-130
375-85-9	Perfluoroheptanoic acid	0.069	0.0690	100	70-130
335-67-1	Perfluorooctanoic acid	0.069	0.0686	99	70-130
375-95-1	Perfluorononanoic acid	0.069	0.0655	95	70-130
335-76-2	Perfluorodecanoic acid	0.069	0.0617	89	70-130
2058-94-8	Perfluoroundecanoic acid	0.069	0.0675	98	70-130
307-55-1	Perfluorododecanoic acid	0.069	0.0651	94	70-130
72629-94-8	Perfluorotridecanoic acid	0.069	0.0712	103	65-130
376-06-7	Perfluorotetradecanoic acid	0.069	0.0678	98	70-130
375-73-5	Perfluorobutanesulfonic acid	0.069	0.0638	93	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.069	0.0646	94	70-130
355-46-4	Perfluorohexanesulfonic acid	0.069	0.0591	86	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.069	0.0681	99	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.069	0.0652	95	70-130
68259-12-1	Perfluorononanesulfonic acid	0.069	0.0622	90	65-130
335-77-3	Perfluorodecanesulfonic acid	0.069	0.0606	88	60-130
754-91-6	PFOSA	0.069	0.0672	97	70-130
2355-31-9	MeFOSAA	0.069	0.0662	96	70-130
2991-50-6	EtFOSAA	0.069	0.0667	97	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.069	0.0668	97	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.069	0.0713	103	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.069	0.0662	96	70-130
13252-13-6	HFPO-DA (GenX)	0.069	0.0663	96	60-140
919005-14-4	ADONA	0.069	0.0687	100	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.069	0.0595	86	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.069	0.0603	87	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	84%	35-135%
	13C5-PFPeA	83%	50-150%
	13C5-PFHxA	83%	50-150%
	13C4-PFHpA	82%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82026-BS	2Q54236.D	1	09/17/20	NAF	09/15/20	OP82026	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	82%	50-150%
	13C9-PFNA	82%	50-150%
	13C6-PFDA	84%	50-150%
	13C7-PFUnDA	77%	40-140%
	13C2-PFDoDA	71%	40-140%
	13C2-PFTeDA	66%	30-130%
	13C3-PFBS	84%	50-150%
	13C3-PFHxS	85%	50-150%
	13C8-PFOS	83%	50-150%
	13C8-FOSA	71%	30-130%
	d3-MeFOSAA	80%	50-150%
	13C2-4:2FTS	82%	50-150%
	13C2-6:2FTS	75%	50-150%
	13C2-8:2FTS	79%	50-150%
	13C3-HFPO-DA	86%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82026-MS	2Q54241.D	1	09/17/20	NAF	09/15/20	OP82026	S2Q807
OP82026-MSD	2Q54242.D	1	09/17/20	NAF	09/15/20	OP82026	S2Q807
FA78358-10	2Q54240.D	1	09/17/20	NAF	09/15/20	OP82026	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	Compound	FA78358-10 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	0.0025	J	0.069	0.0623	87	0.069	0.0652	91	5	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.069	0.0610	88	0.069	0.0634	92	4	70-130/30
307-24-4	Perfluorohexanoic acid	ND		0.069	0.0618	90	0.069	0.0644	93	4	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.069	0.0665	96	0.069	0.0683	99	3	70-130/30
335-67-1	Perfluorooctanoic acid	ND		0.069	0.0631	91	0.069	0.0664	96	5	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.069	0.0617	89	0.069	0.0658	95	6	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.069	0.0594	86	0.069	0.0625	91	5	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.069	0.0629	91	0.069	0.0653	95	4	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.069	0.0630	91	0.069	0.0654	95	4	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.069	0.0703	102	0.069	0.0738	107	5	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.069	0.0653	95	0.069	0.0666	97	2	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0054		0.069	0.0643	85	0.069	0.0674	90	5	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	0.0041		0.069	0.0637	86	0.069	0.0655	89	3	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.0380		0.069	0.0892	74	0.069	0.0934	80	5	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.069	0.0668	97	0.069	0.0701	102	5	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0052		0.069	0.0640	85	0.069	0.0682	91	6	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.069	0.0576	84	0.069	0.0603	87	5	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.069	0.0578	84	0.069	0.0596	86	3	60-130/30
754-91-6	PFOSA	ND		0.069	0.0646	94	0.069	0.0653	95	1	70-130/30
2355-31-9	MeFOSAA	ND		0.069	0.0623	90	0.069	0.0644	93	3	70-130/30
2991-50-6	EtFOSAA	ND		0.069	0.0629	91	0.069	0.0652	95	4	70-130/30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.069	0.0630	91	0.069	0.0656	95	4	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.069	0.0676	98	0.069	0.0697	101	3	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.069	0.0648	94	0.069	0.0678	98	5	70-130/30
13252-13-6	HFPO-DA (GenX)	ND		0.069	0.0609	88	0.069	0.0638	93	5	60-140/30
919005-14-4	ADONA	ND		0.069	0.0609	88	0.069	0.0633	92	4	60-140/30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.069	0.0555	80	0.069	0.0594	86	7	60-140/30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		0.069	0.0607	88	0.069	0.0622	90	2	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA78358-10	Limits
	13C4-PFBA	82%	87%	77%	35-135%
	13C5-PFPeA	84%	90%	78%	50-150%
	13C5-PFHxA	84%	90%	78%	50-150%
	13C4-PFHpA	82%	88%	77%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA78358
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP82026-MS	2Q54241.D	1	09/17/20	NAF	09/15/20	OP82026	S2Q807
OP82026-MSD	2Q54242.D	1	09/17/20	NAF	09/15/20	OP82026	S2Q807
FA78358-10	2Q54240.D	1	09/17/20	NAF	09/15/20	OP82026	S2Q807

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA78358-1, FA78358-2, FA78358-3, FA78358-4, FA78358-5, FA78358-6, FA78358-7, FA78358-8, FA78358-9, FA78358-10, FA78358-11, FA78358-12

CAS No.	ID Standard Recoveries	MS	MSD	FA78358-10	Limits
	13C8-PFOA	88%	94%	84%	50-150%
	13C9-PFNA	84%	89%	79%	50-150%
	13C6-PFDA	86%	89%	81%	50-150%
	13C7-PFUnDA	79%	80%	74%	40-140%
	13C2-PFDoDA	70%	73%	66%	40-140%
	13C2-PFTeDA	62%	63%	53%	30-130%
	13C3-PFBS	83%	88%	79%	50-150%
	13C3-PFHxS	84%	94%	79%	50-150%
	13C8-PFOS	86%	90%	80%	50-150%
	13C8-FOSA	80%	84%	76%	30-130%
	d3-MeFOSAA	83%	86%	77%	50-150%
	13C2-4:2FTS	84%	92%	76%	50-150%
	13C2-6:2FTS	83%	90%	77%	50-150%
	13C2-8:2FTS	78%	81%	69%	50-150%
	13C3-HFPO-DA	88%	92%	85%	50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03100

SGS Job Number: FA77230

Sampling Dates: 07/14/20 - 07/24/20

Report to:

andrea.colby@sgs.com

Total number of pages in report: 52

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

This report shall not be reproduced, except in its entirety, without the written approval of SGS.
Test results relate only to samples analyzed.

October 20, 2020

Mr. Alex Villhauer
Arcadis
300 S Washington Sq
Lansing, MI 48933

RE: SGS North America Inc. - Orlando job FA78294 Reissue

Dear Mr. Villhauer,

The final report for job number FA77230 has been edited to reflect requested corrections. These edits have been incorporated into the revised report.

The sample ID has been corrected on -17.

SGS North America Inc. - Orlando apologies for any inconvenience this may have caused. Please feel free to contact us if we can be of further assistance.

Sincerely,

SGS North America, Inc. - Orlando

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA77230

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03100

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA77230-1	07/14/20	14:15	AWKD	07/28/20	SO	Soil	SB-P2-OM185_0.6-1
FA77230-2	07/14/20	14:20	AWKD	07/28/20	SO	Soil	SB-P2-OM185_9-9.5
FA77230-3	07/14/20	14:25	AWKD	07/28/20	SO	Soil	SB-P2-OM185_19.5-20
FA77230-4	07/14/20	14:30	AWKD	07/28/20	SO	Soil	SB-P2-OM185_31-31.5
FA77230-5	07/17/20	14:15	AWKD	07/28/20	SO	Soil	SB-P2-OM185_41-41.5
FA77230-6	07/17/20	14:35	AWKD	07/28/20	SO	Soil	SB-P2-OM185_52-52.5
FA77230-7	07/17/20	14:55	AWKD	07/28/20	SO	Soil	SB-P2-OM185_59.5-60
FA77230-8	07/20/20	15:43	AWKD	07/28/20	AQ	Ground Water	VAP-P6-PG211_4-9
FA77230-9	07/20/20	00:00	AWKD	07/28/20	AQ	Ground Water	DUP-01
FA77230-10	07/23/20	08:28	AWKD	07/28/20	AQ	Ground Water	VAP-P2-NV170_6-11
FA77230-11	07/23/20	08:36	AWKD	07/28/20	AQ	Ground Water	VAP-P2-NV170_18.5-23.5
FA77230-12	07/23/20	14:13	AWKD	07/28/20	AQ	Ground Water	VAP-P6-OL211_1-6

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Sample Summary
(continued)

Arcadis

Job No: FA77230

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03100

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA77230-13	07/23/20	14:45	AWKD	07/28/20	AQ	Ground Water	VAP-P6-OL211_33-38
FA77230-14	07/23/20	17:50	AWKD	07/28/20	AQ	Ground Water	MW-20-130_072320
FA77230-15	07/24/20	13:53	AWKD	07/28/20	AQ	Ground Water	VAP-P2-OP164_10-15
FA77230-16	07/24/20	14:10	AWKD	07/28/20	AQ	Ground Water	VAP-P2-OP164_27-32
FA77230-17	07/24/20	14:45	AWKD	07/28/20	AQ	Ground Water	VAP-P2-PP185_19-24
FA77230-18	07/24/20	16:10	AWKD	07/28/20	AQ	Field Blank Water	FB_072420

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Summary of Hits

Job Number: FA77230
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 07/14/20 thru 07/24/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA77230-1	**SB-P2-OM185_0.6-1**					
Perfluorooctanesulfonic acid		1.5	0.54	0.27	ug/kg	EPA 537M BY ID
FA77230-2	**SB-P2-OM185_9-9.5**					
Perfluorooctanesulfonic acid		4.5	0.48	0.24	ug/kg	EPA 537M BY ID
FA77230-3	**SB-P2-OM185_19.5-20**					
No hits reported in this sample.						
FA77230-4	**SB-P2-OM185_31-31.5**					
No hits reported in this sample.						
FA77230-5	**SB-P2-OM185_41-41.5**					
No hits reported in this sample.						
FA77230-6	**SB-P2-OM185_52-52.5**					
No hits reported in this sample.						
FA77230-7	**SB-P2-OM185_59.5-60**					
No hits reported in this sample.						
FA77230-8	**VAP-P6-PG211_4-9**					
Perfluorobutanoic acid		0.0243	0.0080	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0540	0.0040	0.0015	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0500	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0496	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0982	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0135	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0107	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0020 J	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0011 J	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0489	0.0040	0.0015	ug/l	EPA 537M BY ID
PFOSA		0.0018 J	0.0040	0.0010	ug/l	EPA 537M BY ID
FA77230-9	**DUP-01**					
Perfluorobutanoic acid		0.0242	0.0080	0.0020	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA77230
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 07/14/20 thru 07/24/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluoropentanoic acid		0.0535	0.0040	0.0015	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0508	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0502	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0986	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0132	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0104	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0016 J	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0461	0.0040	0.0015	ug/l	EPA 537M BY ID
PFOSA		0.0014 J	0.0040	0.0010	ug/l	EPA 537M BY ID
FA77230-10	**VAP-P2-NV170_6-11**					
Perfluorobutanoic acid		0.0128	0.0080	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0193	0.0040	0.0015	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0174	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0144	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0288	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0035 J	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0021 J	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0047	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0073	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0627	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0047	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.137	0.0040	0.0015	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		0.0029 J	0.0080	0.0020	ug/l	EPA 537M BY ID
FA77230-11	**VAP-P2-NV170_18.5-23.5**					
Perfluorobutanoic acid		0.0183	0.0080	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0170	0.0040	0.0015	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0210	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0151	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0297	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0031 J	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0025 J	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.180	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0164	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0238	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0025 J	0.0040	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0454	0.0040	0.0015	ug/l	EPA 537M BY ID
FA77230-12	**VAP-P6-OL211_1-6**					
Perfluorobutanoic acid		0.0219	0.0091	0.0023	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0057	0.0045	0.0017	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA77230
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 07/14/20 thru 07/24/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorohexanoic acid		0.0052	0.0045	0.0011	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0042 J	0.0045	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0057	0.0045	0.0011	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0021 J	0.0045	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0030 J	0.0045	0.0017	ug/l	EPA 537M BY ID
FA77230-13	**VAP-P6-OL211_33-38**					
No hits reported in this sample.						
FA77230-14	**MW-20-130_072320**					
Perfluorobutanoic acid		0.0061 J	0.0077	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0016 J	0.0038	0.0014	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0023 J	0.0038	0.00096	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0101	0.0038	0.00096	ug/l	EPA 537M BY ID
FA77230-15	**VAP-P2-OP164_10-15**					
Perfluorobutanoic acid		0.0781	0.0077	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0294	0.0038	0.0014	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0228	0.0038	0.00096	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0086	0.0038	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0214	0.0038	0.00096	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0063	0.0038	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0020 J	0.0038	0.0014	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		0.0064 J	0.0077	0.0019	ug/l	EPA 537M BY ID
FA77230-16	**VAP-P2-OP164_27-32**					
Perfluorobutanoic acid [a]		0.0289	0.0077	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0036 J	0.0038	0.0014	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0028 J	0.0038	0.00096	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0019 J	0.0038	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0089	0.0038	0.00096	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0017 J	0.0038	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0043	0.0038	0.0014	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		0.0043 J	0.0077	0.0019	ug/l	EPA 537M BY ID
FA77230-17	**VAP-P2-PP185_19-24**					
Perfluorobutanoic acid		0.0041 J	0.0077	0.0019	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0016 J	0.0038	0.00096	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA77230
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 07/14/20 thru 07/24/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method

FA77230-18 **FB_072420**

No hits reported in this sample.

(a) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	SB-P2-OM185_0.6-1		
Lab Sample ID:	FA77230-1	**Date Sampled:**	07/14/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	91.2
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q4440.D	1	08/11/20 22:39	NAF	08/10/20 08:00	OP81492	S4Q62
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	1.1	0.41	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.54	0.27	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.54	0.27	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.54	0.27	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.54	0.27	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.54	0.27	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.54	0.27	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.54	0.27	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.54	0.27	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.54	0.29	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.54	0.27	ug/kg	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.54	0.27	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.54	0.27	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.54	0.27	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.54	0.27	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	1.5	0.54	0.27	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.54	0.27	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.54	0.27	ug/kg	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.54	0.27	ug/kg	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	1.1	0.54	ug/kg	
2991-50-6	EtFOSAA	ND	1.1	0.54	ug/kg	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	1.1	0.27	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	1.1	0.27	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_0.6-1		
Lab Sample ID:	FA77230-1	**Date Sampled:**	07/14/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	91.2
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	1.1	0.27	ug/kg	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	2.7	0.54	ug/kg	
919005-14-4	ADONA	ND	0.54	0.27	ug/kg	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.54	0.31	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.54	0.28	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	75%		40-140%
	13C5-PFPeA	83%		50-150%
	13C5-PFHxA	85%		50-150%
	13C4-PFHpA	87%		50-150%
	13C8-PFOA	88%		50-150%
	13C9-PFNA	86%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	84%		40-140%
	13C2-PFDoDA	80%		40-140%
	13C2-PFTeDA	86%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	88%		50-150%
	13C8-PFOS	84%		50-150%
	13C8-FOSA	96%		30-130%
	d3-MeFOSAA	84%		50-150%
	13C2-4:2FTS	81%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	80%		50-150%
	13C3-HFPO-DA	79%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_9-9.5		
Lab Sample ID:	FA77230-2	**Date Sampled:**	07/14/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	86.7
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q4441.D	1	08/11/20 22:55	NAF	08/10/20 08:00	OP81492	S4Q62
Run #2							

	Initial Weight	Final Volume
Run #1	2.42 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.95	0.36	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.48	0.24	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.48	0.24	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.48	0.24	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.48	0.24	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.48	0.24	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.48	0.24	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.48	0.24	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.48	0.24	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.48	0.25	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.48	0.24	ug/kg	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.48	0.24	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.48	0.24	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.48	0.24	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.48	0.24	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	4.5	0.48	0.24	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.48	0.24	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.48	0.24	ug/kg	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.48	0.24	ug/kg	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.95	0.48	ug/kg	
2991-50-6	EtFOSAA	ND	0.95	0.48	ug/kg	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.95	0.24	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.95	0.24	ug/kg	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_9-9.5		
Lab Sample ID:	FA77230-2	**Date Sampled:**	07/14/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	86.7
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.95	0.24	ug/kg	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	2.4	0.48	ug/kg	
919005-14-4	ADONA	ND	0.48	0.24	ug/kg	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.48	0.28	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.48	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	80%		40-140%
	13C5-PFPeA	88%		50-150%
	13C5-PFHxA	90%		50-150%
	13C4-PFHpA	91%		50-150%
	13C8-PFOA	94%		50-150%
	13C9-PFNA	92%		50-150%
	13C6-PFDA	91%		50-150%
	13C7-PFUnDA	88%		40-140%
	13C2-PFDoDA	85%		40-140%
	13C2-PFTeDA	86%		30-130%
	13C3-PFBS	91%		50-150%
	13C3-PFHxS	94%		50-150%
	13C8-PFOS	91%		50-150%
	13C8-FOSA	101%		30-130%
	d3-MeFOSAA	87%		50-150%
	13C2-4:2FTS	86%		50-150%
	13C2-6:2FTS	90%		50-150%
	13C2-8:2FTS	84%		50-150%
	13C3-HFPO-DA	85%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_19.5-20		
Lab Sample ID:	FA77230-3	**Date Sampled:**	07/14/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	83.9
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q4442.D	1	08/11/20 23:11	NAF	08/10/20 08:00	OP81492	S4Q62
Run #2							

	Initial Weight	Final Volume
Run #1	2.62 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.91	0.35	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.45	0.23	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.45	0.23	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.45	0.23	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.45	0.23	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.45	0.23	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.45	0.23	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.45	0.23	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.45	0.23	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.45	0.24	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.45	0.23	ug/kg	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.45	0.23	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.45	0.23	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.45	0.23	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.45	0.23	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.45	0.23	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.45	0.23	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.45	0.23	ug/kg	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.45	0.23	ug/kg	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.91	0.45	ug/kg	
2991-50-6	EtFOSAA	ND	0.91	0.45	ug/kg	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.91	0.23	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.91	0.23	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_19.5-20		
Lab Sample ID:	FA77230-3	**Date Sampled:**	07/14/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	83.9
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.91	0.23	ug/kg	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	2.3	0.45	ug/kg	
919005-14-4	ADONA	ND	0.45	0.23	ug/kg	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.45	0.26	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.45	0.24	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	73%		40-140%
	13C5-PFPeA	86%		50-150%
	13C5-PFHxA	89%		50-150%
	13C4-PFHpA	89%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	91%		50-150%
	13C6-PFDA	89%		50-150%
	13C7-PFUnDA	85%		40-140%
	13C2-PFDoDA	83%		40-140%
	13C2-PFTeDA	84%		30-130%
	13C3-PFBS	90%		50-150%
	13C3-PFHxS	92%		50-150%
	13C8-PFOS	91%		50-150%
	13C8-FOSA	100%		30-130%
	d3-MeFOSAA	85%		50-150%
	13C2-4:2FTS	85%		50-150%
	13C2-6:2FTS	90%		50-150%
	13C2-8:2FTS	85%		50-150%
	13C3-HFPO-DA	81%		50-150%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_31-31.5		
Lab Sample ID:	FA77230-4	**Date Sampled:**	07/14/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	81.7
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q4443.D	1	08/11/20 23:26	NAF	08/10/20 08:00	OP81492	S4Q62
Run #2							

	Initial Weight	Final Volume
Run #1	2.11 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	1.2	0.44	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.58	0.29	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.58	0.29	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.58	0.29	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.58	0.29	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.58	0.29	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.58	0.29	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.58	0.29	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.58	0.29	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.58	0.31	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.58	0.29	ug/kg	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.58	0.29	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.58	0.29	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.58	0.29	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.58	0.29	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.58	0.29	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.58	0.29	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.58	0.29	ug/kg	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.58	0.29	ug/kg	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	1.2	0.58	ug/kg	
2991-50-6	EtFOSAA	ND	1.2	0.58	ug/kg	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	1.2	0.29	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	1.2	0.29	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_31-31.5		
Lab Sample ID:	FA77230-4	**Date Sampled:**	07/14/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	81.7
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	1.2	0.29	ug/kg	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	2.9	0.58	ug/kg	
919005-14-4	ADONA	ND	0.58	0.29	ug/kg	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.58	0.34	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.58	0.30	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	80%		40-140%
	13C5-PFPeA	93%		50-150%
	13C5-PFHxA	97%		50-150%
	13C4-PFHpA	97%		50-150%
	13C8-PFOA	102%		50-150%
	13C9-PFNA	99%		50-150%
	13C6-PFDA	98%		50-150%
	13C7-PFUnDA	93%		40-140%
	13C2-PFDoDA	90%		40-140%
	13C2-PFTeDA	91%		30-130%
	13C3-PFBS	98%		50-150%
	13C3-PFHxS	99%		50-150%
	13C8-PFOS	98%		50-150%
	13C8-FOSA	109%		30-130%
	d3-MeFOSAA	94%		50-150%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	97%		50-150%
	13C2-8:2FTS	90%		50-150%
	13C3-HFPO-DA	91%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_41-41.5		
Lab Sample ID:	FA77230-5	**Date Sampled:**	07/17/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	90.1
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q4444.D	1	08/11/20 23:42	NAF	08/10/20 08:00	OP81492	S4Q62
Run #2							

	Initial Weight	Final Volume
Run #1	2.06 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	1.1	0.41	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.54	0.27	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.54	0.27	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.54	0.27	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.54	0.27	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.54	0.27	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.54	0.27	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.54	0.27	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.54	0.27	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.54	0.29	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.54	0.27	ug/kg	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.54	0.27	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.54	0.27	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.54	0.27	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.54	0.27	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.54	0.27	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.54	0.27	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.54	0.27	ug/kg	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.54	0.27	ug/kg	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	1.1	0.54	ug/kg	
2991-50-6	EtFOSAA	ND	1.1	0.54	ug/kg	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	1.1	0.27	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	1.1	0.27	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_41-41.5		
Lab Sample ID:	FA77230-5	**Date Sampled:**	07/17/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	90.1
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	1.1	0.27	ug/kg	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	2.7	0.54	ug/kg	
919005-14-4	ADONA	ND	0.54	0.27	ug/kg	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.54	0.31	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.54	0.28	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	75%		40-140%
	13C5-PFPeA	84%		50-150%
	13C5-PFHxA	87%		50-150%
	13C4-PFHpA	88%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	88%		50-150%
	13C6-PFDA	87%		50-150%
	13C7-PFUnDA	85%		40-140%
	13C2-PFDoDA	83%		40-140%
	13C2-PFTeDA	84%		30-130%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	89%		50-150%
	13C8-PFOS	86%		50-150%
	13C8-FOSA	98%		30-130%
	d3-MeFOSAA	86%		50-150%
	13C2-4:2FTS	82%		50-150%
	13C2-6:2FTS	87%		50-150%
	13C2-8:2FTS	82%		50-150%
	13C3-HFPO-DA	82%		50-150%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_52-52.5		
Lab Sample ID:	FA77230-6	**Date Sampled:**	07/17/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	96.1
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q4445.D	1	08/11/20 23:57	NAF	08/10/20 08:00	OP81492	S4Q62
Run #2							

	Initial Weight	Final Volume
Run #1	2.16 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.96	0.37	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.48	0.24	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.48	0.24	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.48	0.24	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.48	0.24	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.48	0.24	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.48	0.24	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.48	0.24	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.48	0.24	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.48	0.26	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.48	0.24	ug/kg	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.48	0.24	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.48	0.24	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.48	0.24	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.48	0.24	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.48	0.24	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.48	0.24	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.48	0.24	ug/kg	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.48	0.24	ug/kg	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.96	0.48	ug/kg	
2991-50-6	EtFOSAA	ND	0.96	0.48	ug/kg	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.96	0.24	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.96	0.24	ug/kg	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_52-52.5		
Lab Sample ID:	FA77230-6	**Date Sampled:**	07/17/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	96.1
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.96	0.24	ug/kg	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	2.4	0.48	ug/kg	
919005-14-4	ADONA	ND	0.48	0.24	ug/kg	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.48	0.28	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.48	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	77%		40-140%
	13C5-PFPeA	91%		50-150%
	13C5-PFHxA	94%		50-150%
	13C4-PFHpA	94%		50-150%
	13C8-PFOA	98%		50-150%
	13C9-PFNA	95%		50-150%
	13C6-PFDA	92%		50-150%
	13C7-PFUnDA	90%		40-140%
	13C2-PFDoDA	88%		40-140%
	13C2-PFTeDA	89%		30-130%
	13C3-PFBS	96%		50-150%
	13C3-PFHxS	95%		50-150%
	13C8-PFOS	96%		50-150%
	13C8-FOSA	107%		30-130%
	d3-MeFOSAA	90%		50-150%
	13C2-4:2FTS	89%		50-150%
	13C2-6:2FTS	94%		50-150%
	13C2-8:2FTS	88%		50-150%
	13C3-HFPO-DA	88%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_59.5-60		
Lab Sample ID:	FA77230-7	**Date Sampled:**	07/17/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	93.1
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q4448.D	1	08/12/20 00:44	NAF	08/10/20 08:00	OP81492	S4Q62
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	1.1	0.41	ug/kg	
2706-90-3	Perfluoropentanoic acid	ND	0.53	0.27	ug/kg	
307-24-4	Perfluorohexanoic acid	ND	0.53	0.27	ug/kg	
375-85-9	Perfluoroheptanoic acid	ND	0.53	0.27	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.53	0.27	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.53	0.27	ug/kg	
335-76-2	Perfluorodecanoic acid	ND	0.53	0.27	ug/kg	
2058-94-8	Perfluoroundecanoic acid	ND	0.53	0.27	ug/kg	
307-55-1	Perfluorododecanoic acid	ND	0.53	0.27	ug/kg	
72629-94-8	Perfluorotridecanoic acid	ND	0.53	0.28	ug/kg	
376-06-7	Perfluorotetradecanoic acid	ND	0.53	0.27	ug/kg	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.53	0.27	ug/kg	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.53	0.27	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.53	0.27	ug/kg	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.53	0.27	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.53	0.27	ug/kg	
68259-12-1	Perfluorononanesulfonic acid	ND	0.53	0.27	ug/kg	
335-77-3	Perfluorodecanesulfonic acid	ND	0.53	0.27	ug/kg	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.53	0.27	ug/kg	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	1.1	0.53	ug/kg	
2991-50-6	EtFOSAA	ND	1.1	0.53	ug/kg	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	1.1	0.27	ug/kg	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	1.1	0.27	ug/kg	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SB-P2-OM185_59.5-60		
Lab Sample ID:	FA77230-7	**Date Sampled:**	07/17/20
Matrix:	SO - Soil	**Date Received:**	07/28/20
Method:	EPA 537M BY ID IN HOUSE	**Percent Solids:**	93.1
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	1.1	0.27	ug/kg	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	2.7	0.53	ug/kg	
919005-14-4	ADONA	ND	0.53	0.27	ug/kg	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.53	0.31	ug/kg	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.53	0.28	ug/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	71%		40-140%
	13C5-PFPeA	83%		50-150%
	13C5-PFHxA	86%		50-150%
	13C4-PFHpA	86%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	87%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	82%		40-140%
	13C2-PFDoDA	79%		40-140%
	13C2-PFTeDA	83%		30-130%
	13C3-PFBS	87%		50-150%
	13C3-PFHxS	87%		50-150%
	13C8-PFOS	86%		50-150%
	13C8-FOSA	97%		30-130%
	d3-MeFOSAA	83%		50-150%
	13C2-4:2FTS	82%		50-150%
	13C2-6:2FTS	85%		50-150%
	13C2-8:2FTS	80%		50-150%
	13C3-HFPO-DA	82%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P6-PG211_4-9		
Lab Sample ID:	FA77230-8	**Date Sampled:**	07/20/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q52171.D	1	08/03/20 18:29	NAF	07/31/20 10:30	OP81355	S2Q776
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0243	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0540	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	0.0500	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0496	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0982	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0135	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0107	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0020	0.0040	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0040	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0489	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	0.0018	0.0040	0.0010	ug/l	J
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P6-PG211_4-9		
Lab Sample ID:	FA77230-8	**Date Sampled:**	07/20/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.020	0.0050	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	88%		35-135%
	13C5-PFPeA	86%		50-150%
	13C5-PFHxA	86%		50-150%
	13C4-PFHpA	86%		50-150%
	13C8-PFOA	89%		50-150%
	13C9-PFNA	102%		50-150%
	13C6-PFDA	83%		50-150%
	13C7-PFUnDA	78%		40-140%
	13C2-PFDoDA	71%		40-140%
	13C2-PFTeDA	59%		30-130%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	80%		50-150%
	13C8-PFOS	77%		50-150%
	13C8-FOSA	63%		30-130%
	d3-MeFOSAA	87%		50-150%
	13C2-4:2FTS	93%		50-150%
	13C2-6:2FTS	95%		50-150%
	13C2-8:2FTS	85%		50-150%
	13C3-HFPO-DA	91%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-01		
Lab Sample ID:	FA77230-9	**Date Sampled:**	07/20/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q52172.D	1	08/03/20 18:44	NAF	07/31/20 10:30	OP81355	S2Q776
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0242	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0535	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	0.0508	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0502	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0986	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0132	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0104	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0016	0.0040	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0461	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	0.0014	0.0040	0.0010	ug/l	J
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-01		
Lab Sample ID:	FA77230-9	**Date Sampled:**	07/20/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.020	0.0050	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	85%		35-135%
	13C5-PFPeA	84%		50-150%
	13C5-PFHxA	82%		50-150%
	13C4-PFHpA	83%		50-150%
	13C8-PFOA	89%		50-150%
	13C9-PFNA	100%		50-150%
	13C6-PFDA	80%		50-150%
	13C7-PFUnDA	81%		40-140%
	13C2-PFDoDA	72%		40-140%
	13C2-PFTeDA	49%		30-130%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	78%		50-150%
	13C8-PFOS	75%		50-150%
	13C8-FOSA	53%		30-130%
	d3-MeFOSAA	87%		50-150%
	13C2-4:2FTS	87%		50-150%
	13C2-6:2FTS	96%		50-150%
	13C2-8:2FTS	87%		50-150%
	13C3-HFPO-DA	89%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P2-NV170_6-11		
Lab Sample ID:	FA77230-10	**Date Sampled:**	07/23/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q52175.D	1	08/03/20 19:28	NAF	07/31/20 10:30	OP81355	S2Q776
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0128	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0193	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	0.0174	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0144	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0288	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0035	0.0040	0.0010	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0021	0.0040	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0047	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0073	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0627	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0047	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.137	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0029	0.0080	0.0020	ug/l	J

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: VAP-P2-NV170_6-11
Lab Sample ID: FA77230-10
Matrix: AQ - Ground Water
Method: EPA 537M BY ID EPA 537 MOD
Project: Racer Lansing PFAS Delineation; Lansing, MI

Date Sampled: 07/23/20
Date Received: 07/28/20
Percent Solids: n/a

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.020	0.0050	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	89%		35-135%
	13C5-PFPeA	85%		50-150%
	13C5-PFHxA	87%		50-150%
	13C4-PFHpA	85%		50-150%
	13C8-PFOA	94%		50-150%
	13C9-PFNA	102%		50-150%
	13C6-PFDA	85%		50-150%
	13C7-PFUnDA	83%		40-140%
	13C2-PFDoDA	82%		40-140%
	13C2-PFTeDA	74%		30-130%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	78%		50-150%
	13C8-PFOS	78%		50-150%
	13C8-FOSA	77%		30-130%
	d3-MeFOSAA	92%		50-150%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	103%		50-150%
	13C2-8:2FTS	90%		50-150%
	13C3-HFPO-DA	89%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P2-NV170_18.5-23.5		
Lab Sample ID:	FA77230-11	**Date Sampled:**	07/23/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q52176.D	1	08/03/20 19:43	NAF	07/31/20 10:30	OP81355	S2Q776
Run #2 [a]	2Q52240.D	5	08/04/20 16:59	NAF	07/31/20 10:30	OP81355	S2Q777

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0183	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0170	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	0.0210	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0151	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0297	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0031	0.0040	0.0010	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0025	0.0040	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.180	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0164	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0238	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0025	0.0040	0.0010	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0454	0.0040	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.020	0.0050	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P2-NV170_18.5-23.5		
Lab Sample ID:	FA77230-11	**Date Sampled:**	07/23/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.020	0.0050	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	62%	85%	35-135%
	13C5-PFPeA	61%	84%	50-150%
	13C5-PFHxA	58%	82%	50-150%
	13C4-PFHpA	60%	79%	50-150%
	13C8-PFOA	66%	85%	50-150%
	13C9-PFNA	78%	85%	50-150%
	13C6-PFDA	70%	82%	50-150%
	13C7-PFUnDA	70%	76%	40-140%
	13C2-PFDoDA	66%	73%	40-140%
	13C2-PFTeDA	69%	69%	30-130%
	13C3-PFBS	64%	87%	50-150%
	13C3-PFHxS	68%	83%	50-150%
	13C8-PFOS	71%	90%	50-150%
	13C8-FOSA	19% [c]	38%	30-130%
	d3-MeFOSAA	79%	99%	50-150%
	13C2-4:2FTS	74%	85%	50-150%
	13C2-6:2FTS	85%	94%	50-150%
	13C2-8:2FTS	92%	95%	50-150%
	13C3-HFPO-DA	67%	81%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P6-OL211_1-6		
Lab Sample ID:	FA77230-12	**Date Sampled:**	07/23/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q52177.D	1	08/03/20 19:57	NAF	07/31/20 10:30	OP81355	S2Q776
Run #2							

	Initial Volume	Final Volume
Run #1	220 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0219	0.0091	0.0023	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0057	0.0045	0.0017	ug/l	
307-24-4	Perfluorohexanoic acid	0.0052	0.0045	0.0011	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0042	0.0045	0.0011	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0057	0.0045	0.0011	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0045	0.0011	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0045	0.0011	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0045	0.0011	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0045	0.0017	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0045	0.0011	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0045	0.0011	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0021	0.0045	0.0011	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0045	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0045	0.0011	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0045	0.0011	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0030	0.0045	0.0017	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0045	0.0011	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0045	0.0011	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0045	0.0011	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0091	0.0045	ug/l	
2991-50-6	EtFOSAA	ND	0.0091	0.0045	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P6-OL211_1-6		
Lab Sample ID:	FA77230-12	**Date Sampled:**	07/23/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.023	0.0057	ug/l	
919005-14-4	ADONA	ND	0.0091	0.0023	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0091	0.0023	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0091	0.0023	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	91%		35-135%
	13C5-PFPeA	87%		50-150%
	13C5-PFHxA	85%		50-150%
	13C4-PFHpA	82%		50-150%
	13C8-PFOA	86%		50-150%
	13C9-PFNA	94%		50-150%
	13C6-PFDA	74%		50-150%
	13C7-PFUnDA	68%		40-140%
	13C2-PFDoDA	65%		40-140%
	13C2-PFTeDA	47%		30-130%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	77%		50-150%
	13C8-PFOS	72%		50-150%
	13C8-FOSA	73%		30-130%
	d3-MeFOSAA	71%		50-150%
	13C2-4:2FTS	83%		50-150%
	13C2-6:2FTS	84%		50-150%
	13C2-8:2FTS	70%		50-150%
	13C3-HFPO-DA	88%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P6-OL211_33-38		
Lab Sample ID:	FA77230-13	**Date Sampled:**	07/23/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q52178.D	1	08/03/20 20:12	NAF	07/31/20 10:30	OP81355	S2Q776
Run #2							

	Initial Volume	Final Volume
Run #1	220 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0091	0.0023	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0045	0.0017	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0045	0.0011	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0045	0.0011	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0045	0.0011	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0045	0.0011	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0045	0.0011	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0045	0.0011	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0045	0.0017	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0045	0.0011	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0045	0.0011	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0045	0.0011	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0045	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0045	0.0011	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0045	0.0011	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0045	0.0017	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0045	0.0011	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0045	0.0011	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0045	0.0011	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0091	0.0045	ug/l	
2991-50-6	EtFOSAA	ND	0.0091	0.0045	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P6-OL211_33-38		
Lab Sample ID:	FA77230-13	**Date Sampled:**	07/23/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.023	0.0057	ug/l	
919005-14-4	ADONA	ND	0.0091	0.0023	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0091	0.0023	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0091	0.0023	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	84%		35-135%
	13C5-PFPeA	89%		50-150%
	13C5-PFHxA	89%		50-150%
	13C4-PFHpA	92%		50-150%
	13C8-PFOA	95%		50-150%
	13C9-PFNA	110%		50-150%
	13C6-PFDA	84%		50-150%
	13C7-PFUnDA	74%		40-140%
	13C2-PFDoDA	74%		40-140%
	13C2-PFTeDA	50%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	88%		50-150%
	13C8-PFOS	81%		50-150%
	13C8-FOSA	76%		30-130%
	d3-MeFOSAA	79%		50-150%
	13C2-4:2FTS	87%		50-150%
	13C2-6:2FTS	93%		50-150%
	13C2-8:2FTS	80%		50-150%
	13C3-HFPO-DA	100%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-20-130_072320		
Lab Sample ID:	FA77230-14	**Date Sampled:**	07/23/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q52179.D	1	08/03/20 20:27	NAF	07/31/20 10:30	OP81355	S2Q776
Run #2							

	Initial Volume	Final Volume
Run #1	260 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0061	0.0077	0.0019	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0016	0.0038	0.0014	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0023	0.0038	0.00096	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0038	0.00096	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0038	0.00096	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0038	0.00096	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0038	0.00096	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0038	0.00096	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0038	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0038	0.00096	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0038	0.00096	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0101	0.0038	0.00096	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0038	0.00096	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0038	0.00096	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0038	0.00096	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0038	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0038	0.00096	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0038	0.00096	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0038	0.00096	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0077	0.0038	ug/l	
2991-50-6	EtFOSAA	ND	0.0077	0.0038	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-20-130_072320		
Lab Sample ID:	FA77230-14	**Date Sampled:**	07/23/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.019	0.0048	ug/l	
919005-14-4	ADONA	ND	0.0077	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0077	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0077	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	83%		50-150%
	13C5-PFHxA	82%		50-150%
	13C4-PFHpA	84%		50-150%
	13C8-PFOA	87%		50-150%
	13C9-PFNA	101%		50-150%
	13C6-PFDA	77%		50-150%
	13C7-PFUnDA	72%		40-140%
	13C2-PFDoDA	68%		40-140%
	13C2-PFTeDA	63%		30-130%
	13C3-PFBS	79%		50-150%
	13C3-PFHxS	79%		50-150%
	13C8-PFOS	78%		50-150%
	13C8-FOSA	83%		30-130%
	d3-MeFOSAA	74%		50-150%
	13C2-4:2FTS	85%		50-150%
	13C2-6:2FTS	90%		50-150%
	13C2-8:2FTS	75%		50-150%
	13C3-HFPO-DA	87%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P2-OP164_10-15		
Lab Sample ID:	FA77230-15	**Date Sampled:**	07/24/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q52454.D	1	08/07/20 17:55	NAF	08/06/20 13:30	OP81430	S2Q780
Run #2							

	Initial Volume	Final Volume
Run #1	260 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0781	0.0077	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0294	0.0038	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	0.0228	0.0038	0.00096	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0086	0.0038	0.00096	ug/l	
335-67-1	Perfluorooctanoic acid	0.0214	0.0038	0.00096	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0038	0.00096	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0038	0.00096	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0038	0.00096	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0038	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0038	0.00096	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0038	0.00096	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0038	0.00096	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0038	0.00096	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0063	0.0038	0.00096	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0038	0.00096	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0020	0.0038	0.0014	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0038	0.00096	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0038	0.00096	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0038	0.00096	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0077	0.0038	ug/l	
2991-50-6	EtFOSAA	ND	0.0077	0.0038	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0064	0.0077	0.0019	ug/l	J

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P2-OP164_10-15		
Lab Sample ID:	FA77230-15	**Date Sampled:**	07/24/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%		35-135%
	13C5-PFPeA	63%		50-150%
	13C5-PFHxA	67%		50-150%
	13C4-PFHpA	69%		50-150%
	13C8-PFOA	79%		50-150%
	13C9-PFNA	81%		50-150%
	13C6-PFDA	80%		50-150%
	13C7-PFUnDA	78%		40-140%
	13C2-PFDoDA	77%		40-140%
	13C2-PFTeDA	72%		30-130%
	13C3-PFBS	73%		50-150%
	13C3-PFHxS	79%		50-150%
	13C8-PFOS	81%		50-150%
	13C8-FOSA	46%		30-130%
	d3-MeFOSAA	70%		50-150%
	13C2-4:2FTS	69%		50-150%
	13C2-6:2FTS	81%		50-150%
	13C2-8:2FTS	80%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P2-OP164_27-32		
Lab Sample ID:	FA77230-16	**Date Sampled:**	07/24/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q52181.D	1	08/03/20 20:56	NAF	07/31/20 10:30	OP81355	S2Q776
Run #2	2Q52455.D	1.2	08/07/20 18:10	NAF	08/06/20 13:30	OP81430	S2Q780

	Initial Volume	Final Volume
Run #1	260 ml	1.0 ml
Run #2	270 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid [a]	0.0289	0.0077	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0036	0.0038	0.0014	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0028	0.0038	0.00096	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0019	0.0038	0.00096	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0089	0.0038	0.00096	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0038	0.00096	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0038	0.00096	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0038	0.00096	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0038	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0038	0.00096	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0038	0.00096	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND [b]	0.0044	0.0011	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND [b]	0.0044	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0017	0.0038	0.00096	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0038	0.00096	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0043	0.0038	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0038	0.00096	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0038	0.00096	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.0044	0.0011	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0077	0.0038	ug/l	
2991-50-6	EtFOSAA	ND	0.0077	0.0038	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0043	0.0077	0.0019	ug/l	J

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P2-OP164_27-32		
Lab Sample ID:	FA77230-16	**Date Sampled:**	07/24/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.019	0.0048	ug/l	
919005-14-4	ADONA	ND	0.0077	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0077	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0077	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	18% [d]	15% [c]	35-135%
	13C5-PFPeA	72%	81%	50-150%
	13C5-PFHxA	61%	71%	50-150%
	13C4-PFHpA	72%	80%	50-150%
	13C8-PFOA	82%	92%	50-150%
	13C9-PFNA	91%	91%	50-150%
	13C6-PFDA	81%	95%	50-150%
	13C7-PFUnDA	76%	82%	40-140%
	13C2-PFDoDA	63%	60%	40-140%
	13C2-PFTeDA	50%	59%	30-130%
	13C3-PFBS	73%	85%	50-150%
	13C3-PFHxS	72%	92%	50-150%
	13C8-PFOS	73%	93%	50-150%
	13C8-FOSA	59%	54%	30-130%
	d3-MeFOSAA	77%	95%	50-150%
	13C2-4:2FTS	83%	82%	50-150%
	13C2-6:2FTS	95%	99%	50-150%
	13C2-8:2FTS	93%	105%	50-150%
	13C3-HFPO-DA	76%	83%	50-150%

(a) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
(b) Result is from Run# 2
(c) Outside control limits.
(d) Outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P2-PP185_19-24		
Lab Sample ID:	FA77230-17	**Date Sampled:**	07/24/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q52539.D	1	08/09/20 18:57	NAF	08/07/20 08:30	OP81449	S2Q781
Run #2							

	Initial Volume	Final Volume
Run #1	260 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0041	0.0077	0.0019	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0038	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0038	0.00096	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0038	0.00096	ug/l	
335-67-1	Perfluorooctanoic acid	0.0016	0.0038	0.00096	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0038	0.00096	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0038	0.00096	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0038	0.00096	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0038	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0038	0.00096	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0038	0.00096	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0038	0.00096	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0038	0.00096	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0038	0.00096	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0038	0.00096	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0038	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0038	0.00096	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0038	0.00096	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0038	0.00096	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0077	0.0038	ug/l	
2991-50-6	EtFOSAA	ND	0.0077	0.0038	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	VAP-P2-PP185_19-24		
Lab Sample ID:	FA77230-17	**Date Sampled:**	07/24/20
Matrix:	AQ - Ground Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.019	0.0048	ug/l	
919005-14-4	ADONA	ND	0.0077	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0077	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0077	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	87%		35-135%
	13C5-PFPeA	83%		50-150%
	13C5-PFHxA	86%		50-150%
	13C4-PFHpA	85%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	91%		50-150%
	13C6-PFDA	90%		50-150%
	13C7-PFUnDA	87%		40-140%
	13C2-PFDoDA	81%		40-140%
	13C2-PFTeDA	73%		30-130%
	13C3-PFBS	92%		50-150%
	13C3-PFHxS	102%		50-150%
	13C8-PFOS	95%		50-150%
	13C8-FOSA	91%		30-130%
	d3-MeFOSAA	75%		50-150%
	13C2-4:2FTS	86%		50-150%
	13C2-6:2FTS	91%		50-150%
	13C2-8:2FTS	88%		50-150%
	13C3-HFPO-DA	91%		50-150%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB_072420		
Lab Sample ID:	FA77230-18	**Date Sampled:**	07/24/20
Matrix:	AQ - Field Blank Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q24683.D	1	08/05/20 02:13	NG	08/01/20 12:30	OP81352	S3Q375
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0071	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0036	0.0013	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0036	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0036	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0036	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0036	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0036	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0036	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0036	0.0013	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0036	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0036	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0036	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0036	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0036	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0036	0.0013	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0036	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0071	0.0036	ug/l	
2991-50-6	EtFOSAA	ND	0.0071	0.0036	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB_072420		
Lab Sample ID:	FA77230-18	**Date Sampled:**	07/24/20
Matrix:	AQ - Field Blank Water	**Date Received:**	07/28/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.018	0.0045	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	101%		35-135%
	13C5-PFPeA	100%		50-150%
	13C5-PFHxA	101%		50-150%
	13C4-PFHpA	103%		50-150%
	13C8-PFOA	102%		50-150%
	13C9-PFNA	102%		50-150%
	13C6-PFDA	107%		50-150%
	13C7-PFUnDA	103%		40-140%
	13C2-PFDoDA	92%		40-140%
	13C2-PFTeDA	87%		30-130%
	13C3-PFBS	102%		50-150%
	13C3-PFHxS	102%		50-150%
	13C8-PFOS	102%		50-150%
	13C8-FOSA	99%		30-130%
	d3-MeFOSAA	93%		50-150%
	13C2-4:2FTS	96%		50-150%
	13C2-6:2FTS	102%		50-150%
	13C2-8:2FTS	102%		50-150%
	13C3-HFPO-DA	110%		50-150%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA77230
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	SO	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	SO	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	SO	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	SO	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	SO	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	SO	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	SO	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	SO	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	SO	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	SO	Certified by SOP MS014

Parameter Certification Exceptions

Job Number: FA77230
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	SO	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

SGS North America Inc - Orlando

Chain of Custody

SGS FA77230

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # : PAGE 1 OF 2

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Alex Villhauer Email: Alex.Villhauer@arcadis.com
Phone #: 616-780-3277
Sampler(s) Name(s) (Printed)
Sampler 1: Austin Westhuis Sampler 2: Kevin Donahue

Project Information

Project Name: MCER Lansing PFAS Delineation
Street: 2800 W Saginaw Street
City: Lansing State: MI
Project #: 30042872.03100
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via mod. 4d USEPA Method 537 w/ isotope dilution

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZnAc	DI WATER	MeOH	PFAS via mod. 4d USEPA Method 537 w/ isotope dilution	LAB USE ONLY
1	SB-P2-OM185_0.6-1	7/14/20	1415	AW	S	1		X								X	
2	SB-P2-OM185_9-9.5	7/14/20	1420	AW	S	1		X								X	
3	SB-P2-OM185_19.5-20	7/14/20	1425	AW	S	1		X								X	
4	SB-P2-OM185_31-31.5	7/14/20	1430	AW	S	1		X								X	
5	SB-P2-OM185_41-41.5	7/17/20	1415	AW	S	1		X								X	
6	SB-P2-OM185_52-52.5	7/17/20	1435	AW	S	1		X								X	
7	SB-P2-OM185_59.5-60	7/17/20	1455	AW	S	1		X								X	
8	VAP-P6-PG211_4-9	7/20/20	1543	KD	GW	2		X								X	
9	DUP-01	—	—	KD	GW	2		X								X	
10	VAP-P2-NV170_6-11	7/23/20	0828	KD	GW	2		X								X	
11	VAP-P2-NV170_18.5-23.5	7/23/20	0836	KD	GW	2		X								X	
12	VAP-P6-DL211_1-6	7/23/20	1413	KD	GW	2		X								X	

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

* Please analyze for the 28 PFAS outlined in the Michigan Department of Environment, Great Lakes, and Energy (EGLE) PFAS Minimum Laboratory Analyte List (EGLE 2019) using modified USEPA Method 537 with isotope dilution

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1	Kevin Donahue/Arcadis	7/24/20 1745	2 FedEx	3	9:45	4 07/25/20
5	Relinquished by/Affiliation	Date Time:	Received By/Affiliation 6	Relinquished By/Affiliation 7	Date Time:	Received By/Affiliation 8

Lab Use Only: Cooler Temperature (s) Celsius (corrected): 1.0

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

SGS North America Inc - Orlando

Chain of Custody

SGS FA77230

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
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www.sgs.com

SGS - ORLANDO JOB # :

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SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis
Address: 28550 Cabot Dr., Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Alex Villhauer Email: Alex.Villhauer@arcadis.com
Phone #: 616-780-3277
Sampler(s) Name(s) (Printed)
Sampler 1: Kara Donahue Sampler 2: Anyssa Mandich

Project Information

Project Name: RACER Lansing PFAS Delineation
Street: 2800 W Saginaw St.
City: Lansing State: MI
Project #: 30042872.03100
Fax #: 248-994-2241
Client Purchase Order #

Analytical Information

PFAS via modified USEPA Method 537 w/isotope dilution

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	CONTAINER INFORMATION: OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZnAc	DI WATER	MEOH	LAB USE ONLY
13	VAP-PP-072120_33-38	7/23/20	1445	KD	GW	2		X							X	
14	MW-20-130_072320	7/23/20	1750	AM	GW	2		X							X	
15	VAP-P2-OP164_10-15	7/24/20	1353	KD	GW	2		X							X	
16	VAP-P2-OP164_27-32	7/24/20	1410	KD	GW	2		X							X	
17	VAP-P2-PP185_19-24	7/24/20	1445	KD	GW	2		X							X	
KD	Trip Blank	7/24/20														
18	FB-072420	7/24/20	1610	KD	WW	2		X							X	

FOI ADDITIONAL

LEVEL VERIFICATION

Turnaround Time (Business days)

10 Day (Business)
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other

Approved By: / Date:

Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

*Please analyze for the 28 PFAS outlined in the Michigan Dept. of Environment Great Lakes, and Energy (EGLE) PFAS minimum Laboratory Analyte List (EGLE 2019) using modified USEPA Method 537 with isotope dilution

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1	Kara Donahue / Arcadis	7/24/20 1445	2 FedEx	3	9:45	4 07/28/20
5	Relinquished by/Affiliation	Date Time:	Received By/Affiliation 6	Relinquished By/Affiliation 7	Date Time:	Received By/Affiliation 8

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 1.6

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

SGS Sample Receipt Summary

Job Number: FA77230 **Client:** ARCADIS **Project:** RACER LANSING PFAS DELINEATION

Date / Time Received: 7/28/2020 9:45:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 1002284323770003281100138666005237

Therm ID: IR 1; **Therm CF:** -0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (0.8);

Cooler Temps (Corrected) °C: Cooler 1: (0.6);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: AKARIG Date: 7/28/2020 9:45:00 AM Reviewer: _____ Date: _____

FA77230: Chain of Custody
Page 3 of 3

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403
Tel: (802)660-1990

Laboratory Job ID: 200-56406-1
Client Project/Site: Racer Lansing

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Tiffany Linder

Authorized for release by:
12/14/2020 3:32:15 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 200-56406-1

Laboratory: Eurofins TestAmerica, Burlington

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Racer Lansing

Report Number: 200-56406-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Burlington attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 12/8/2020 10:30 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.4º C.

1,4-DIOXANE

Samples FB-01_120720 (200-56406-1), TWP-90-04_120720 (200-56406-2), TWP-90-05_120720 (200-56406-3) and DUP-08-120720 (200-56406-4) were analyzed for 1,4-Dioxane in accordance with EPA Method 522. The samples were prepared on 12/08/2020 and analyzed on 12/10/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Client Sample ID: FB-01_120720 — Lab Sample ID: 200-56406-1

No Detections.

Client Sample ID: TWP-90-04_120720 — Lab Sample ID: 200-56406-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.21		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: TWP-90-05_120720 — Lab Sample ID: 200-56406-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.41		0.20	0.073	ug/L	1		522	Total/NA

Client Sample ID: DUP-08-120720 — Lab Sample ID: 200-56406-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.22		0.20	0.073	ug/L	1		522	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FB-01_120720

Lab Sample ID: 200-56406-1

Date Collected: 12/07/20 08:45

Matrix: Water

Date Received: 12/08/20 10:30

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		12/08/20 19:35	12/10/20 10:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*95*		*46 - 130*	*12/08/20 19:35*	*12/10/20 10:15*	*1*

Client Sample ID: TWP-90-04_120720

Lab Sample ID: 200-56406-2

Date Collected: 12/07/20 08:50

Matrix: Water

Date Received: 12/08/20 10:30

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.21**		0.20	0.073	ug/L		12/08/20 19:35	12/10/20 10:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*91*		*46 - 130*	*12/08/20 19:35*	*12/10/20 10:29*	*1*

Client Sample ID: TWP-90-05_120720

Lab Sample ID: 200-56406-3

Date Collected: 12/07/20 09:05

Matrix: Water

Date Received: 12/08/20 10:30

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.41**		0.20	0.073	ug/L		12/08/20 19:35	12/10/20 10:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*96*		*46 - 130*	*12/08/20 19:35*	*12/10/20 10:42*	*1*

Client Sample ID: DUP-08-120720

Lab Sample ID: 200-56406-4

Date Collected: 12/07/20 09:05

Matrix: Water

Date Received: 12/08/20 10:30

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.22**		0.20	0.073	ug/L		12/08/20 19:35	12/10/20 10:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*97*		*46 - 130*	*12/08/20 19:35*	*12/10/20 10:55*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		DXE
Lab Sample ID	Client Sample ID	(46-130)
200-56406-1	FB-01_120720	95
200-56406-2	TWP-90-04_120720	91
200-56406-3	TWP-90-05_120720	96
200-56406-4	DUP-08-120720	97
LCS 200-161867/2-A	Lab Control Sample	96
LCSD 200-161867/3-A	Lab Control Sample Dup	100
MB 200-161867/1-A	Method Blank	100

Surrogate Legend

DXE = 1,4-Dioxane-d8 (Surr)

Method: 522 - 1,4 Dioxane (GC/MS SIM)

Lab Sample ID: MB 200-161867/1-A
Matrix: Water
Analysis Batch: 161927

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 161867

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.073	ug/L		12/08/20 19:35	12/10/20 10:02	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8 (Surr)	*100*		*46 - 130*	*12/08/20 19:35*	*12/10/20 10:02*	*1*

Lab Sample ID: LCS 200-161867/2-A
Matrix: Water
Analysis Batch: 161927

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 161867

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			8.00	7.85		ug/L		98	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*96*		*46 - 130*

Lab Sample ID: LCSD 200-161867/3-A
Matrix: Water
Analysis Batch: 161927

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 161867

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane			8.00	8.21		ug/L		103	70 - 130	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,4-Dioxane-d8 (Surr)	*100*		*46 - 130*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

GC/MS Semi VOA

Prep Batch: 161867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
200-56406-1	FB-01_120720	Total/NA	Water	522	
200-56406-2	TWP-90-04_120720	Total/NA	Water	522	
200-56406-3	TWP-90-05_120720	Total/NA	Water	522	
200-56406-4	DUP-08-120720	Total/NA	Water	522	
MB 200-161867/1-A	Method Blank	Total/NA	Water	522	
LCS 200-161867/2-A	Lab Control Sample	Total/NA	Water	522	
LCSD 200-161867/3-A	Lab Control Sample Dup	Total/NA	Water	522	

Analysis Batch: 161927

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
200-56406-1	FB-01_120720	Total/NA	Water	522	161867
200-56406-2	TWP-90-04_120720	Total/NA	Water	522	161867
200-56406-3	TWP-90-05_120720	Total/NA	Water	522	161867
200-56406-4	DUP-08-120720	Total/NA	Water	522	161867
MB 200-161867/1-A	Method Blank	Total/NA	Water	522	161867
LCS 200-161867/2-A	Lab Control Sample	Total/NA	Water	522	161867
LCSD 200-161867/3-A	Lab Control Sample Dup	Total/NA	Water	522	161867

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Client Sample ID: FB-01_120720

Lab Sample ID: 200-56406-1
Matrix: Water
Date Collected: 12/07/20 08:45
Date Received: 12/08/20 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			161867	12/08/20 19:35	EK	TAL BUR
Total/NA	Analysis	522		1	161927	12/10/20 10:15	K1P	TAL BUR

Client Sample ID: TWP-90-04_120720

Lab Sample ID: 200-56406-2
Matrix: Water
Date Collected: 12/07/20 08:50
Date Received: 12/08/20 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			161867	12/08/20 19:35	EK	TAL BUR
Total/NA	Analysis	522		1	161927	12/10/20 10:29	K1P	TAL BUR

Client Sample ID: TWP-90-05_120720

Lab Sample ID: 200-56406-3
Matrix: Water
Date Collected: 12/07/20 09:05
Date Received: 12/08/20 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			161867	12/08/20 19:35	EK	TAL BUR
Total/NA	Analysis	522		1	161927	12/10/20 10:42	K1P	TAL BUR

Client Sample ID: DUP-08-120720

Lab Sample ID: 200-56406-4
Matrix: Water
Date Collected: 12/07/20 09:05
Date Received: 12/08/20 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	522			161867	12/08/20 19:35	EK	TAL BUR
Total/NA	Analysis	522		1	161927	12/10/20 10:55	K1P	TAL BUR

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Laboratory: Eurofins TestAmerica, Burlington

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2336	02-25-23
Connecticut	State	PH-0751	09-30-21
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	05-16-21
Florida	NELAP	E87467	06-30-21
Minnesota	NELAP	050-999-436	12-31-21
New Hampshire	NELAP	2006	12-18-20
New Jersey	NELAP	VT972	06-30-21
New York	NELAP	10391	04-01-21
Pennsylvania	NELAP	68-00489	04-30-21
Rhode Island	State	LAO00298	12-30-20
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-17-00272	10-30-23
Vermont	State	VT4000	12-31-20
Virginia	NELAP	460209	12-14-20
Wisconsin	State	399133350	08-31-21

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Method	Method Description	Protocol	Laboratory
522	1,4 Dioxane (GC/MS SIM)	EPA	TAL BUR
522	Solid-Phase Extraction (SPE)	EPA	TAL BUR

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Racer Lansing

Job ID: 200-56406-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
200-56406-1	FB-01_120720	Water	12/07/20 08:45	12/08/20 10:30	
200-56406-2	TWP-90-04_120720	Water	12/07/20 08:50	12/08/20 10:30	
200-56406-3	TWP-90-05_120720	Water	12/07/20 09:05	12/08/20 10:30	
200-56406-4	DUP-08-120720	Water	12/07/20 09:05	12/08/20 10:30	

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler:	Lab PM: DelMonico, Michael	Carrier Tracking No(s):	COC No: 240-77309-30848.1
Client Contact: Alex Villhauer	Phone:	E-Mail: Michael.DelMonico@Eurofinset.com	State of Origin:	Page: Page 1 of 1
Company: ARCADIS U.S., Inc.	PWSID:			Job #:

Address: 300 South Washington Square Suite 315	Due Date Requested:
City: Lansing	TAT Requested (days):
State, Zip: MI, 48933	Compliance Project: Δ Yes Δ No
Phone: 810-225-1928(Tel)	PO #: Purchase Order not required
Email: alex.villhauer@arcadis.com	WO #: Project #: B0064607.2016.00001
Project Name: Racer Lansing method 522	Project #: 24017406
Site:	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	522 - 522-1,4-Dioxane	522 - Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	A		
FB-01_120720	12/7/20	8:45	GRAB	Water	N	N	X	X		
TWP-90-04_120720	12/7/20	8:50	GRAB	Water	N	N	X	X		
TWP-90-05_120720	12/7/20	9:05	GRAB	Water	N	N	X	X		
Dup-08_120720	12/7/20	—	GRAB	Water	N	N	X	X		
				Water						
				Water						

200-56406 COC

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 12/7/20 11:30	Company ARCADIS	Received by: Taylor Whitehouse	Date/Time: 12/8/2020 1030	Company EMAB
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.: 1436564	Cooler Temperature(s) °C and Other Remarks: 3.4

Ver: 11/01/2020

FedEx Express Package US Airbill

FedEx Tracking Number 8148 4562 2658

0200 Recipient's Copy

1 From

Date 12-7-20

Sender's Name KAITLYN VOET Phone 810 305 3642

Company ARCADIS

Address 28550 CABOT DR STE 500 Dept/Floor/Suite/Room

City NOVI State MI ZIP 48377

2 Your Internal Billing Reference 30042872 · 04700

3 To

Recipient's Name SAMPLE RECEIVING Phone [illegible]0.1440

Company TEST AMERICA

Address 30 COMMERCE DRIVE SUITE 11 Dept/Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

Use this line for the HOLD location address or for continuation of your shipping address.

City SOUTH BURLINGTON State VT ZIP 05403-6809

☐ Hold Weekday — FedEx location address REQUIRED. NOT available for FedEx First Overnight.

☐ Hold Saturday — FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

8148 4562 2658

4 Express Package Service * To most locations. Packages up to 150 lbs. For packages over 150 lbs., use the FedEx Express Freight US Airbill.

Next Business Day

☐ FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless Saturday Delivery is selected.

☐ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless Saturday Delivery is selected.

☒ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days

☐ FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.

☐ FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless Saturday Delivery is selected.

☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging * Declared value limit $500.

☐ FedEx Envelope* ☐ FedEx Pak* ☐ FedEx Box ☐ FedEx Tube ☒ Other

6 Special Handling and Delivery Signature Options Fees may apply. See the FedEx Service Guide.

☐ Saturday Delivery — NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

☐ No Signature Required — Package may be left without obtaining a signature for delivery.

☐ Direct Signature — Someone at recipient's address may sign for delivery.

☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only.

Does this shipment contain dangerous goods? One box must be checked.

☒ No ☐ Yes As per attached Shipper's Declaration. ☐ Yes Shipper's Declaration not required. ☐ Dry Ice Dry Ice, 9, UN 1845 ____ x ____ kg

Restrictions apply for dangerous goods — see the current FedEx Service Guide. ☐ Cargo Aircraft Only

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. ☐

☒ Sender Acct. No. in Section 1 will be billed. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

Total Packages Total Weight lbs. Credit Card Auth.

644

*Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

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fedex.com 1.800.GoFedEx 1.800.463.3339

fedex.com 1.800.GoFedEx 1.800.463.3339

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 200-56406-1

Login Number: 56406
List Number: 1
Creator: Jaffe, Nat S

List Source: Eurofins TestAmerica, Burlington

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	1436564
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.4ºC
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Analytical Laboratory Report

Report ID: S19474.01(01)+QC01
Generated on 12/03/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19474.01
Project: 30042872.00102 / RACER Lansing
Collected Date(s): 11/24/2020
Submitted Date/Time: 11/24/2020 14:50
Sampled by: Austin Westhuis
P.O. #: 30042872.00102

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003

Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19474.01	SVMP-20-01(5-10)	Groundwater	11/24/20 11:30

Lab Sample ID: S19474.01
Sample Tag: SVMP-20-01(5-10)
Collected Date/Time: 11/24/2020 11:30
Matrix: Groundwater
COC Reference: 128248

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/01/20 09:35	JML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/01/20 00:09, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	3	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	4	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S19474.01 (continued)
Sample Tag: SVMP-20-01(5-10)

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/01/20 00:09, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Quality Control Report

Report ID: S19474.01(01)+QC01
Generated on 12/03/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19474.01
Project: 30042872.00102 / RACER Lansing
Submitted Date/Time: 11/24/2020 14:50
Sampled by: Austin Westhuis
P.O. #: 30042872.00102

QC Report Sections

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Analysis Summary (Page 9)
Prep Batch Summary (Page 10)
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Surrogates per QC Sample (Page 12)
Internal Standards per Lab Sample (Page 13)
Internal Standards per QC Sample (Page 14)
Batch QC Results (Pages 15-20)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S19474.01
Sample Tag: SVMP-20-01(5-10)
Collected Date/Time: 11/24/2020 11:30
Matrix: Groundwater
COC Reference: 128248

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	12/01/20 00:09	201130B7	VF201130W3	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF201130W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19474.01	Volatile Organics - DEQ List	SW5030C/8260C	12/01/20 00:09	201130B7

QC Report - Surrogates per Lab Sample

Lab Sample ID: S19474.01

Sample Tag: SVMP-20-01(5-10)

Collected Date/Time: 11/24/2020 11:30

Matrix: Groundwater

COC Reference: 128248

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201130B7, Run Date: 12/01/2020 00:09, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**102.3**	80.0	124.0
1,2-Dichloroethane-D4		**103.0**	72.0	125.0
Toluene-D8		**100.6**	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF201130W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201130B7.BLKW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 23:22, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**101.6**	80.0	124.0
1,2-Dichloroethane-D4		**94.3**	72.0	125.0
Toluene-D8		**99.5**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201130B7.LCSW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 21:27, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.1**	80.0	124.0
1,2-Dichloroethane-D4		**109.3**	72.0	125.0
Toluene-D8		**102.3**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201130B7.LCSDW30C, Parent Sample ID: 201130B7.LCSW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 21:50, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.2**	80.0	124.0
1,2-Dichloroethane-D4		**110.3**	72.0	125.0
Toluene-D8		**101.9**	89.0	112.0

Matrix Spike (MS)

Lab Sample ID: 201130B7.1935609M, Parent Sample ID: S19356.08

Run in Batch: 201130B7, Run Date: 11/30/2020 22:13, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**99.9**	80.0	124.0
1,2-Dichloroethane-D4		**104.7**	72.0	125.0
Toluene-D8		**100.7**	89.0	112.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201130B7.1935610N, Parent Sample ID: 201130B7.1935609M

Run in Batch: 201130B7, Run Date: 11/30/2020 22:36, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**100.2**	80.0	124.0
1,2-Dichloroethane-D4		**97.9**	72.0	125.0
Toluene-D8		**100.5**	89.0	112.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19474.01

Sample Tag: SVMP-20-01(5-10)

Collected Date/Time: 11/24/2020 11:30

Matrix: Groundwater

COC Reference: 128248

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201130B7, Run Date: 12/01/2020 00:09, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**104.8**	50.0	200.0
1,4-Difluorobenzene		**99.3**	50.0	200.0
Chlorobenzene-D5		**99.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**102.8**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF201130W3

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201130B7.BLKW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 23:22, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**103.4**	50.0	200.0
1,4-Difluorobenzene		**98.3**	50.0	200.0
Chlorobenzene-D5		**95.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.9**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201130B7.LCSW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 21:27, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**101.9**	50.0	200.0
1,4-Difluorobenzene		**101.0**	50.0	200.0
Chlorobenzene-D5		**101.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.2**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201130B7.LCSDW30C, Parent Sample ID: 201130B7.LCSW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 21:50, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**99.8**	50.0	200.0
1,4-Difluorobenzene		**98.2**	50.0	200.0
Chlorobenzene-D5		**97.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.4**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 201130B7.1935609M, Parent Sample ID: S19356.08

Run in Batch: 201130B7, Run Date: 11/30/2020 22:13, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**99.8**	50.0	200.0
1,4-Difluorobenzene		**98.2**	50.0	200.0
Chlorobenzene-D5		**96.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.1**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201130B7.1935610N, Parent Sample ID: 201130B7.1935609M

Run in Batch: 201130B7, Run Date: 11/30/2020 22:36, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**101.3**	50.0	200.0
1,4-Difluorobenzene		**98.7**	50.0	200.0
Chlorobenzene-D5		**97.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.2**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF201130W3

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201130B7.BLKW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 23:22, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF201130W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK) (continued)

Lab Sample ID: 201130B7.BLKW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 23:22, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201130B7.LCSW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 21:27, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		120.5	67.4	121.2
Acetone		148.6	29.9	161.5
Methyl iodide		113.5	68.8	116.4
Carbon disulfide		107.5	63.8	137.4
tert-Methyl butyl ether (MTBE)		116.4	73.2	122.4
Acrylonitrile	*	132.3	69.9	128.9
2-Butanone (MEK)		123.9	44.0	134.4
Dichlorodifluoromethane		95.9	10.0	222.8
Chloromethane		110.7	23.8	166.5
Vinyl chloride		114.3	43.5	149.1
Bromomethane		113.6	56.8	151.3
Chloroethane		117.2	53.4	149.4
Trichlorofluoromethane		118.0	59.7	151.8
1,1-Dichloroethene		114.1	69.6	139.4
Methylene chloride		114.0	73.3	121.1
trans-1,2-Dichloroethene		113.4	73.6	129.3
1,1-Dichloroethane		117.5	71.5	126.2
cis-1,2-Dichloroethene		114.8	76.6	122.1
Tetrahydrofuran	*	127.2	59.0	117.9
Chloroform		118.5	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF201130W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 201130B7.LCSW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 21:27, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		114.4	78.2	120.8
1,1,1-Trichloroethane		117.2	79.4	130.9
4-Methyl-2-pentanone (MIBK)		112.0	71.6	125.2
2-Hexanone		112.0	55.4	136.9
Carbon tetrachloride		108.4	72.6	133.0
Benzene		106.7	79.9	124.9
1,2-Dichloroethane		105.4	76.0	126.3
Trichloroethene		111.7	79.7	124.2
1,2-Dichloropropane		111.1	78.6	126.4
Bromodichloromethane		110.8	80.4	128.2
Dibromomethane		106.1	76.9	122.1
cis-1,3-Dichloropropene		105.9	79.8	129.9
Toluene		108.9	79.8	124.5
trans-1,3-Dichloropropene		107.1	74.0	131.3
1,1,2-Trichloroethane		110.3	78.7	123.1
Tetrachloroethene	*	181.8	74.5	124.5
trans-1,4-Dichloro-2-butene		125.1	68.6	135.4
Dibromochloromethane		105.7	74.6	127.2
1,2-Dibromoethane		101.1	70.3	133.7
Chlorobenzene		101.3	79.2	122.7
1,1,1,2-Tetrachloroethane		104.4	80.3	128.2
Ethylbenzene		101.5	79.5	129.1
p,m-Xylene		102.4	79.4	132.2
o-Xylene		103.5	80.2	131.0
Styrene		102.7	69.5	126.7
Isopropylbenzene		102.7	74.4	121.5
Bromoform		108.6	69.4	128.0
1,1,2,2-Tetrachloroethane		99.9	79.8	126.3
1,2,3-Trichloropropane		104.8	78.3	138.8
n-Propylbenzene		101.4	82.0	130.7
Bromobenzene		100.6	78.7	124.6
1,3,5-Trimethylbenzene		102.6	81.3	128.9
tert-Butylbenzene		103.1	80.7	128.9
1,2,4-Trimethylbenzene		102.4	81.4	130.8
sec-Butylbenzene		102.7	77.4	129.8
p-Isopropyltoluene		102.9	79.8	137.5
1,3-Dichlorobenzene		100.2	77.0	131.3
1,4-Dichlorobenzene		99.1	20.7	137.7
1,2-Dichlorobenzene		102.1	10.0	166.2
1,2,3-Trimethylbenzene		102.4	76.3	124.2
n-Butylbenzene		100.6	80.0	133.3
Hexachloroethane		103.0	23.8	138.1
1,2-Dibromo-3-chloropropane		110.2	21.2	189.4
1,2,4-Trichlorobenzene		102.5	27.4	143.4
1,2,3-Trichlorobenzene		104.5	75.4	131.4
Naphthalene		104.5	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF201130W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 201130B7.LCSW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 21:27, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		108.2	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201130B7.LCSDW30C, Parent Sample ID: 201130B7.LCSW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 21:50, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		121.0	67.4	121.2	0.4	30.0
Acetone		147.3	29.9	161.5	0.9	30.0
Methyl iodide		115.1	68.8	116.4	1.4	30.0
Carbon disulfide		108.5	63.8	137.4	1.0	30.0
tert-Methyl butyl ether (MTBE)		118.5	73.2	122.4	1.8	30.0
Acrylonitrile	*	131.4	69.9	128.9	0.7	30.0
2-Butanone (MEK)		121.0	44.0	134.4	2.4	30.0
Dichlorodifluoromethane		97.7	10.0	222.8	1.9	30.0
Chloromethane		110.0	23.8	166.5	0.7	30.0
Vinyl chloride		116.0	43.5	149.1	1.5	30.0
Bromomethane		114.1	56.8	151.3	0.5	30.0
Chloroethane		118.1	53.4	149.4	0.8	30.0
Trichlorofluoromethane		122.2	59.7	151.8	3.5	30.0
1,1-Dichloroethene		116.0	69.6	139.4	1.7	30.0
Methylene chloride		115.0	73.3	121.1	0.9	30.0
trans-1,2-Dichloroethene		114.3	73.6	129.3	0.8	30.0
1,1-Dichloroethane		119.6	71.5	126.2	1.8	30.0
cis-1,2-Dichloroethene		115.4	76.6	122.1	0.5	30.0
Tetrahydrofuran	*	123.3	59.0	117.9	3.1	30.0
Chloroform		119.6	78.4	124.0	0.9	30.0
Bromochloromethane		115.2	78.2	120.8	0.7	30.0
1,1,1-Trichloroethane		119.7	79.4	130.9	2.1	30.0
4-Methyl-2-pentanone (MIBK)		113.4	71.6	125.2	1.2	30.0
2-Hexanone		110.2	55.4	136.9	1.7	30.0
Carbon tetrachloride		111.6	72.6	133.0	2.9	30.0
Benzene		107.3	79.9	124.9	0.6	30.0
1,2-Dichloroethane		106.2	76.0	126.3	0.8	30.0
Trichloroethene	*	130.5	79.7	124.2	15.5	30.0
1,2-Dichloropropane		111.8	78.6	126.4	0.7	30.0
Bromodichloromethane		112.4	80.4	128.2	1.5	30.0
Dibromomethane		107.2	76.9	122.1	1.0	30.0
cis-1,3-Dichloropropene		107.1	79.8	129.9	1.1	30.0
Toluene		109.4	79.8	124.5	0.5	30.0
trans-1,3-Dichloropropene		106.2	74.0	131.3	0.9	30.0
1,1,2-Trichloroethane		112.1	78.7	123.1	1.6	30.0
Tetrachloroethene	*	193.6	74.5	124.5	6.3	30.0
trans-1,4-Dichloro-2-butene		121.5	68.6	135.4	3.0	30.0
Dibromochloromethane		107.8	74.6	127.2	2.0	30.0
1,2-Dibromoethane		103.4	70.3	133.7	2.2	30.0
Chlorobenzene		103.2	79.2	122.7	1.9	30.0

Organics - Volatiles, Prep Batch ID: VF201130W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 201130B7.LCSDW30C, Parent Sample ID: 201130B7.LCSW30C

Run in Batch: 201130B7, Run Date: 11/30/2020 21:50, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		107.3	80.3	128.2	2.7	30.0
Ethylbenzene		104.0	79.5	129.1	2.4	30.0
p,m-Xylene		104.7	79.4	132.2	2.3	30.0
o-Xylene		105.7	80.2	131.0	2.1	30.0
Styrene		104.7	69.5	126.7	1.9	30.0
Isopropylbenzene		105.1	74.4	121.5	2.3	30.0
Bromoform		109.8	69.4	128.0	1.2	30.0
1,1,2,2-Tetrachloroethane		81.1	79.8	126.3	20.8	30.0
1,2,3-Trichloropropane		107.1	78.3	138.8	2.1	30.0
n-Propylbenzene		104.4	82.0	130.7	2.9	30.0
Bromobenzene		102.9	78.7	124.6	2.3	30.0
1,3,5-Trimethylbenzene		105.6	81.3	128.9	2.9	30.0
tert-Butylbenzene		106.1	80.7	128.9	2.8	30.0
1,2,4-Trimethylbenzene		104.1	81.4	130.8	1.6	30.0
sec-Butylbenzene		105.6	77.4	129.8	2.7	30.0
p-Isopropyltoluene		104.1	79.8	137.5	1.1	30.0
1,3-Dichlorobenzene		101.4	77.0	131.3	1.2	30.0
1,4-Dichlorobenzene		99.9	20.7	137.7	0.8	30.0
1,2-Dichlorobenzene		104.1	10.0	166.2	1.9	30.0
1,2,3-Trimethylbenzene		103.5	76.3	124.2	1.1	30.0
n-Butylbenzene		102.0	80.0	133.3	1.4	30.0
Hexachloroethane		105.7	23.8	138.1	2.5	30.0
1,2-Dibromo-3-chloropropane		111.0	21.2	189.4	0.7	30.0
1,2,4-Trichlorobenzene		104.4	27.4	143.4	1.8	30.0
1,2,3-Trichlorobenzene		106.1	75.4	131.4	1.5	30.0
Naphthalene		105.8	32.9	135.8	1.2	30.0
2-Methylnaphthalene		110.8	25.5	165.5	2.4	30.0

Matrix Spike (MS)

Lab Sample ID: 201130B7.1935609M, Parent Sample ID: S19356.08

Run in Batch: 201130B7, Run Date: 11/30/2020 22:13, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Benzene		98.2	79.9	124.9
Toluene		101.6	79.8	124.5
Ethylbenzene		98.2	79.5	129.1
p,m-Xylene		97.2	79.4	132.2
o-Xylene		99.7	80.2	131.0
1,3,5-Trimethylbenzene		98.3	81.3	128.9
1,2,4-Trimethylbenzene		99.4	81.4	130.8
Naphthalene		105.2	32.9	135.8
2-Methylnaphthalene		107.3	25.5	165.5

Organics - Volatiles, Prep Batch ID: VF201130W3 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201130B7.1935610N, Parent Sample ID: 201130B7.1935609M

Run in Batch: 201130B7, Run Date: 11/30/2020 22:36, Prep Date: 11/30/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Benzene		99.0	79.9	124.9	0.9	30.0
Toluene		101.5	79.8	124.5	0.2	30.0
Ethylbenzene		97.7	79.5	129.1	0.4	30.0
p,m-Xylene		97.2	79.4	132.2	0.1	30.0
o-Xylene		98.5	80.2	131.0	1.3	30.0
1,3,5-Trimethylbenzene		97.9	81.3	128.9	0.3	30.0
1,2,4-Trimethylbenzene		98.3	81.4	130.8	1.1	30.0
Naphthalene		102.2	32.9	135.8	2.9	30.0
2-Methylnaphthalene		104.3	25.5	165.5	2.8	30.0

Merit Laboratories Login Checklist

Lab Set ID: S19474
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.00102 / RACER Lansing
Submitted: 11/24/2020 14:50 Login User: MMC

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.1
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

128248

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Alex Villhauer
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248-994-2240 FAX NO.:
P.O. NO.: 30042872.00102
E-MAIL ADDRESS: Alex.Villhauer@arcadis.com
QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.00102 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / [signature]

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs 8260
19474.01	11/24/20	1130	SVMP-20-01 (5-10)	GW	3		3						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION [signature] / Arcadis ☒ Sampler DATE 11/24/20 TIME 1450
RECEIVED BY: SIGNATURE/ORGANIZATION Merit Drop Box DATE 11/24/20 TIME 1450

RELINQUISHED BY: SIGNATURE/ORGANIZATION Merit Drop Box DATE 11/24/2020 TIME 1450
RECEIVED BY: SIGNATURE/ORGANIZATION [signature] DATE 11/24/2020 TIME 1450

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Analytical Laboratory Report

Report ID: S19604.01(01)+QC01
Generated on 12/09/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19604.01-S19604.06
Project: 30042872 / Racer Lansing GWS
Collected Date(s): 12/01/2020 - 12/02/2020
Submitted Date/Time: 12/02/2020 16:50
Sampled by: Donald Richmond
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1
N/A	Not Applicable
SM4500-N(org)/NH	Standard Method 4500 N(org)B / NH3D 2011
SM4500-PE	Standard Method 4500 P E 2011
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (6 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19604.01	TW-15-11_120120	Groundwater	12/01/20 10:35
S19604.02	MW-13-22_120120	Groundwater	12/01/20 14:05
S19604.03	PW-14-03_120120	Groundwater	12/01/20 12:35
S19604.04	MW-13-34_120120	Groundwater	12/01/20 15:55
S19604.05	TW-14-06_120220	Groundwater	12/02/20 10:40
S19604.06	Dup-03_120220	Groundwater	12/02/20 00:01

Analytical Laboratory Report

Lab Sample ID: S19604.01
Sample Tag: TW-15-11_120120
Collected Date/Time: 12/01/2020 10:35
Matrix: Groundwater
COC Reference: 132265

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 13:20, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	51	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S19604.02
Sample Tag: MW-13-22_120120
Collected Date/Time: 12/01/2020 14:05
Matrix: Groundwater
COC Reference: 132265

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 13:46, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	162	1		ug/L	1	123-91-1	

Lab Sample ID: S19604.03
Sample Tag: PW-14-03_120120
Collected Date/Time: 12/01/2020 12:35
Matrix: Groundwater
COC Reference: 132265

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 14:12, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	71	1		ug/L	1	123-91-1	

Lab Sample ID: S19604.04
Sample Tag: MW-13-34_120120
Collected Date/Time: 12/01/2020 15:55
Matrix: Groundwater
COC Reference: 132265

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 14:37, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	106	1		ug/L	1	123-91-1	

Lab Sample ID: S19604.05
Sample Tag: TW-14-06_120220
Collected Date/Time: 12/02/2020 10:40
Matrix: Groundwater
COC Reference: 132265

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR
1	250ml Plastic	None	Yes	2.2	IR
1	250ml Plastic	H2SO4	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	>2	N/A	12/09/20 12:35	BML	

Inorganics

Method: E300.0, Run Date: 12/03/20 11:37, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 12/03/20 15:43, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	18.0	0.4		mg/L	1		

Method: SM4500-PE, Run Date: 12/06/20 17:03, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	22	3	2	mg/L	250	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 22:20, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S19604.06
Sample Tag: Dup-03_120220
Collected Date/Time: 12/02/2020 00:01
Matrix: Groundwater
COC Reference: 132265

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR
1	250ml Plastic	None	Yes	2.2	IR
1	250ml Plastic	H2SO4	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	>2	N/A	12/09/20 12:35	BML	

Inorganics

Method: E300.0, Run Date: 12/03/20 11:50, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 12/03/20 15:57, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	19.1	0.4		mg/L	1		

Method: SM4500-PE, Run Date: 12/06/20 16:57, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	24	3	2	mg/L	250	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 17:35, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S19604.01(01)+QC01
Generated on 12/09/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19604.01-S19604.06
Project: 30042872 / Racer Lansing GWS
Submitted Date/Time: 12/02/2020 16:50
Sampled by: Donald Richmond
P.O. #: 30042872

QC Report Sections

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Analysis Summary (Pages 13-18)
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Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S19604.01
Sample Tag: TW-15-11_120120
Collected Date/Time: 12/01/2020 10:35
Matrix: Groundwater
COC Reference: 132265

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 13:20	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19604.02
Sample Tag: MW-13-22_120120
Collected Date/Time: 12/01/2020 14:05
Matrix: Groundwater
COC Reference: 132265

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 13:46	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19604.03
Sample Tag: PW-14-03_120120
Collected Date/Time: 12/01/2020 12:35
Matrix: Groundwater
COC Reference: 132265

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 14:12	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19604.04
Sample Tag: MW-13-34_120120
Collected Date/Time: 12/01/2020 15:55
Matrix: Groundwater
COC Reference: 132265

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 14:37	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19604.05

Sample Tag: TW-14-06_120220

Collected Date/Time: 12/02/2020 10:40

Matrix: Groundwater

COC Reference: 132265

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	12/03/20 11:37	NTRA201203-W1-B	NTRA201203-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 15:43	TKN201203QC	TKN201203QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	12/06/20 17:03	PHS201206QC	PHS201206QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 22:20	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19604.06

Sample Tag: Dup-03_120220

Collected Date/Time: 12/02/2020 00:01

Matrix: Groundwater

COC Reference: 132265

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	12/03/20 11:50	NTRA201203-W1-B	NTRA201203-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 15:57	TKN201203QC	TKN201203QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	12/06/20 16:57	PHS201206QC	PHS201206QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 17:35	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: NTRA201203-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19604.05	Nitrate-N	E300.0	12/03/20 11:37	NTRA201203-W1-B
S19604.06	Nitrate-N	E300.0	12/03/20 11:50	NTRA201203-W1-B

Inorganics, Prep Batch ID: PHS201206QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19604.05	Total Phosphorus	SM4500-PE	12/06/20 17:03	PHS201206QC
S19604.06	Total Phosphorus	SM4500-PE	12/06/20 16:57	PHS201206QC

Inorganics, Prep Batch ID: TKN201203QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19604.05	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 15:43	TKN201203QC
S19604.06	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 15:57	TKN201203QC

Organics - Volatiles, Prep Batch ID: VS201208W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19604.01	1,4-Dioxane	SW8260B - SIM	12/08/20 13:20	201208A9
S19604.02	1,4-Dioxane	SW8260B - SIM	12/08/20 13:46	201208A9
S19604.03	1,4-Dioxane	SW8260B - SIM	12/08/20 14:12	201208A9
S19604.04	1,4-Dioxane	SW8260B - SIM	12/08/20 14:37	201208A9
S19604.05	1,4-Dioxane	SW8260B - SIM	12/08/20 22:20	201208A9
S19604.06	1,4-Dioxane	SW8260B - SIM	12/08/20 17:35	201208A9

Organics - Volatiles, Prep Batch ID: VS201208W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201208A9.BLKW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 11:39, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208A9.LCSDW08A, Parent Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:04, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 201208A9.1960602M, Parent Sample ID: S19606.01

Run in Batch: 201208A9, Run Date: 12/08/2020 15:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201208A9.1960603N, Parent Sample ID: 201208A9.1960602M

Run in Batch: 201208A9, Run Date: 12/08/2020 16:19, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19604.01

Sample Tag: TW-15-11_120120

Collected Date/Time: 12/01/2020 10:35

Matrix: Groundwater

COC Reference: 132265

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 13:20, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**107.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19604.02

Sample Tag: MW-13-22_120120

Collected Date/Time: 12/01/2020 14:05

Matrix: Groundwater

COC Reference: 132265

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 13:46, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**104.9**	50.0	200.0

Lab Sample ID: S19604.03

Sample Tag: PW-14-03_120120

Collected Date/Time: 12/01/2020 12:35

Matrix: Groundwater

COC Reference: 132265

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 14:12, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.4**	50.0	200.0

Lab Sample ID: S19604.04

Sample Tag: MW-13-34_120120

Collected Date/Time: 12/01/2020 15:55

Matrix: Groundwater

COC Reference: 132265

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 14:37, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19604.05

Sample Tag: TW-14-06_120220

Collected Date/Time: 12/02/2020 10:40

Matrix: Groundwater

COC Reference: 132265

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 22:20, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.6**	50.0	200.0

Lab Sample ID: S19604.06

Sample Tag: Dup-03_120220

Collected Date/Time: 12/02/2020 00:01

Matrix: Groundwater

COC Reference: 132265

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 17:35, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**103.2**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201208W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201208A9.BLKW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**91.4**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 11:39, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**100.2**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208A9.LCSDW08A, Parent Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:04, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**103.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 201208A9.1960602M, Parent Sample ID: S19606.01

Run in Batch: 201208A9, Run Date: 12/08/2020 15:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**113.0**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201208A9.1960603N, Parent Sample ID: 201208A9.1960602M

Run in Batch: 201208A9, Run Date: 12/08/2020 16:19, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.3**	50.0	200.0

Inorganics, Prep Batch ID: NTRA201203-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA201203-W1-B.LRB1

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 08:37, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA201203-W1-B.LCS1

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 09:03, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		97	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA201203-W1-B.MS1, Parent Sample ID: S19601.01

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 11:11, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		100	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA201203-W1-B.MSD1, Parent Sample ID: NTRA201203-W1-B.MS1

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 11:24, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		100	80	120	0	15

Duplicate (DUP)

Lab Sample ID: NTRA201203-W1-B.DP1, Parent Sample ID: S19601.01

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 10:58, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	RPD	RPD CL
Nitrate-N		<1	15

Inorganics, Prep Batch ID: PHS201206QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS201206QC.LRB1

Run in Batch: PHS201206QC, Run Date: 12/06/2020 12:32, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS201206QC.LRB2

Run in Batch: PHS201206QC, Run Date: 12/06/2020 12:39, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS201206QC.LCS1

Run in Batch: PHS201206QC, Run Date: 12/06/2020 12:45, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		98	90	110

Matrix Spike (MS)

Lab Sample ID: PHS201206QC.MS1, Parent Sample ID: S19655.02

Run in Batch: PHS201206QC, Run Date: 12/06/2020 17:30, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		91	80	120

Duplicate (DUP)

Lab Sample ID: PHS201206QC.DP1, Parent Sample ID: S19540.01

Run in Batch: PHS201206QC, Run Date: 12/06/2020 17:27, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		1.8	20

Inorganics, Prep Batch ID: TKN201203QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN201203QC.LRB1

Run in Batch: TKN201203QC, Run Date: 12/03/2020 11:25, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.02	mg/L

Blank (BLK)

Lab Sample ID: TKN201203QC.LRB2

Run in Batch: TKN201203QC, Run Date: 12/03/2020 13:04, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN201203QC.LCS1

Run in Batch: TKN201203QC, Run Date: 12/03/2020 13:19, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		100	90	110

Matrix Spike (MS)

Lab Sample ID: TKN201203QC.MS1, Parent Sample ID: S19503.01

Run in Batch: TKN201203QC, Run Date: 12/03/2020 13:55, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		103	80	120

Duplicate (DUP)

Lab Sample ID: TKN201203QC.DP1, Parent Sample ID: S19583.02

Run in Batch: TKN201203QC, Run Date: 12/03/2020 15:17, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		2.7	20

Organics - Volatiles, Prep Batch ID: VS201208W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201208A9.BLKW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 11:39, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		104.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208A9.LCSDW08A, Parent Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:04, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		104.7	70.0	130.0	0.2	30.0

Matrix Spike (MS)

Lab Sample ID: 201208A9.1960602M, Parent Sample ID: S19606.01

Run in Batch: 201208A9, Run Date: 12/08/2020 15:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		97.3	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201208A9.1960603N, Parent Sample ID: 201208A9.1960602M

Run in Batch: 201208A9, Run Date: 12/08/2020 16:19, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		105.3	70.0	130.0	7.9	30.0

Merit Laboratories Login Checklist

Lab Set ID: S19604
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / Racer Lansing GWS
Submitted: 12/02/2020 16:50 Login User: REJ

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S19604 Submitted: 12/02/2020 16:50

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30042872 / Racer Lansing GWS

Initial Preservation Check: 12/02/2020 17:24 REJ

Preservation Recheck (E200.8): N/A

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S19604.05	250ml Plastic H2SO4	<2			
S19604.06	250ml Plastic H2SO4	<2			

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

132265

CHAIN OF CUSTODY RECORD

Plant 3

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr Suite 500
CITY: Nov. STATE: MI ZIP CODE: 48377
PHONE NO.: 517.8610138 FAX NO: P.O NO:
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO:

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / Racer Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Derek Richmond/Jamie Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☑ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane	Nitrate	TKN, Total phosphorus
196004.01	12/1/20	1035	TW-15-11_120120	GW	3		X						X		
-02	12/1/20	1405	MW-13-22_120120	GW	3		X						X		
-03	12/1/20	1235	PW-14-03_120120	GW	3		X						X		
-04	12/1/20	1555	MW-13-34_120120	GW	3		X						X		
-05	12/2/20	1040	TW-14-06_120220	GW	5		X		X				X	X	X
-06	12/2/20	—	Dup-03_120220	GW	5		X		X				X	X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION ☒ Sampler DATE 12-2-20 TIME 1650
RECEIVED BY: SIGNATURE/ORGANIZATION DATE 12/2/20 TIME 1650
RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP ON ARRIVAL 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Analytical Laboratory Report

Report ID: S19605.01(01)+QC01
Generated on 12/09/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19605.01-S19605.03
Project: 30042872 / Racer Lansing GWS
Collected Date(s): 12/02/2020
Submitted Date/Time: 12/02/2020 16:50
Sampled by: Donald Richmond
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1
N/A	Not Applicable
SM4500-N(org)/NH	Standard Method 4500 N(org)B / NH3D 2011
SM4500-PE	Standard Method 4500 P E 2011
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19605.01	TW-15-12_120220	Groundwater	12/02/20 12:40
S19605.02	MW-20-127_120220	Groundwater	12/02/20 14:35
S19605.03	TW-14-02_120220	Groundwater	12/02/20 16:00

Analytical Laboratory Report

Lab Sample ID: S19605.01
Sample Tag: TW-15-12_120220
Collected Date/Time: 12/02/2020 12:40
Matrix: Groundwater
COC Reference: 094736

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR
1	250ml Plastic	H2SO4	Yes	2.2	IR
1	250ml Plastic	None	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Inorganics

Method: E300.0, Run Date: 12/03/20 12:16, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 12/03/20 16:14, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	2.0	0.2		mg/L	1		

Method: SM4500-PE, Run Date: 12/06/20 17:12, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.76	0.1	0.09	mg/L	10	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 18:01, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	34	1		ug/L	1	123-91-1	

Lab Sample ID: S19605.02
Sample Tag: MW-20-127_120220
Collected Date/Time: 12/02/2020 14:35
Matrix: Groundwater
COC Reference: 094736

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR
1	250ml Plastic	H2SO4	Yes	2.2	IR
1	250ml Plastic	None	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Inorganics

Method: E300.0, Run Date: 12/03/20 12:28, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 12/03/20 16:36, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.7	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 12/06/20 17:16, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.16	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 18:27, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	157	1		ug/L	1	123-91-1	

Lab Sample ID: S19605.03
Sample Tag: TW-14-02_120220
Collected Date/Time: 12/02/2020 16:00
Matrix: Groundwater
COC Reference: 094736

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 18:53, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S19605.01(01)+QC01
Generated on 12/09/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19605.01-S19605.03
Project: 30042872 / Racer Lansing GWS
Submitted Date/Time: 12/02/2020 16:50
Sampled by: Donald Richmond
P.O. #: 30042872

QC Report Sections

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Internal Standards per QC Sample (Page 18)
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Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S19605.01
Sample Tag: TW-15-12_120220
Collected Date/Time: 12/02/2020 12:40
Matrix: Groundwater
COC Reference: 094736

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	12/03/20 12:16	NTRA201203-W1-B	NTRA201203-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 16:14	TKN201203QC	TKN201203QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	12/06/20 17:12	PHS201206QC	PHS201206QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 18:01	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Analysis Summary

Lab Sample ID: S19605.02
Sample Tag: MW-20-127_120220
Collected Date/Time: 12/02/2020 14:35
Matrix: Groundwater
COC Reference: 094736

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	12/03/20 12:28	NTRA201203-W1-B	NTRA201203-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 16:36	TKN201203QC	TKN201203QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	12/06/20 17:16	PHS201206QC	PHS201206QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 18:27	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19605.03
Sample Tag: TW-14-02_120220
Collected Date/Time: 12/02/2020 16:00
Matrix: Groundwater
COC Reference: 094736

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 18:53	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: NTRA201203-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19605.01	Nitrate-N	E300.0	12/03/20 12:16	NTRA201203-W1-B
S19605.02	Nitrate-N	E300.0	12/03/20 12:28	NTRA201203-W1-B

Inorganics, Prep Batch ID: PHS201206QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19605.01	Total Phosphorus	SM4500-PE	12/06/20 17:12	PHS201206QC
S19605.02	Total Phosphorus	SM4500-PE	12/06/20 17:16	PHS201206QC

Inorganics, Prep Batch ID: TKN201203QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19605.01	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 16:14	TKN201203QC
S19605.02	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 16:36	TKN201203QC

Organics - Volatiles, Prep Batch ID: VS201208W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19605.01	1,4-Dioxane	SW8260B - SIM	12/08/20 18:01	201208A9
S19605.02	1,4-Dioxane	SW8260B - SIM	12/08/20 18:27	201208A9
S19605.03	1,4-Dioxane	SW8260B - SIM	12/08/20 18:53	201208A9

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS201208W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201208A9.BLKW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 11:39, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208A9.LCSDW08A, Parent Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:04, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 201208A9.1960602M, Parent Sample ID: S19606.01

Run in Batch: 201208A9, Run Date: 12/08/2020 15:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201208A9.1960603N, Parent Sample ID: 201208A9.1960602M

Run in Batch: 201208A9, Run Date: 12/08/2020 16:19, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19605.01

Sample Tag: TW-15-12_120220

Collected Date/Time: 12/02/2020 12:40

Matrix: Groundwater

COC Reference: 094736

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 18:01, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19605.02

Sample Tag: MW-20-127_120220

Collected Date/Time: 12/02/2020 14:35

Matrix: Groundwater

COC Reference: 094736

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 18:27, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**104.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19605.03

Sample Tag: TW-14-02_120220

Collected Date/Time: 12/02/2020 16:00

Matrix: Groundwater

COC Reference: 094736

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 18:53, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.8**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201208W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201208A9.BLKW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**91.4**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 11:39, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**100.2**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208A9.LCSDW08A, Parent Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:04, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**103.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 201208A9.1960602M, Parent Sample ID: S19606.01

Run in Batch: 201208A9, Run Date: 12/08/2020 15:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**113.0**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201208A9.1960603N, Parent Sample ID: 201208A9.1960602M

Run in Batch: 201208A9, Run Date: 12/08/2020 16:19, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.3**	50.0	200.0

Inorganics, Prep Batch ID: NTRA201203-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA201203-W1-B.LRB1

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 08:37, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA201203-W1-B.LCS1

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 09:03, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		97	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA201203-W1-B.MS1, Parent Sample ID: S19601.01

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 11:11, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		100	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA201203-W1-B.MSD1, Parent Sample ID: NTRA201203-W1-B.MS1

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 11:24, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		100	80	120	0	15

Duplicate (DUP)

Lab Sample ID: NTRA201203-W1-B.DP1, Parent Sample ID: S19601.01

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 10:58, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	RPD	RPD CL
Nitrate-N		<1	15

Inorganics, Prep Batch ID: PHS201206QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS201206QC.LRB1

Run in Batch: PHS201206QC, Run Date: 12/06/2020 12:32, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS201206QC.LRB2

Run in Batch: PHS201206QC, Run Date: 12/06/2020 12:39, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS201206QC.LCS1

Run in Batch: PHS201206QC, Run Date: 12/06/2020 12:45, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		98	90	110

Matrix Spike (MS)

Lab Sample ID: PHS201206QC.MS1, Parent Sample ID: S19655.02

Run in Batch: PHS201206QC, Run Date: 12/06/2020 17:30, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		91	80	120

Duplicate (DUP)

Lab Sample ID: PHS201206QC.DP1, Parent Sample ID: S19540.01

Run in Batch: PHS201206QC, Run Date: 12/06/2020 17:27, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		1.8	20

Inorganics, Prep Batch ID: TKN201203QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN201203QC.LRB1

Run in Batch: TKN201203QC, Run Date: 12/03/2020 11:25, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.02	mg/L

Blank (BLK)

Lab Sample ID: TKN201203QC.LRB2

Run in Batch: TKN201203QC, Run Date: 12/03/2020 13:04, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN201203QC.LCS1

Run in Batch: TKN201203QC, Run Date: 12/03/2020 13:19, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		100	90	110

Matrix Spike (MS)

Lab Sample ID: TKN201203QC.MS1, Parent Sample ID: S19503.01

Run in Batch: TKN201203QC, Run Date: 12/03/2020 13:55, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		103	80	120

Duplicate (DUP)

Lab Sample ID: TKN201203QC.DP1, Parent Sample ID: S19583.02

Run in Batch: TKN201203QC, Run Date: 12/03/2020 15:17, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		2.7	20

Organics - Volatiles, Prep Batch ID: VS201208W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201208A9.BLKW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 11:39, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		104.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208A9.LCSDW08A, Parent Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:04, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		104.7	70.0	130.0	0.2	30.0

Matrix Spike (MS)

Lab Sample ID: 201208A9.1960602M, Parent Sample ID: S19606.01

Run in Batch: 201208A9, Run Date: 12/08/2020 15:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		97.3	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201208A9.1960603N, Parent Sample ID: 201208A9.1960602M

Run in Batch: 201208A9, Run Date: 12/08/2020 16:19, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		105.3	70.0	130.0	7.9	30.0

Merit Laboratories Login Checklist

Lab Set ID: S19605
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / Racer Lansing GWS
Submitted: 12/02/2020 16:50 Login User: REJ

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S19605 Submitted: 12/02/2020 16:50

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30042872 / Racer Lansing GWS

Initial Preservation Check: 12/02/2020 17:28 REJ

Preservation Recheck (E200.8): N/A

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S19605.01	250ml Plastic H2SO4	<2			
S19605.02	250ml Plastic H2SO4	<2			
S19605.03	250ml Plastic H2SO4	<2			

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 2 OF 2

094736

Plant 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr Suite 500
CITY: Lansing STATE: MI ZIP CODE: 48377
PHONE NO.: 517 861 0138 FAX NO: P.O. NO:
E MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO:

INVOICE TO

CONTACT NAME: ☑ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / Racer Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: David Richmond / David Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☑ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane	Nitrate	TKN, Total Phosphate	Special Instructions
194005.01	12/2/20	1240	TW-15-12_120220	GW	5	X			X				X	X	X	
-02	12/2/20	1435	MW-20-127_120220	GW	5	X			X				X	X	X	
-03	12/2/20	1600	TW-14-02_120220	GW	5	X			X				X	X	X	← 1,4D only

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☑ Sampler	DATE 12-2-20	TIME 1650
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/2/20	TIME 1650
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
SEAL NO	SEAL INTACT YES ☐ NO ☐	INITIALS	
SEAL NO	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: TEMP ON ARRIVAL 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Analytical Laboratory Report

Report ID: S19606.01(01)+QC01
Generated on 12/09/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19606.01-S19606.12
Project: 30042872 Tash 04700 / RACER Lansing
Collected Date(s): 12/01/2020 - 12/02/2020
Submitted Date/Time: 12/02/2020 16:50
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872.04700

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1
N/A	Not Applicable
SM4500-N(org)/NH	Standard Method 4500 N(org)B / NH3D 2011
SM4500-PE	Standard Method 4500 P E 2011
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (12 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19606.01	MW-16-74_120120	Groundwater	12/01/20 11:00
S19606.02	MW-16-74_120120 MS	Groundwater	12/01/20 11:00
S19606.03	MW-16-74_120120 MSD	Groundwater	12/01/20 11:00
S19606.04	MW-16-84_120120	Groundwater	12/01/20 12:35
S19606.05	MW-17-86_120120	Groundwater	12/01/20 14:35
S19606.06	MW-19-115_120120	Groundwater	12/01/20 15:55
S19606.07	MW-19-116_120220	Groundwater	12/02/20 09:55
S19606.08	DUP-01_120220	Groundwater	12/02/20 00:01
S19606.09	MW-14-61_120220	Groundwater	12/02/20 11:25
S19606.10	MW-19-120_120220	Groundwater	12/02/20 12:45
S19606.11	MW-19-121_120220	Groundwater	12/02/20 14:25
S19606.12	MW-19-117_120220	Groundwater	12/02/20 15:45

Analytical Laboratory Report

Lab Sample ID: S19606.01
Sample Tag: MW-16-74_120120
Collected Date/Time: 12/01/2020 11:00
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 17:09, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S19606.02
Sample Tag: MW-16-74_120120 MS
Collected Date/Time: 12/01/2020 11:00
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 15:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	49	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S19606.03
Sample Tag: MW-16-74_120120 MSD
Collected Date/Time: 12/01/2020 11:00
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 16:19, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	53	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Analytical Laboratory Report

Lab Sample ID: S19606.04
Sample Tag: MW-16-84_120120
Collected Date/Time: 12/01/2020 12:35
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 19:19, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	81	1		ug/L	1	123-91-1	

Lab Sample ID: S19606.05
Sample Tag: MW-17-86_120120
Collected Date/Time: 12/01/2020 14:35
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 15:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	106	1		ug/L	1	123-91-1	

Lab Sample ID: S19606.06
Sample Tag: MW-19-115_120120
Collected Date/Time: 12/01/2020 15:55
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 15:29, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	12	1		ug/L	1	123-91-1	

Lab Sample ID: S19606.07
Sample Tag: MW-19-116_120220
Collected Date/Time: 12/02/2020 09:55
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 19:44, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	82	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S19606.08
Sample Tag: DUP-01_120220
Collected Date/Time: 12/02/2020 00:01
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 20:11, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	83	1		ug/L	1	123-91-1	

Lab Sample ID: S19606.09
Sample Tag: MW-14-61_120220
Collected Date/Time: 12/02/2020 11:25
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR
1	250ml Plastic	None	Yes	2.2	IR
1	250ml Plastic	H2SO4	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Inorganics

Method: E300.0, Run Date: 12/03/20 12:41, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	Not detected	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 12/03/20 16:56, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.3	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 12/06/20 17:19, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	0.15	0.01	0.009	mg/L	1	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 20:36, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	18	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S19606.10
Sample Tag: MW-19-120_120220
Collected Date/Time: 12/02/2020 12:45
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 21:02, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	28	1		ug/L	1	123-91-1	

Lab Sample ID: S19606.11
Sample Tag: MW-19-121_120220
Collected Date/Time: 12/02/2020 14:25
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR
1	250ml Plastic	None	Yes	2.2	IR
1	250ml Plastic	H2SO4	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Inorganics

Method: E300.0, Run Date: 12/03/20 12:54, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Nitrate-N	8.2	0.5	0.04	mg/L	5	14797-55-8	

Method: SM4500-N(org)/NH, Run Date: 12/03/20 17:12, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Kjeldahl Nitrogen	0.5	0.1		mg/L	1		

Method: SM4500-PE, Run Date: 12/06/20 17:24, Analyst: MJC

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Phosphorus	1.74	0.05	0.045	mg/L	5	7723-14-0	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 21:28, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	4	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S19606.12
Sample Tag: MW-19-117_120220
Collected Date/Time: 12/02/2020 15:45
Matrix: Groundwater
COC Reference: 134629

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 12:35	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/08/20 21:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S19606.01(01)+QC01
Generated on 12/09/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19606.01-S19606.12
Project: 30042872 Tash 04700 / RACER Lansing
Submitted Date/Time: 12/02/2020 16:50
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872.04700

QC Report Sections

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Analysis Summary (Pages 19-30)
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Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S19606.01
Sample Tag: MW-16-74_120120
Collected Date/Time: 12/01/2020 11:00
Matrix: Groundwater
COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 17:09	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19606.02
Sample Tag: MW-16-74_120120 MS
Collected Date/Time: 12/01/2020 11:00
Matrix: Groundwater
COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 15:54	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19606.03
Sample Tag: MW-16-74_120120 MSD
Collected Date/Time: 12/01/2020 11:00
Matrix: Groundwater
COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 16:19	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19606.04
Sample Tag: MW-16-84_120120
Collected Date/Time: 12/01/2020 12:35
Matrix: Groundwater
COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 19:19	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19606.05
Sample Tag: MW-17-86_120120
Collected Date/Time: 12/01/2020 14:35
Matrix: Groundwater
COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 15:04	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19606.06
Sample Tag: MW-19-115_120120
Collected Date/Time: 12/01/2020 15:55
Matrix: Groundwater
COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 15:29	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19606.07
Sample Tag: MW-19-116_120220
Collected Date/Time: 12/02/2020 09:55
Matrix: Groundwater
COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 19:44	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19606.08

Sample Tag: DUP-01_120220

Collected Date/Time: 12/02/2020 00:01

Matrix: Groundwater

COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 20:11	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19606.09
Sample Tag: MW-14-61_120220
Collected Date/Time: 12/02/2020 11:25
Matrix: Groundwater
COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	12/03/20 12:41	NTRA201203-W1-B	NTRA201203-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 16:56	TKN201203QC	TKN201203QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	12/06/20 17:19	PHS201206QC	PHS201206QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 20:36	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19606.10
Sample Tag: MW-19-120_120220
Collected Date/Time: 12/02/2020 12:45
Matrix: Groundwater
COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 21:02	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19606.11
Sample Tag: MW-19-121_120220
Collected Date/Time: 12/02/2020 14:25
Matrix: Groundwater
COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Nitrate-N	E300.0	12/03/20 12:54	NTRA201203-W1-B	NTRA201203-W1-B	No	BLK/LCS/MS/MSD/DU
Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 17:12	TKN201203QC	TKN201203QC	No	BLK/LCS/MS/DUP
Total Phosphorus	SM4500-PE	12/06/20 17:24	PHS201206QC	PHS201206QC	No	BLK/LCS/MS/DUP
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 21:28	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19606.12
Sample Tag: MW-19-117_120220
Collected Date/Time: 12/02/2020 15:45
Matrix: Groundwater
COC Reference: 134629

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/08/20 21:54	201208A9	VS201208W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Inorganics, Prep Batch ID: NTRA201203-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19606.09	Nitrate-N	E300.0	12/03/20 12:41	NTRA201203-W1-B
S19606.11	Nitrate-N	E300.0	12/03/20 12:54	NTRA201203-W1-B

Inorganics, Prep Batch ID: PHS201206QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19606.09	Total Phosphorus	SM4500-PE	12/06/20 17:19	PHS201206QC
S19606.11	Total Phosphorus	SM4500-PE	12/06/20 17:24	PHS201206QC

Inorganics, Prep Batch ID: TKN201203QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19606.09	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 16:56	TKN201203QC
S19606.11	Total Kjeldahl Nitrogen	SM4500-N(org)/NH	12/03/20 17:12	TKN201203QC

Organics - Volatiles, Prep Batch ID: VS201208W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19606.01	1,4-Dioxane	SW8260B - SIM	12/08/20 17:09	201208A9
S19606.02	1,4-Dioxane	SW8260B - SIM	12/08/20 15:54	201208A9
S19606.03	1,4-Dioxane	SW8260B - SIM	12/08/20 16:19	201208A9
S19606.04	1,4-Dioxane	SW8260B - SIM	12/08/20 19:19	201208A9
S19606.05	1,4-Dioxane	SW8260B - SIM	12/08/20 15:04	201208A9
S19606.06	1,4-Dioxane	SW8260B - SIM	12/08/20 15:29	201208A9
S19606.07	1,4-Dioxane	SW8260B - SIM	12/08/20 19:44	201208A9
S19606.08	1,4-Dioxane	SW8260B - SIM	12/08/20 20:11	201208A9
S19606.09	1,4-Dioxane	SW8260B - SIM	12/08/20 20:36	201208A9
S19606.10	1,4-Dioxane	SW8260B - SIM	12/08/20 21:02	201208A9
S19606.11	1,4-Dioxane	SW8260B - SIM	12/08/20 21:28	201208A9
S19606.12	1,4-Dioxane	SW8260B - SIM	12/08/20 21:54	201208A9

Organics - Volatiles, Prep Batch ID: VS201208W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201208A9.BLKW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 11:39, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208A9.LCSDW08A, Parent Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:04, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 201208A9.1960602M, Parent Sample ID: S19606.01

Run in Batch: 201208A9, Run Date: 12/08/2020 15:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201208A9.1960603N, Parent Sample ID: 201208A9.1960602M

Run in Batch: 201208A9, Run Date: 12/08/2020 16:19, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Lab Sample ID: S19606.01

Sample Tag: MW-16-74_120120

Collected Date/Time: 12/01/2020 11:00

Matrix: Groundwater

COC Reference: 134629

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 17:09, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.9**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19606.04

Sample Tag: MW-16-84_120120

Collected Date/Time: 12/01/2020 12:35

Matrix: Groundwater

COC Reference: 134629

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 19:19, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.6**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19606.05

Sample Tag: MW-17-86_120120

Collected Date/Time: 12/01/2020 14:35

Matrix: Groundwater

COC Reference: 134629

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 15:04, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.8**	50.0	200.0

Lab Sample ID: S19606.06

Sample Tag: MW-19-115_120120

Collected Date/Time: 12/01/2020 15:55

Matrix: Groundwater

COC Reference: 134629

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 15:29, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.9**	50.0	200.0

Lab Sample ID: S19606.07

Sample Tag: MW-19-116_120220

Collected Date/Time: 12/02/2020 09:55

Matrix: Groundwater

COC Reference: 134629

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 19:44, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**102.5**	50.0	200.0

Lab Sample ID: S19606.08

Sample Tag: DUP-01_120220

Collected Date/Time: 12/02/2020 00:01

Matrix: Groundwater

COC Reference: 134629

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 20:11, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19606.09

Sample Tag: MW-14-61_120220

Collected Date/Time: 12/02/2020 11:25

Matrix: Groundwater

COC Reference: 134629

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 20:36, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**101.1**	50.0	200.0

Lab Sample ID: S19606.10

Sample Tag: MW-19-120_120220

Collected Date/Time: 12/02/2020 12:45

Matrix: Groundwater

COC Reference: 134629

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 21:02, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**105.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19606.11

Sample Tag: MW-19-121_120220

Collected Date/Time: 12/02/2020 14:25

Matrix: Groundwater

COC Reference: 134629

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 21:28, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**98.1**	50.0	200.0

Lab Sample ID: S19606.12

Sample Tag: MW-19-117_120220

Collected Date/Time: 12/02/2020 15:45

Matrix: Groundwater

COC Reference: 134629

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201208A9, Run Date: 12/08/2020 21:54, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**98.1**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201208W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201208A9.BLKW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**91.4**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 11:39, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**100.2**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208A9.LCSDW08A, Parent Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:04, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**103.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 201208A9.1960602M, Parent Sample ID: S19606.01

Run in Batch: 201208A9, Run Date: 12/08/2020 15:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**113.0**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201208A9.1960603N, Parent Sample ID: 201208A9.1960602M

Run in Batch: 201208A9, Run Date: 12/08/2020 16:19, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.3**	50.0	200.0

Inorganics, Prep Batch ID: NTRA201203-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Blank (BLK)

Lab Sample ID: NTRA201203-W1-B.LRB1

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 08:37, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Nitrate-N		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: NTRA201203-W1-B.LCS1

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 09:03, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		97	90	110

Matrix Spike (MS)

Lab Sample ID: NTRA201203-W1-B.MS1, Parent Sample ID: S19601.01

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 11:11, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Nitrate-N		100	80	120

Matrix Spike Duplicate (MSD)

Lab Sample ID: NTRA201203-W1-B.MSD1, Parent Sample ID: NTRA201203-W1-B.MS1

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 11:24, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Nitrate-N		100	80	120	0	15

Duplicate (DUP)

Lab Sample ID: NTRA201203-W1-B.DP1, Parent Sample ID: S19601.01

Run in Batch: NTRA201203-W1-B, Run Date: 12/03/2020 10:58, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 5

Analyte	Flags	RPD	RPD CL
Nitrate-N		<1	15

Inorganics, Prep Batch ID: PHS201206QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: PHS201206QC.LRB1

Run in Batch: PHS201206QC, Run Date: 12/06/2020 12:32, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Blank (BLK)

Lab Sample ID: PHS201206QC.LRB2

Run in Batch: PHS201206QC, Run Date: 12/06/2020 12:39, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Phosphorus		ND	0.01	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: PHS201206QC.LCS1

Run in Batch: PHS201206QC, Run Date: 12/06/2020 12:45, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		98	90	110

Matrix Spike (MS)

Lab Sample ID: PHS201206QC.MS1, Parent Sample ID: S19655.02

Run in Batch: PHS201206QC, Run Date: 12/06/2020 17:30, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Phosphorus		91	80	120

Duplicate (DUP)

Lab Sample ID: PHS201206QC.DP1, Parent Sample ID: S19540.01

Run in Batch: PHS201206QC, Run Date: 12/06/2020 17:27, Prep Date: 12/06/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Phosphorus		1.8	20

Inorganics, Prep Batch ID: TKN201203QC

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Blank (BLK)

Lab Sample ID: TKN201203QC.LRB1

Run in Batch: TKN201203QC, Run Date: 12/03/2020 11:25, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.02	mg/L

Blank (BLK)

Lab Sample ID: TKN201203QC.LRB2

Run in Batch: TKN201203QC, Run Date: 12/03/2020 13:04, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Total Kjeldahl Nitrogen		ND	0.1	mg/L

Laboratory Control Sample (LCS)

Lab Sample ID: TKN201203QC.LCS1

Run in Batch: TKN201203QC, Run Date: 12/03/2020 13:19, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		100	90	110

Matrix Spike (MS)

Lab Sample ID: TKN201203QC.MS1, Parent Sample ID: S19503.01

Run in Batch: TKN201203QC, Run Date: 12/03/2020 13:55, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Total Kjeldahl Nitrogen		103	80	120

Duplicate (DUP)

Lab Sample ID: TKN201203QC.DP1, Parent Sample ID: S19583.02

Run in Batch: TKN201203QC, Run Date: 12/03/2020 15:17, Prep Date: 12/03/2020, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Total Kjeldahl Nitrogen		2.7	20

Organics - Volatiles, Prep Batch ID: VS201208W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201208A9.BLKW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 11:39, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		104.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208A9.LCSDW08A, Parent Sample ID: 201208A9.LCSW08A

Run in Batch: 201208A9, Run Date: 12/08/2020 12:04, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		104.7	70.0	130.0	0.2	30.0

Matrix Spike (MS)

Lab Sample ID: 201208A9.1960602M, Parent Sample ID: S19606.01

Run in Batch: 201208A9, Run Date: 12/08/2020 15:54, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		97.3	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201208A9.1960603N, Parent Sample ID: 201208A9.1960602M

Run in Batch: 201208A9, Run Date: 12/08/2020 16:19, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		105.3	70.0	130.0	7.9	30.0

Merit Laboratories Login Checklist

Lab Set ID: S19606
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 Tash 04700 / RACER Lansing
Submitted: 12/02/2020 16:50 Login User: REJ

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S19606 Submitted: 12/02/2020 16:50

Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30042872 Tash 04700 / RACER Lansing

Initial Preservation Check: 12/02/2020 17:58 REJ

Preservation Recheck (E200.8): N/A

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S19606.09	250ml Plastic H2SO4	<2			
S19606.11	250ml Plastic H2SO4	<2			

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 2

134629

Plant 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive Suite 500
CITY: Novi STATE: ZIP CODE:
PHONE NO.: 248 994 2240 FAX NO: P.O. NO:
E-MAIL ADDRESS: Tiffany.Linder@Arcadis.com QUOTE NO:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 Task 04700 / Racer Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	DATE (3 YEAR)	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane 8260B SIM	Nitrate-N E300.0	TKN SM4500-NorgB	Total Phosphorus SM4500-P E	Special Instructions
19600601	12-1-20	1100	MW-116-74_120120	GW	9		9						X				MS/MSD
04 02	12-1-20	1235	MW-116-84_120120	GW	3		3						X				
05 03	12-1-20	1435	MW-17-86_120120	GW	3		3						X				
06 04	12-1-20	1555	MW-19-115_120120	GW	3		3						X				
07 05	12-2-20	0955	MW-19-116_120220	GW	3		3						X				
08 06	12-2-20	AM	DUP-01	GW	3		3						X				
09 07	12-2-20	1125	MW-14-61_120220	GW	5		1 3		1				X	X	X	X	
10 08	12-2-20	1245	MW-19-120_120220	GW	3		3						X				
11 09	12-2-20	1425	MW-19-121_120220	GW	5		1 3		1				X	X	X	X	
12 10	12-2-20	1545	MW-19-117_120220	GW	3		3						X				

RELINQUISHED BY: SIGNATURE/ORGANIZATION	Arcadis ☒ Sampler	DATE 12-2-20	TIME 1650
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/2/20	TIME 1650
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
SEAL NO	SEAL INTACT YES☐ NO☐	INITIALS	
SEAL NO	SEAL INTACT YES☐ NO☐	INITIALS	

NOTES: 2-2 TEMP ON ARRIVAL:

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Analytical Laboratory Report

Report ID: S19607.01(01)+QC01
Generated on 12/09/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19607.01-S19607.04
Project: 30042872 / Racer Lansing
Collected Date(s): 12/01/2020 - 12/02/2020
Submitted Date/Time: 12/02/2020 16:50
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

Table of Contents

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19607.01	Trip Blank_120120	Water	12/01/20 00:01
S19607.02	MW-17-86_120120	Groundwater	12/01/20 14:35
S19607.03	MW-14-61_120220	Groundwater	12/02/20 11:25
S19607.04	MW-19-120_120220	Groundwater	12/02/20 12:45

Lab Sample ID: S19607.01
Sample Tag: Trip Blank_120120
Collected Date/Time: 12/01/2020 00:01
Matrix: Water
COC Reference: 134630

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 11:50	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/09/20 00:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S19607.01 (continued)
Sample Tag: Trip Blank_120120

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/09/20 00:51, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S19607.02
Sample Tag: MW-17-86_120120
Collected Date/Time: 12/01/2020 14:35
Matrix: Groundwater
COC Reference: 134630

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 11:50	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/09/20 01:14, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	12	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S19607.02 (continued)
Sample Tag: MW-17-86_120120

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/09/20 01:14, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S19607.03
Sample Tag: MW-14-61_120220
Collected Date/Time: 12/02/2020 11:25
Matrix: Groundwater
COC Reference: 134630

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 11:50	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/09/20 01:37, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S19607.03 (continued)
Sample Tag: MW-14-61_120220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/09/20 01:37, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S19607.04
Sample Tag: MW-19-120_120220
Collected Date/Time: 12/02/2020 12:45
Matrix: Groundwater
COC Reference: 134630

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/09/20 11:50	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/09/20 02:00, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S19607.04 (continued)
Sample Tag: MW-19-120_120220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/09/20 02:00, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Quality Control Report

Report ID: S19607.01(01)+QC01
Generated on 12/09/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19607.01-S19607.04
Project: 30042872 / Racer Lansing
Submitted Date/Time: 12/02/2020 16:50
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

QC Report Sections

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Prep Batch Summary (Page 19)
Surrogates per Lab Sample (Pages 20-23)
Surrogates per QC Sample (Page 24)
Internal Standards per Lab Sample (Pages 25-28)
Internal Standards per QC Sample (Page 29)
Batch QC Results (Pages 30-34)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S19607.01
Sample Tag: Trip Blank_120120
Collected Date/Time: 12/01/2020 00:01
Matrix: Water
COC Reference: 134630

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	12/09/20 00:51	201208B7	VF201208W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S19607.02
Sample Tag: MW-17-86_120120
Collected Date/Time: 12/01/2020 14:35
Matrix: Groundwater
COC Reference: 134630

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	12/09/20 01:14	201208B7	VF201208W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S19607.03
Sample Tag: MW-14-61_120220
Collected Date/Time: 12/02/2020 11:25
Matrix: Groundwater
COC Reference: 134630

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	12/09/20 01:37	201208B7	VF201208W2	Yes	BLK/LCS/LCSD

Lab Sample ID: S19607.04
Sample Tag: MW-19-120_120220
Collected Date/Time: 12/02/2020 12:45
Matrix: Groundwater
COC Reference: 134630

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	12/09/20 02:00	201208B7	VF201208W2	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF201208W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19607.01	Volatile Organics - DEQ List	SW5030C/8260C	12/09/20 00:51	201208B7
S19607.02	Volatile Organics - DEQ List	SW5030C/8260C	12/09/20 01:14	201208B7
S19607.03	Volatile Organics - DEQ List	SW5030C/8260C	12/09/20 01:37	201208B7
S19607.04	Volatile Organics - DEQ List	SW5030C/8260C	12/09/20 02:00	201208B7

QC Report - Surrogates per Lab Sample

Lab Sample ID: S19607.01

Sample Tag: Trip Blank_120120

Collected Date/Time: 12/01/2020 00:01

Matrix: Water

COC Reference: 134630

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201208B7, Run Date: 12/09/2020 00:51, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.9**	80.0	124.0
1,2-Dichloroethane-D4		**90.3**	72.0	125.0
Toluene-D8		**92.1**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S19607.02

Sample Tag: MW-17-86_120120

Collected Date/Time: 12/01/2020 14:35

Matrix: Groundwater

COC Reference: 134630

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201208B7, Run Date: 12/09/2020 01:14, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.3**	80.0	124.0
1,2-Dichloroethane-D4		**91.0**	72.0	125.0
Toluene-D8		**91.4**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S19607.03

Sample Tag: MW-14-61_120220

Collected Date/Time: 12/02/2020 11:25

Matrix: Groundwater

COC Reference: 134630

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201208B7, Run Date: 12/09/2020 01:37, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.5**	80.0	124.0
1,2-Dichloroethane-D4		**90.7**	72.0	125.0
Toluene-D8		**91.1**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S19607.04

Sample Tag: MW-19-120_120220

Collected Date/Time: 12/02/2020 12:45

Matrix: Groundwater

COC Reference: 134630

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201208B7, Run Date: 12/09/2020 02:00, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.7**	80.0	124.0
1,2-Dichloroethane-D4		**92.5**	72.0	125.0
Toluene-D8		**91.8**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF201208W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201208B7.BLKW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 23:18, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**93.2**	80.0	124.0
1,2-Dichloroethane-D4		**86.8**	72.0	125.0
Toluene-D8		**91.2**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201208B7.LCSW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 22:09, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**93.2**	80.0	124.0
1,2-Dichloroethane-D4		**88.3**	72.0	125.0
Toluene-D8		**92.7**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208B7.LCSDW08C, Parent Sample ID: 201208B7.LCSW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 22:32, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**91.6**	80.0	124.0
1,2-Dichloroethane-D4		**91.2**	72.0	125.0
Toluene-D8		**91.5**	89.0	112.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19607.01

Sample Tag: Trip Blank_120120

Collected Date/Time: 12/01/2020 00:01

Matrix: Water

COC Reference: 134630

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201208B7, Run Date: 12/09/2020 00:51, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**99.4**	50.0	200.0
1,4-Difluorobenzene		**99.2**	50.0	200.0
Chlorobenzene-D5		**100.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**103.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19607.02

Sample Tag: MW-17-86_120120

Collected Date/Time: 12/01/2020 14:35

Matrix: Groundwater

COC Reference: 134630

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201208B7, Run Date: 12/09/2020 01:14, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**99.3**	50.0	200.0
1,4-Difluorobenzene		**98.4**	50.0	200.0
Chlorobenzene-D5		**100.0**	50.0	200.0
1,4-Dichlorobenzene-D4		**103.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19607.03

Sample Tag: MW-14-61_120220

Collected Date/Time: 12/02/2020 11:25

Matrix: Groundwater

COC Reference: 134630

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201208B7, Run Date: 12/09/2020 01:37, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**100.2**	50.0	200.0
1,4-Difluorobenzene		**99.9**	50.0	200.0
Chlorobenzene-D5		**100.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**103.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19607.04

Sample Tag: MW-19-120_120220

Collected Date/Time: 12/02/2020 12:45

Matrix: Groundwater

COC Reference: 134630

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201208B7, Run Date: 12/09/2020 02:00, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**100.2**	50.0	200.0
1,4-Difluorobenzene		**100.3**	50.0	200.0
Chlorobenzene-D5		**101.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**104.5**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF201208W2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201208B7.BLKW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 23:18, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**98.0**	50.0	200.0
1,4-Difluorobenzene		**97.9**	50.0	200.0
Chlorobenzene-D5		**98.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**98.9**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201208B7.LCSW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 22:09, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.8**	50.0	200.0
1,4-Difluorobenzene		**100.8**	50.0	200.0
Chlorobenzene-D5		**101.8**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.8**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208B7.LCSDW08C, Parent Sample ID: 201208B7.LCSW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 22:32, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**99.5**	50.0	200.0
1,4-Difluorobenzene		**99.4**	50.0	200.0
Chlorobenzene-D5		**99.9**	50.0	200.0
1,4-Dichlorobenzene-D4		**97.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF201208W2

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201208B7.BLKW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 23:18, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF201208W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 201208B7.BLKW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 23:18, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201208B7.LCSW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 22:09, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		106.7	67.4	121.2
Acetone		112.8	29.9	161.5
Methyl iodide		104.1	68.8	116.4
Carbon disulfide		104.4	63.8	137.4
tert-Methyl butyl ether (MTBE)		100.9	73.2	122.4
Acrylonitrile		108.7	69.9	128.9
2-Butanone (MEK)		101.4	44.0	134.4
Dichlorodifluoromethane		103.9	10.0	222.8
Chloromethane		103.0	23.8	166.5
Vinyl chloride		100.8	43.5	149.1
Bromomethane		96.8	56.8	151.3
Chloroethane		98.4	53.4	149.4
Trichlorofluoromethane		103.4	59.7	151.8
1,1-Dichloroethene		106.6	69.6	139.4
Methylene chloride		99.8	73.3	121.1
trans-1,2-Dichloroethene		101.3	73.6	129.3
1,1-Dichloroethane		100.0	71.5	126.2
cis-1,2-Dichloroethene		95.7	76.6	122.1
Tetrahydrofuran		101.6	59.0	117.9
Chloroform		99.0	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF201208W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 201208B7.LCSW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 22:09, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		96.6	78.2	120.8
1,1,1-Trichloroethane		102.5	79.4	130.9
4-Methyl-2-pentanone (MIBK)		100.8	71.6	125.2
2-Hexanone		101.6	55.4	136.9
Carbon tetrachloride		99.3	72.6	133.0
Benzene		96.3	79.9	124.9
1,2-Dichloroethane		94.3	76.0	126.3
Trichloroethene		98.1	79.7	124.2
1,2-Dichloropropane		101.4	78.6	126.4
Bromodichloromethane		98.3	80.4	128.2
Dibromomethane		96.5	76.9	122.1
cis-1,3-Dichloropropene		98.0	79.8	129.9
Toluene		97.7	79.8	124.5
trans-1,3-Dichloropropene		98.7	74.0	131.3
1,1,2-Trichloroethane		97.5	78.7	123.1
Tetrachloroethene		105.3	74.5	124.5
trans-1,4-Dichloro-2-butene		79.4	68.6	135.4
Dibromochloromethane		99.0	74.6	127.2
1,2-Dibromoethane		96.7	70.3	133.7
Chlorobenzene		96.3	79.2	122.7
1,1,1,2-Tetrachloroethane		99.5	80.3	128.2
Ethylbenzene		98.5	79.5	129.1
p,m-Xylene		97.9	79.4	132.2
o-Xylene		98.6	80.2	131.0
Styrene		95.7	69.5	126.7
Isopropylbenzene		100.1	74.4	121.5
Bromoform		97.5	69.4	128.0
1,1,2,2-Tetrachloroethane		100.1	79.8	126.3
1,2,3-Trichloropropane		98.2	78.3	138.8
n-Propylbenzene		99.2	82.0	130.7
Bromobenzene		96.4	78.7	124.6
1,3,5-Trimethylbenzene		99.9	81.3	128.9
tert-Butylbenzene		99.9	80.7	128.9
1,2,4-Trimethylbenzene		98.9	81.4	130.8
sec-Butylbenzene		101.4	77.4	129.8
p-Isopropyltoluene		101.5	79.8	137.5
1,3-Dichlorobenzene		96.9	77.0	131.3
1,4-Dichlorobenzene		95.3	20.7	137.7
1,2-Dichlorobenzene		98.5	10.0	166.2
1,2,3-Trimethylbenzene		101.1	76.3	124.2
n-Butylbenzene		99.3	80.0	133.3
Hexachloroethane		99.6	23.8	138.1
1,2-Dibromo-3-chloropropane		106.3	21.2	189.4
1,2,4-Trichlorobenzene		102.1	27.4	143.4
1,2,3-Trichlorobenzene		103.0	75.4	131.4
Naphthalene		101.8	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF201208W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 201208B7.LCSW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 22:09, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		107.1	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201208B7.LCSDW08C, Parent Sample ID: 201208B7.LCSW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 22:32, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		104.6	67.4	121.2	2.0	30.0
Acetone		111.0	29.9	161.5	1.6	30.0
Methyl iodide		103.5	68.8	116.4	0.6	30.0
Carbon disulfide		104.5	63.8	137.4	0.1	30.0
tert-Methyl butyl ether (MTBE)		99.5	73.2	122.4	1.5	30.0
Acrylonitrile		108.4	69.9	128.9	0.3	30.0
2-Butanone (MEK)		102.1	44.0	134.4	0.7	30.0
Dichlorodifluoromethane		102.6	10.0	222.8	1.2	30.0
Chloromethane		101.5	23.8	166.5	1.5	30.0
Vinyl chloride		100.3	43.5	149.1	0.5	30.0
Bromomethane		96.3	56.8	151.3	0.5	30.0
Chloroethane		97.6	53.4	149.4	0.8	30.0
Trichlorofluoromethane		103.9	59.7	151.8	0.4	30.0
1,1-Dichloroethene		106.5	69.6	139.4	0.2	30.0
Methylene chloride		98.9	73.3	121.1	0.9	30.0
trans-1,2-Dichloroethene		100.9	73.6	129.3	0.3	30.0
1,1-Dichloroethane		100.1	71.5	126.2	0.1	30.0
cis-1,2-Dichloroethene		95.4	76.6	122.1	0.3	30.0
Tetrahydrofuran		100.6	59.0	117.9	1.0	30.0
Chloroform		98.2	78.4	124.0	0.9	30.0
Bromochloromethane		97.0	78.2	120.8	0.4	30.0
1,1,1-Trichloroethane		102.3	79.4	130.9	0.3	30.0
4-Methyl-2-pentanone (MIBK)		100.9	71.6	125.2	0.1	30.0
2-Hexanone		101.2	55.4	136.9	0.4	30.0
Carbon tetrachloride		99.7	72.6	133.0	0.4	30.0
Benzene		96.1	79.9	124.9	0.2	30.0
1,2-Dichloroethane		93.3	76.0	126.3	1.1	30.0
Trichloroethene		97.2	79.7	124.2	0.9	30.0
1,2-Dichloropropane		100.6	78.6	126.4	0.8	30.0
Bromodichloromethane		97.3	80.4	128.2	1.1	30.0
Dibromomethane		95.9	76.9	122.1	0.6	30.0
cis-1,3-Dichloropropene		95.8	79.8	129.9	2.3	30.0
Toluene		96.4	79.8	124.5	1.3	30.0
trans-1,3-Dichloropropene		97.0	74.0	131.3	1.8	30.0
1,1,2-Trichloroethane		94.5	78.7	123.1	3.1	30.0
Tetrachloroethene		96.3	74.5	124.5	8.9	30.0
trans-1,4-Dichloro-2-butene		80.4	68.6	135.4	1.2	30.0
Dibromochloromethane		96.8	74.6	127.2	2.2	30.0
1,2-Dibromoethane		95.6	70.3	133.7	1.2	30.0
Chlorobenzene		95.4	79.2	122.7	0.9	30.0

Organics - Volatiles, Prep Batch ID: VF201208W2 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 201208B7.LCSDW08C, Parent Sample ID: 201208B7.LCSW08C

Run in Batch: 201208B7, Run Date: 12/08/2020 22:32, Prep Date: 12/08/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		98.9	80.3	128.2	0.7	30.0
Ethylbenzene		96.6	79.5	129.1	1.9	30.0
p,m-Xylene		96.9	79.4	132.2	1.1	30.0
o-Xylene		98.6	80.2	131.0	0.0	30.0
Styrene		94.9	69.5	126.7	0.9	30.0
Isopropylbenzene		99.7	74.4	121.5	0.4	30.0
Bromoform		97.1	69.4	128.0	0.4	30.0
1,1,2,2-Tetrachloroethane		99.1	79.8	126.3	0.9	30.0
1,2,3-Trichloropropane		99.2	78.3	138.8	1.1	30.0
n-Propylbenzene		97.5	82.0	130.7	1.8	30.0
Bromobenzene		95.3	78.7	124.6	1.2	30.0
1,3,5-Trimethylbenzene		99.7	81.3	128.9	0.1	30.0
tert-Butylbenzene		98.8	80.7	128.9	1.2	30.0
1,2,4-Trimethylbenzene		98.6	81.4	130.8	0.3	30.0
sec-Butylbenzene		103.0	77.4	129.8	1.5	30.0
p-Isopropyltoluene		103.3	79.8	137.5	1.7	30.0
1,3-Dichlorobenzene		97.9	77.0	131.3	1.0	30.0
1,4-Dichlorobenzene		95.9	20.7	137.7	0.6	30.0
1,2-Dichlorobenzene		99.9	10.0	166.2	1.5	30.0
1,2,3-Trimethylbenzene		101.9	76.3	124.2	0.8	30.0
n-Butylbenzene		100.2	80.0	133.3	0.9	30.0
Hexachloroethane		100.5	23.8	138.1	0.8	30.0
1,2-Dibromo-3-chloropropane		107.4	21.2	189.4	1.0	30.0
1,2,4-Trichlorobenzene		102.4	27.4	143.4	0.3	30.0
1,2,3-Trichlorobenzene		103.8	75.4	131.4	0.8	30.0
Naphthalene		103.5	32.9	135.8	1.6	30.0
2-Methylnaphthalene		108.2	25.5	165.5	1.1	30.0

Merit Laboratories Login Checklist

Lab Set ID: S19607
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / Racer Lansing
Submitted: 12/02/2020 16:50 Login User: REJ

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 3 1

134630

Plant 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28500 Cabot Dr Suite 600
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 994 2240 FAX NO:
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com
P.O. NO.:
QUOTE NO:

INVOICE TO

CONTACT NAME: ☐ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872 / Racer Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pisarkiewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☒ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR	DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs Bldg 8 SVMs	Special Instructions
190007	13	12-1-20	~~1700~~	Trip Blank	L	1		1						X	190007-01
MW-17-12	13	12-1-20	1435	MW-17-86-120120	GW	3		3						X	-02
MW-14-13	13	12-2-20	1125	MW-14-61-120220	GW	3		3						X	-03
MW-19-14	13	12-2-20	1245	MW-19-120-120220	GW	3		3						X	-04

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

Special Instructions

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
[signature] Arcadis	12-2-20	1650
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
[signature]	12/2/20	1650
RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP ON ARRIVAL: 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Analytical Laboratory Report

Report ID: S19673.01(01)+QC01
Generated on 12/11/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19673.01-S19673.03
Project: 30042872.04700 / Racer Lansing
Collected Date(s): 12/03/2020
Submitted Date/Time: 12/03/2020 16:20
Sampled by: Austin Westhuis
P.O. #: 30042872.04700

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QC Report (Pages 12-29)

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003

Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19673.01	MW-20-131_120220	Groundwater	12/03/20 10:05
S19673.02	MW-20-132_120220	Groundwater	12/03/20 10:50
S19673.03	Trip Blank_120220	Water	12/03/20 00:01

Lab Sample ID: S19673.01
Sample Tag: MW-20-131_120220
Collected Date/Time: 12/03/2020 10:05
Matrix: Groundwater
COC Reference: 132266

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/10/20 20:18, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	3	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	3	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S19673.01 (continued)
Sample Tag: MW-20-131_120220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/10/20 20:18, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Lab Sample ID: S19673.02
Sample Tag: MW-20-132_120220
Collected Date/Time: 12/03/2020 10:50
Matrix: Groundwater
COC Reference: 132266

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/10/20 20:41, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	1	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	9	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S19673.02 (continued)
Sample Tag: MW-20-132_120220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/10/20 20:41, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Analytical Laboratory Report

Lab Sample ID: S19673.03
Sample Tag: Trip Blank_120220
Collected Date/Time: 12/03/2020 00:01
Matrix: Water
COC Reference: 132266

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/10/20 15:41, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	

Lab Sample ID: S19673.03 (continued)
Sample Tag: Trip Blank_120220

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/10/20 15:41, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	

Quality Control Report

Report ID: S19673.01(01)+QC01
Generated on 12/11/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19673.01-S19673.03
Project: 30042872.04700 / Racer Lansing
Submitted Date/Time: 12/03/2020 16:20
Sampled by: Austin Westhuis
P.O. #: 30042872.04700

QC Report Sections

Cover Page (Page 12)
Analysis Summary (Pages 13-15)
Prep Batch Summary (Page 16)
Surrogates per Lab Sample (Pages 17-19)
Surrogates per QC Sample (Page 20)
Internal Standards per Lab Sample (Pages 21-23)
Internal Standards per QC Sample (Page 24)
Batch QC Results (Pages 25-29)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S19673.01
Sample Tag: MW-20-131_120220
Collected Date/Time: 12/03/2020 10:05
Matrix: Groundwater
COC Reference: 132266

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	12/10/20 20:18	201210A7	VF201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19673.02
Sample Tag: MW-20-132_120220
Collected Date/Time: 12/03/2020 10:50
Matrix: Groundwater
COC Reference: 132266

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	12/10/20 20:41	201210A7	VF201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19673.03

Sample Tag: Trip Blank_120220

Collected Date/Time: 12/03/2020 00:01

Matrix: Water

COC Reference: 132266

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	12/10/20 15:41	201210A7	VF201210W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF201210W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19673.01	Volatile Organics - DEQ List	SW5030C/8260C	12/10/20 20:18	201210A7
S19673.02	Volatile Organics - DEQ List	SW5030C/8260C	12/10/20 20:41	201210A7
S19673.03	Volatile Organics - DEQ List	SW5030C/8260C	12/10/20 15:41	201210A7

QC Report - Surrogates per Lab Sample

Lab Sample ID: S19673.01

Sample Tag: MW-20-131_120220

Collected Date/Time: 12/03/2020 10:05

Matrix: Groundwater

COC Reference: 132266

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201210A7, Run Date: 12/10/2020 20:18, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**95.3**	80.0	124.0
1,2-Dichloroethane-D4		**97.0**	72.0	125.0
Toluene-D8		**92.0**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S19673.02

Sample Tag: MW-20-132_120220

Collected Date/Time: 12/03/2020 10:50

Matrix: Groundwater

COC Reference: 132266

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201210A7, Run Date: 12/10/2020 20:41, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**94.8**	80.0	124.0
1,2-Dichloroethane-D4		**92.7**	72.0	125.0
Toluene-D8		**92.1**	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S19673.03

Sample Tag: Trip Blank_120220

Collected Date/Time: 12/03/2020 00:01

Matrix: Water

COC Reference: 132266

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201210A7, Run Date: 12/10/2020 15:41, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
4-Bromofluorobenzene		**96.1**	80.0	124.0
1,2-Dichloroethane-D4		**91.5**	72.0	125.0
Toluene-D8		**91.1**	89.0	112.0

Organics - Volatiles, Prep Batch ID: VF201210W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A7.BLKW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 14:07, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**94.2**	80.0	124.0
1,2-Dichloroethane-D4		**87.4**	72.0	125.0
Toluene-D8		**91.4**	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A7.LCSW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 12:32, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**94.3**	80.0	124.0
1,2-Dichloroethane-D4		**87.9**	72.0	125.0
Toluene-D8		**92.2**	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A7.LCSDW10B, Parent Sample ID: 201210A7.LCSW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 13:21, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		**93.8**	80.0	124.0
1,2-Dichloroethane-D4		**85.3**	72.0	125.0
Toluene-D8		**92.5**	89.0	112.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19673.01

Sample Tag: MW-20-131_120220

Collected Date/Time: 12/03/2020 10:05

Matrix: Groundwater

COC Reference: 132266

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201210A7, Run Date: 12/10/2020 20:18, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**88.1**	50.0	200.0
1,4-Difluorobenzene		**89.7**	50.0	200.0
Chlorobenzene-D5		**92.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**96.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19673.02

Sample Tag: MW-20-132_120220

Collected Date/Time: 12/03/2020 10:50

Matrix: Groundwater

COC Reference: 132266

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201210A7, Run Date: 12/10/2020 20:41, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**89.6**	50.0	200.0
1,4-Difluorobenzene		**90.8**	50.0	200.0
Chlorobenzene-D5		**92.5**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19673.03

Sample Tag: Trip Blank_120220

Collected Date/Time: 12/03/2020 00:01

Matrix: Water

COC Reference: 132266

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 201210A7, Run Date: 12/10/2020 15:41, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
Pentafluorobenzene		**93.9**	50.0	200.0
1,4-Difluorobenzene		**94.2**	50.0	200.0
Chlorobenzene-D5		**94.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**98.1**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF201210W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A7.BLKW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 14:07, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**94.0**	50.0	200.0
1,4-Difluorobenzene		**94.4**	50.0	200.0
Chlorobenzene-D5		**94.3**	50.0	200.0
1,4-Dichlorobenzene-D4		**95.7**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A7.LCSW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 12:32, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**100.4**	50.0	200.0
1,4-Difluorobenzene		**100.5**	50.0	200.0
Chlorobenzene-D5		**101.1**	50.0	200.0
1,4-Dichlorobenzene-D4		**100.5**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A7.LCSDW10B, Parent Sample ID: 201210A7.LCSW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 13:21, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		**95.5**	50.0	200.0
1,4-Difluorobenzene		**95.6**	50.0	200.0
Chlorobenzene-D5		**95.6**	50.0	200.0
1,4-Dichlorobenzene-D4		**94.3**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VF201210W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A7.BLKW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 14:07, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

Organics - Volatiles, Prep Batch ID: VF201210W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 201210A7.BLKW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 14:07, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A7.LCSW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 12:32, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		98.9	67.4	121.2
Acetone		116.8	29.9	161.5
Methyl iodide		94.3	68.8	116.4
Carbon disulfide		92.8	63.8	137.4
tert-Methyl butyl ether (MTBE)		96.5	73.2	122.4
Acrylonitrile		108.8	69.9	128.9
2-Butanone (MEK)		106.8	44.0	134.4
Dichlorodifluoromethane		92.7	10.0	222.8
Chloromethane		88.5	23.8	166.5
Vinyl chloride		88.4	43.5	149.1
Bromomethane		88.1	56.8	151.3
Chloroethane		87.1	53.4	149.4
Trichlorofluoromethane		89.8	59.7	151.8
1,1-Dichloroethene		94.1	69.6	139.4
Methylene chloride		92.5	73.3	121.1
trans-1,2-Dichloroethene		91.2	73.6	129.3
1,1-Dichloroethane		90.9	71.5	126.2
cis-1,2-Dichloroethene		87.7	76.6	122.1
Tetrahydrofuran		104.5	59.0	117.9
Chloroform		90.7	78.4	124.0

Organics - Volatiles, Prep Batch ID: VF201210W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 201210A7.LCSW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 12:32, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		90.6	78.2	120.8
1,1,1-Trichloroethane		90.5	79.4	130.9
4-Methyl-2-pentanone (MIBK)		103.1	71.6	125.2
2-Hexanone		103.4	55.4	136.9
Carbon tetrachloride		88.7	72.6	133.0
Benzene		88.6	79.9	124.9
1,2-Dichloroethane		88.7	76.0	126.3
Trichloroethene		88.6	79.7	124.2
1,2-Dichloropropane		94.2	78.6	126.4
Bromodichloromethane		92.8	80.4	128.2
Dibromomethane		91.7	76.9	122.1
cis-1,3-Dichloropropene		93.9	79.8	129.9
Toluene		89.4	79.8	124.5
trans-1,3-Dichloropropene		95.0	74.0	131.3
1,1,2-Trichloroethane		92.1	78.7	123.1
Tetrachloroethene		87.0	74.5	124.5
trans-1,4-Dichloro-2-butene		108.3	68.6	135.4
Dibromochloromethane		94.4	74.6	127.2
1,2-Dibromoethane		90.2	70.3	133.7
Chlorobenzene		88.5	79.2	122.7
1,1,1,2-Tetrachloroethane		92.7	80.3	128.2
Ethylbenzene		88.1	79.5	129.1
p,m-Xylene		89.1	79.4	132.2
o-Xylene		90.3	80.2	131.0
Styrene		89.1	69.5	126.7
Isopropylbenzene		89.6	74.4	121.5
Bromoform		96.4	69.4	128.0
1,1,2,2-Tetrachloroethane		94.4	79.8	126.3
1,2,3-Trichloropropane		95.3	78.3	138.8
n-Propylbenzene		89.0	82.0	130.7
Bromobenzene		89.2	78.7	124.6
1,3,5-Trimethylbenzene		91.0	81.3	128.9
tert-Butylbenzene		90.0	80.7	128.9
1,2,4-Trimethylbenzene		90.7	81.4	130.8
sec-Butylbenzene		90.6	77.4	129.8
p-Isopropyltoluene		92.5	79.8	137.5
1,3-Dichlorobenzene		89.7	77.0	131.3
1,4-Dichlorobenzene		87.5	20.7	137.7
1,2-Dichlorobenzene		90.8	10.0	166.2
1,2,3-Trimethylbenzene		94.2	76.3	124.2
n-Butylbenzene		90.5	80.0	133.3
Hexachloroethane		96.4	23.8	138.1
1,2-Dibromo-3-chloropropane		104.5	21.2	189.4
1,2,4-Trichlorobenzene		97.6	27.4	143.4
1,2,3-Trichlorobenzene		98.5	75.4	131.4
Naphthalene		98.2	32.9	135.8

Organics - Volatiles, Prep Batch ID: VF201210W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 201210A7.LCSW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 12:32, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		105.0	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A7.LCSDW10B, Parent Sample ID: 201210A7.LCSW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 13:21, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		98.7	67.4	121.2	0.2	30.0
Acetone		123.0	29.9	161.5	5.2	30.0
Methyl iodide		98.0	68.8	116.4	3.8	30.0
Carbon disulfide		100.2	63.8	137.4	7.6	30.0
tert-Methyl butyl ether (MTBE)		93.5	73.2	122.4	3.1	30.0
Acrylonitrile		109.6	69.9	128.9	0.7	30.0
2-Butanone (MEK)		108.0	44.0	134.4	1.1	30.0
Dichlorodifluoromethane		81.0	10.0	222.8	13.4	30.0
Chloromethane		85.7	23.8	166.5	3.2	30.0
Vinyl chloride		90.0	43.5	149.1	1.7	30.0
Bromomethane		87.4	56.8	151.3	0.8	30.0
Chloroethane		89.4	53.4	149.4	2.6	30.0
Trichlorofluoromethane		95.5	59.7	151.8	6.2	30.0
1,1-Dichloroethene		102.5	69.6	139.4	8.6	30.0
Methylene chloride		95.3	73.3	121.1	2.9	30.0
trans-1,2-Dichloroethene		98.0	73.6	129.3	7.2	30.0
1,1-Dichloroethane		96.2	71.5	126.2	5.7	30.0
cis-1,2-Dichloroethene		91.6	76.6	122.1	4.4	30.0
Tetrahydrofuran		104.3	59.0	117.9	0.2	30.0
Chloroform		94.6	78.4	124.0	4.3	30.0
Bromochloromethane		92.3	78.2	120.8	1.8	30.0
1,1,1-Trichloroethane		98.1	79.4	130.9	8.1	30.0
4-Methyl-2-pentanone (MIBK)		99.3	71.6	125.2	3.7	30.0
2-Hexanone		100.9	55.4	136.9	2.4	30.0
Carbon tetrachloride		97.5	72.6	133.0	9.5	30.0
Benzene		92.7	79.9	124.9	4.6	30.0
1,2-Dichloroethane		90.6	76.0	126.3	2.1	30.0
Trichloroethene		95.2	79.7	124.2	7.2	30.0
1,2-Dichloropropane		98.5	78.6	126.4	4.5	30.0
Bromodichloromethane		95.8	80.4	128.2	3.2	30.0
Dibromomethane		93.5	76.9	122.1	2.0	30.0
cis-1,3-Dichloropropene		97.6	79.8	129.9	3.9	30.0
Toluene		95.1	79.8	124.5	6.2	30.0
trans-1,3-Dichloropropene		99.5	74.0	131.3	4.6	30.0
1,1,2-Trichloroethane		94.1	78.7	123.1	2.1	30.0
Tetrachloroethene		93.5	74.5	124.5	7.2	30.0
trans-1,4-Dichloro-2-butene		107.6	68.6	135.4	0.7	30.0
Dibromochloromethane		96.8	74.6	127.2	2.6	30.0
1,2-Dibromoethane		94.0	70.3	133.7	4.1	30.0
Chlorobenzene		93.1	79.2	122.7	5.1	30.0

Organics - Volatiles, Prep Batch ID: VF201210W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 201210A7.LCSDW10B, Parent Sample ID: 201210A7.LCSW10A

Run in Batch: 201210A7, Run Date: 12/10/2020 13:21, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		96.1	80.3	128.2	3.6	30.0
Ethylbenzene		94.3	79.5	129.1	6.7	30.0
p,m-Xylene		95.0	79.4	132.2	6.4	30.0
o-Xylene		94.3	80.2	131.0	4.3	30.0
Styrene		92.8	69.5	126.7	4.1	30.0
Isopropylbenzene		96.5	74.4	121.5	7.4	30.0
Bromoform		98.8	69.4	128.0	2.5	30.0
1,1,2,2-Tetrachloroethane		97.6	79.8	126.3	3.3	30.0
1,2,3-Trichloropropane		95.5	78.3	138.8	0.2	30.0
n-Propylbenzene		96.3	82.0	130.7	7.8	30.0
Bromobenzene		92.9	78.7	124.6	4.1	30.0
1,3,5-Trimethylbenzene		97.1	81.3	128.9	6.5	30.0
tert-Butylbenzene		97.0	80.7	128.9	7.4	30.0
1,2,4-Trimethylbenzene		96.4	81.4	130.8	6.1	30.0
sec-Butylbenzene		98.5	77.4	129.8	8.3	30.0
p-Isopropyltoluene		100.1	79.8	137.5	7.9	30.0
1,3-Dichlorobenzene		94.3	77.0	131.3	4.9	30.0
1,4-Dichlorobenzene		91.9	20.7	137.7	4.9	30.0
1,2-Dichlorobenzene		94.9	10.0	166.2	4.4	30.0
1,2,3-Trimethylbenzene		94.8	76.3	124.2	0.6	30.0
n-Butylbenzene		99.7	80.0	133.3	9.7	30.0
Hexachloroethane		99.5	23.8	138.1	3.1	30.0
1,2-Dibromo-3-chloropropane		105.7	21.2	189.4	1.2	30.0
1,2,4-Trichlorobenzene		101.9	27.4	143.4	4.3	30.0
1,2,3-Trichlorobenzene		102.1	75.4	131.4	3.6	30.0
Naphthalene		99.7	32.9	135.8	1.5	30.0
2-Methylnaphthalene		103.6	25.5	165.5	1.3	30.0

Merit Laboratories Login Checklist

Lab Set ID: S19673
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / Racer Lansing
Submitted: 12/03/2020 16:20 Login User: REJ

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

132266

CHAIN OF CUSTODY RECORD Plant 6

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive, Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 810-225-1928 FAX NO: P.O. NO: 30042872.04700
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700 / RACER Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☒ Other MI

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs 8260B SIMS
19673.01	12/3/20	1005	MW-20-131_120320	GW	3		3						X
.02	12/3/20	1050	MW-20-132_120320	GW	3		3						X
.03	12/3/20	—	Trip Blank	GW	1		1						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis ☒ Sampler	DATE: 12/3/20	TIME: 1620	
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Storage	DATE: 12-3-20	TIME: 1620	
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DropOff	DATE: 12/3/20	TIME: 1620	
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE: 12/3/20	TIME: 1620	

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: TIME:

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL: 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Analytical Laboratory Report

Report ID: S19674.01(01)+QC01
Generated on 12/11/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19674.01-S19674.04
Project: 30042872 / Racer Lansing GWS
Collected Date(s): 12/03/2020
Submitted Date/Time: 12/03/2020 16:20
Sampled by: Donald Richmond
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19674.01	MW-20-126_120320	Groundwater	12/03/20 10:20
S19674.02	PW-14-02_120320	Groundwater	12/03/20 11:25
S19674.03	MW-20-129_120320	Groundwater	12/03/20 12:50
S19674.04	MW-20-128_120320	Groundwater	12/03/20 14:50

Lab Sample ID: S19674.01
Sample Tag: MW-20-126_120320
Collected Date/Time: 12/03/2020 10:20
Matrix: Groundwater
COC Reference: 094735

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 20:13, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	320	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S19674.02
Sample Tag: PW-14-02_120320
Collected Date/Time: 12/03/2020 11:25
Matrix: Groundwater
COC Reference: 094735

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 15:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	97	1		ug/L	1	123-91-1	

Lab Sample ID: S19674.03
Sample Tag: MW-20-129_120320
Collected Date/Time: 12/03/2020 12:50
Matrix: Groundwater
COC Reference: 094735

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 16:20, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	140	1		ug/L	1	123-91-1	

Lab Sample ID: S19674.04
Sample Tag: MW-20-128_120320
Collected Date/Time: 12/03/2020 14:50
Matrix: Groundwater
COC Reference: 094735

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 16:45, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	20	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S19674.01(01)+QC01
Generated on 12/11/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19674.01-S19674.04
Project: 30042872 / Racer Lansing GWS
Submitted Date/Time: 12/03/2020 16:20
Sampled by: Donald Richmond
P.O. #: 30042872

QC Report Sections

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Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S19674.01
Sample Tag: MW-20-126_120320
Collected Date/Time: 12/03/2020 10:20
Matrix: Groundwater
COC Reference: 094735

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 20:13	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19674.02
Sample Tag: PW-14-02_120320
Collected Date/Time: 12/03/2020 11:25
Matrix: Groundwater
COC Reference: 094735

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 15:54	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19674.03
Sample Tag: MW-20-129_120320
Collected Date/Time: 12/03/2020 12:50
Matrix: Groundwater
COC Reference: 094735

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 16:20	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19674.04
Sample Tag: MW-20-128_120320
Collected Date/Time: 12/03/2020 14:50
Matrix: Groundwater
COC Reference: 094735

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 16:45	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Organics - Volatiles, Prep Batch ID: VS201210W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19674.01	1,4-Dioxane	SW8260B - SIM	12/10/20 20:13	201210A9
S19674.02	1,4-Dioxane	SW8260B - SIM	12/10/20 15:54	201210A9
S19674.03	1,4-Dioxane	SW8260B - SIM	12/10/20 16:20	201210A9
S19674.04	1,4-Dioxane	SW8260B - SIM	12/10/20 16:45	201210A9

Organics - Volatiles, Prep Batch ID: VS201210W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19674.01

Sample Tag: MW-20-126_120320

Collected Date/Time: 12/03/2020 10:20

Matrix: Groundwater

COC Reference: 094735

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 20:13, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**92.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19674.02

Sample Tag: PW-14-02_120320

Collected Date/Time: 12/03/2020 11:25

Matrix: Groundwater

COC Reference: 094735

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 15:54, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**95.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19674.03

Sample Tag: MW-20-129_120320

Collected Date/Time: 12/03/2020 12:50

Matrix: Groundwater

COC Reference: 094735

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 16:20, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**93.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19674.04

Sample Tag: MW-20-128_120320

Collected Date/Time: 12/03/2020 14:50

Matrix: Groundwater

COC Reference: 094735

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 16:45, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**98.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201210W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.2**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**93.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201210W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.3	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		109.4	70.0	130.0	6.8	30.0

Merit Laboratories Login Checklist

Lab Set ID: S19674
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / Racer Lansing GWS
Submitted: 12/03/2020 16:20 Login User: REJ

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

094735

Plant 2

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 517 861 0138 FAX NO: P.O. NO:
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872/RACER Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond/Don Rich

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☑ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane
19674-01	12/3/20	1020	MW-20-126_120320	GW	3		X						X
-02	12/3/20	1125	PW-14-02_120320	GW	3		X						X
-03	12/3/20	1250	MW-20-129_120320	GW	3		X						X
-04	12/3/20	1450	MW-20-128_120320	GW	3		X						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Don Rich/Arcadis ☒ Sampler DATE: 12/3/20 TIME: 1550
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 12-3-20 TIME: 1550
RELINQUISHED BY: SIGNATURE/ORGANIZATION: Fedex DATE: 12/3/20 TIME: 1620
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 12/3/20 TIME: 1620

RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: 12-3-20 TIME: 1620
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit storage DATE: 12-3-20 TIME: 1620

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP ON ARRIVAL: 3.0

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Analytical Laboratory Report

Report ID: S19675.01(01)+QC01
Generated on 12/11/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19675.01-S19675.07
Project: 30042872.04700 / Racer Lansing
Collected Date(s): 12/03/2020
Submitted Date/Time: 12/03/2020 16:20
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872.04700

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19675.01	MW-15-72_120320	Groundwater	12/03/20 09:55
S19675.02	MW-16-81_120320	Groundwater	12/03/20 11:30
S19675.03	DUP-02_120320	Groundwater	12/03/20 00:01
S19675.04	MW-19-122_120320	Groundwater	12/03/20 13:25
S19675.05	MW-19-123_120320	Groundwater	12/03/20 14:35
S19675.06	MW-20-130_120320	Groundwater	12/03/20 14:45
S19675.07	MW-19-124_120320	Groundwater	12/03/20 15:30

Analytical Laboratory Report

Lab Sample ID: S19675.01
Sample Tag: MW-15-72_120320
Collected Date/Time: 12/03/2020 09:55
Matrix: Groundwater
COC Reference: 134631

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 20:38, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	270	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S19675.02
Sample Tag: MW-16-81_120320
Collected Date/Time: 12/03/2020 11:30
Matrix: Groundwater
COC Reference: 134631

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 21:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1,930	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S19675.03
Sample Tag: DUP-02_120320
Collected Date/Time: 12/03/2020 00:01
Matrix: Groundwater
COC Reference: 134631

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 21:30, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1,070	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Analytical Laboratory Report

Lab Sample ID: S19675.04
Sample Tag: MW-19-122_120320
Collected Date/Time: 12/03/2020 13:25
Matrix: Groundwater
COC Reference: 134631

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 17:11, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	34	1		ug/L	1	123-91-1	

Lab Sample ID: S19675.05
Sample Tag: MW-19-123_120320
Collected Date/Time: 12/03/2020 14:35
Matrix: Groundwater
COC Reference: 134631

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 17:37, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	39	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S19675.06
Sample Tag: MW-20-130_120320
Collected Date/Time: 12/03/2020 14:45
Matrix: Groundwater
COC Reference: 134631

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 23:13, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	61	1		ug/L	1	123-91-1	

Lab Sample ID: S19675.07
Sample Tag: MW-19-124_120320
Collected Date/Time: 12/03/2020 15:30
Matrix: Groundwater
COC Reference: 134631

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.0	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 21:56, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	420	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Quality Control Report

Report ID: S19675.01(01)+QC01
Generated on 12/11/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19675.01-S19675.07
Project: 30042872.04700 / Racer Lansing
Submitted Date/Time: 12/03/2020 16:20
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872.04700

QC Report Sections

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Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S19675.01
Sample Tag: MW-15-72_120320
Collected Date/Time: 12/03/2020 09:55
Matrix: Groundwater
COC Reference: 134631

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 20:38	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19675.02
Sample Tag: MW-16-81_120320
Collected Date/Time: 12/03/2020 11:30
Matrix: Groundwater
COC Reference: 134631

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 21:04	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19675.03
Sample Tag: DUP-02_120320
Collected Date/Time: 12/03/2020 00:01
Matrix: Groundwater
COC Reference: 134631

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 21:30	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19675.04
Sample Tag: MW-19-122_120320
Collected Date/Time: 12/03/2020 13:25
Matrix: Groundwater
COC Reference: 134631

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 17:11	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19675.05
Sample Tag: MW-19-123_120320
Collected Date/Time: 12/03/2020 14:35
Matrix: Groundwater
COC Reference: 134631

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 17:37	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19675.06
Sample Tag: MW-20-130_120320
Collected Date/Time: 12/03/2020 14:45
Matrix: Groundwater
COC Reference: 134631

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 23:13	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19675.07
Sample Tag: MW-19-124_120320
Collected Date/Time: 12/03/2020 15:30
Matrix: Groundwater
COC Reference: 134631

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 21:56	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Organics - Volatiles, Prep Batch ID: VS201210W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19675.01	1,4-Dioxane	SW8260B - SIM	12/10/20 20:38	201210A9
S19675.02	1,4-Dioxane	SW8260B - SIM	12/10/20 21:04	201210A9
S19675.03	1,4-Dioxane	SW8260B - SIM	12/10/20 21:30	201210A9
S19675.04	1,4-Dioxane	SW8260B - SIM	12/10/20 17:11	201210A9
S19675.05	1,4-Dioxane	SW8260B - SIM	12/10/20 17:37	201210A9
S19675.06	1,4-Dioxane	SW8260B - SIM	12/10/20 23:13	201210A9
S19675.07	1,4-Dioxane	SW8260B - SIM	12/10/20 21:56	201210A9

Organics - Volatiles, Prep Batch ID: VS201210W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19675.01

Sample Tag: MW-15-72_120320

Collected Date/Time: 12/03/2020 09:55

Matrix: Groundwater

COC Reference: 134631

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 20:38, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**92.1**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19675.02

Sample Tag: MW-16-81_120320

Collected Date/Time: 12/03/2020 11:30

Matrix: Groundwater

COC Reference: 134631

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 21:04, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**93.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19675.03

Sample Tag: DUP-02_120320

Collected Date/Time: 12/03/2020 00:01

Matrix: Groundwater

COC Reference: 134631

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 21:30, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**93.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19675.04

Sample Tag: MW-19-122_120320

Collected Date/Time: 12/03/2020 13:25

Matrix: Groundwater

COC Reference: 134631

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 17:11, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**93.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19675.05

Sample Tag: MW-19-123_120320

Collected Date/Time: 12/03/2020 14:35

Matrix: Groundwater

COC Reference: 134631

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 17:37, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**97.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19675.06

Sample Tag: MW-20-130_120320

Collected Date/Time: 12/03/2020 14:45

Matrix: Groundwater

COC Reference: 134631

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 23:13, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**90.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19675.07

Sample Tag: MW-19-124_120320

Collected Date/Time: 12/03/2020 15:30

Matrix: Groundwater

COC Reference: 134631

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 21:56, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**89.1**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201210W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.2**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**93.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201210W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.3	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		109.4	70.0	130.0	6.8	30.0

Merit Laboratories Login Checklist

Lab Set ID: S19675
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / Racer Lansing
Submitted: 12/03/2020 16:20 Login User: REJ

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.0
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

134631

CHAIN OF CUSTODY RECORD

Plant 2

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr. Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 994 2240 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☑ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.0700 / Racer Landing
SAMPLER(S) PLEASE PRINT/SIGN NAME: Jake Pisarchiewicz / Arcadis

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane 8260B SIM									
196715.01	12-3-20	0955	MW-15-72_120320	GW	3		3						X									
.02	12-3-20	1130	MW-16-81_120320	GW	3		3						X									
.03	12-3-20	AM	Dup-02	GW	3		3						X									
.04	12-3-20	1325	MW-19-122_120320	GW	3		3						X									
.05	12-3-20	1435	MW-19-123_120320	GW	3		3						X									
.06	12/3/20	1445	MW-20-130_120320	GW	3		3						X									
.07	12-3-20	1530	MW-19-124_120320	GW	3		3						X									

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☑ Sampler	DATE 12-3-20	TIME 1620
RECEIVED BY: SIGNATURE/ORGANIZATION Merit storage		DATE 12-3-20	TIME 1620
RELINQUISHED BY: SIGNATURE/ORGANIZATION DHL/FDEX		DATE 12/3/20	TIME 1620
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/3/20	TIME 1620

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: 3.0
SEAL NO	SEAL INTACT YES ☐ NO ☐	INITIALS	TEMP. ON ARRIVAL

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Analytical Laboratory Report

Report ID: S19726.01(01)+QC01
Generated on 12/16/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19726.01-S19726.04
Project: 30042872.04700 / Racer Lansing
Collected Date(s): 12/04/2020
Submitted Date/Time: 12/04/2020 16:00
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872.04700

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Analytical Laboratory Report

Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19726.01	MW-13-43_120420	Groundwater	12/04/20 10:25
S19726.02	MW-13-45_120420	Groundwater	12/04/20 11:45
S19726.03	MW-16-75_120420	Groundwater	12/04/20 13:40
S19726.04	MW-16-77_120420	Groundwater	12/04/20 14:40

Lab Sample ID: S19726.01
Sample Tag: MW-13-43_120420
Collected Date/Time: 12/04/2020 10:25
Matrix: Groundwater
COC Reference: 134632

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/15/20 15:09, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	15	1		ug/L	1	123-91-1	

Lab Sample ID: S19726.02
Sample Tag: MW-13-45_120420
Collected Date/Time: 12/04/2020 11:45
Matrix: Groundwater
COC Reference: 134632

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 18:03, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	58	1		ug/L	1	123-91-1	

Lab Sample ID: S19726.03
Sample Tag: MW-16-75_120420
Collected Date/Time: 12/04/2020 13:40
Matrix: Groundwater
COC Reference: 134632

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 18:29, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S19726.04
Sample Tag: MW-16-77_120420
Collected Date/Time: 12/04/2020 14:40
Matrix: Groundwater
COC Reference: 134632

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 18:55, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S19726.01(01)+QC01
Generated on 12/16/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19726.01-S19726.04
Project: 30042872.04700 / Racer Lansing
Submitted Date/Time: 12/04/2020 16:00
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872.04700

QC Report Sections

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Analysis Summary (Pages 11-14)
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Internal Standards per QC Sample (Pages 22-23)
Batch QC Results (Pages 24-25)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S19726.01
Sample Tag: MW-13-43_120420
Collected Date/Time: 12/04/2020 10:25
Matrix: Groundwater
COC Reference: 134632

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/15/20 15:09	201215A9	VS201215W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19726.02
Sample Tag: MW-13-45_120420
Collected Date/Time: 12/04/2020 11:45
Matrix: Groundwater
COC Reference: 134632

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 18:03	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19726.03
Sample Tag: MW-16-75_120420
Collected Date/Time: 12/04/2020 13:40
Matrix: Groundwater
COC Reference: 134632

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 18:29	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19726.04
Sample Tag: MW-16-77_120420
Collected Date/Time: 12/04/2020 14:40
Matrix: Groundwater
COC Reference: 134632

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 18:55	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS201210W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19726.02	1,4-Dioxane	SW8260B - SIM	12/10/20 18:03	201210A9
S19726.03	1,4-Dioxane	SW8260B - SIM	12/10/20 18:29	201210A9
S19726.04	1,4-Dioxane	SW8260B - SIM	12/10/20 18:55	201210A9

Organics - Volatiles, Prep Batch ID: VS201215W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19726.01	1,4-Dioxane	SW8260B - SIM	12/15/20 15:09	201215A9

Organics - Volatiles, Prep Batch ID: VS201210W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS201215W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201215A9.BLKW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 14:43, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:14, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201215A9.LCSDW15A, Parent Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:39, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978305M, Parent Sample ID: S19783.04

Run in Batch: 201215A9, Run Date: 12/15/2020 13:04, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978402M, Parent Sample ID: S19784.01

Run in Batch: 201215A9, Run Date: 12/15/2020 13:54, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978306N, Parent Sample ID: 201215A9.1978305M

Run in Batch: 201215A9, Run Date: 12/15/2020 13:29, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978403N, Parent Sample ID: 201215A9.1978402M

Run in Batch: 201215A9, Run Date: 12/15/2020 14:19, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19726.01

Sample Tag: MW-13-43_120420

Collected Date/Time: 12/04/2020 10:25

Matrix: Groundwater

COC Reference: 134632

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201215A9, Run Date: 12/15/2020 15:09, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**99.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19726.02

Sample Tag: MW-13-45_120420

Collected Date/Time: 12/04/2020 11:45

Matrix: Groundwater

COC Reference: 134632

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 18:03, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**93.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19726.03

Sample Tag: MW-16-75_120420

Collected Date/Time: 12/04/2020 13:40

Matrix: Groundwater

COC Reference: 134632

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 18:29, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**89.7**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19726.04

Sample Tag: MW-16-77_120420

Collected Date/Time: 12/04/2020 14:40

Matrix: Groundwater

COC Reference: 134632

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 18:55, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**92.8**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201210W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.2**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**93.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201215W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201215A9.BLKW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 14:43, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**96.4**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:14, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**107.2**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201215A9.LCSDW15A, Parent Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:39, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**105.1**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978305M, Parent Sample ID: S19783.04

Run in Batch: 201215A9, Run Date: 12/15/2020 13:04, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**111.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978402M, Parent Sample ID: S19784.01

Run in Batch: 201215A9, Run Date: 12/15/2020 13:54, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**107.5**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978306N, Parent Sample ID: 201215A9.1978305M

Run in Batch: 201215A9, Run Date: 12/15/2020 13:29, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978403N, Parent Sample ID: 201215A9.1978402M

Run in Batch: 201215A9, Run Date: 12/15/2020 14:19, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201210W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.3	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		109.4	70.0	130.0	6.8	30.0

Organics - Volatiles, Prep Batch ID: VS201215W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201215A9.BLKW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 14:43, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:14, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		90.9	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201215A9.LCSDW15A, Parent Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:39, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		100.7	70.0	130.0	10.2	30.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978305M, Parent Sample ID: S19783.04

Run in Batch: 201215A9, Run Date: 12/15/2020 13:04, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.7	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978402M, Parent Sample ID: S19784.01

Run in Batch: 201215A9, Run Date: 12/15/2020 13:54, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		106.6	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978306N, Parent Sample ID: 201215A9.1978305M

Run in Batch: 201215A9, Run Date: 12/15/2020 13:29, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		97.1	70.0	130.0	8.3	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978403N, Parent Sample ID: 201215A9.1978402M

Run in Batch: 201215A9, Run Date: 12/15/2020 14:19, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		101.4	70.0	130.0	5.0	30.0

Merit Laboratories Login Checklist

Lab Set ID: S19726
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / Racer Lansing
Submitted: 12/04/2020 16:00 Login User: MMC

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.7
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

134632

CHAIN OF CUSTODY RECORD

Plant 2

REPORT TO

CONTACT NAME: ~~Arcadis~~ Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Drive Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 994 2240 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700 / Racer Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake Pischinski

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☐ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	8260B 1,4 Dioxane SIMS
197601	12.4.20	1025	MW-13-43_120420	GW	3		3						X
.02	12.4.20	1145	MW-13-45_120420	GW	3		3						X
.03	12.4.20	1340	MW-16-75_120420	GW	3		3						X
.04	12.4.20	1440	MW-16-77_120420	GW	3		3						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☐ Sampler	DATE 12.4.20	TIME 1600
RECEIVED BY: SIGNATURE/ORGANIZATION Merit Storage		DATE 12.4.20	TIME 1600
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION Merit Drop Box		DATE 12/4/2020	TIME 1600
RECEIVED BY: SIGNATURE/ORGANIZATION M Allcott		DATE 12/4/2020	TIME 1600
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

NOTES: TEMP. ON ARRIVAL 4.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Analytical Laboratory Report

Report ID: S19727.01(01)+QC01
Generated on 12/21/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19727.01-S19727.06
Project: 30042872 / Racer Lansing GWS
Collected Date(s): 12/04/2020
Submitted Date/Time: 12/04/2020 16:00
Sampled by: Donald Richmond
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (6 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19727.01	MW-16-80_120420	Groundwater	12/04/20 10:15
S19727.02	MW-16-80_120420 MS	Groundwater	12/04/20 10:15
S19727.03	MW-16-80_120420 MSD	Groundwater	12/04/20 10:15
S19727.04	PW-14-01_120420	Groundwater	12/04/20 11:45
S19727.05	MW-16-82_120420	Groundwater	12/04/20 12:55
S19727.06	MW-16-85_120420	Groundwater	12/04/20 14:30

Analytical Laboratory Report

Lab Sample ID: S19727.01
Sample Tag: MW-16-80_120420
Collected Date/Time: 12/04/2020 10:15
Matrix: Groundwater
COC Reference: 094731

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 15:28, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	28	1		ug/L	1	123-91-1	

Lab Sample ID: S19727.02
Sample Tag: MW-16-80_120420 MS
Collected Date/Time: 12/04/2020 10:15
Matrix: Groundwater
COC Reference: 094731

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 13:48, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	72	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S19727.03
Sample Tag: MW-16-80_120420 MSD
Collected Date/Time: 12/04/2020 10:15
Matrix: Groundwater
COC Reference: 094731

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 14:13, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	73	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S19727.04
Sample Tag: PW-14-01_120420
Collected Date/Time: 12/04/2020 11:45
Matrix: Groundwater
COC Reference: 094731

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 22:47, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	47	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Lab Sample ID: S19727.05
Sample Tag: MW-16-82_120420
Collected Date/Time: 12/04/2020 12:55
Matrix: Groundwater
COC Reference: 094731

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 19:20, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Analytical Laboratory Report

Lab Sample ID: S19727.06
Sample Tag: MW-16-85_120420
Collected Date/Time: 12/04/2020 14:30
Matrix: Groundwater
COC Reference: 094731

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.7	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/11/20 11:15	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/20 19:46, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	8	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S19727.01(01)+QC01
Generated on 12/21/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19727.01-S19727.06
Project: 30042872 / Racer Lansing GWS
Submitted Date/Time: 12/04/2020 16:00
Sampled by: Donald Richmond
P.O. #: 30042872

QC Report Sections

Cover Page (Page 12)
Analysis Summary (Pages 13-18)
Prep Batch Summary (Page 19)
Surrogates per QC Sample (Page 20)
Internal Standards per Lab Sample (Pages 21-24)
Internal Standards per QC Sample (Page 25)
Batch QC Results (Page 26)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S19727.01
Sample Tag: MW-16-80_120420
Collected Date/Time: 12/04/2020 10:15
Matrix: Groundwater
COC Reference: 094731

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 15:28	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19727.02
Sample Tag: MW-16-80_120420 MS
Collected Date/Time: 12/04/2020 10:15
Matrix: Groundwater
COC Reference: 094731

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 13:48	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19727.03
Sample Tag: MW-16-80_120420 MSD
Collected Date/Time: 12/04/2020 10:15
Matrix: Groundwater
COC Reference: 094731

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 14:13	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19727.04
Sample Tag: PW-14-01_120420
Collected Date/Time: 12/04/2020 11:45
Matrix: Groundwater
COC Reference: 094731

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 22:47	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19727.05
Sample Tag: MW-16-82_120420
Collected Date/Time: 12/04/2020 12:55
Matrix: Groundwater
COC Reference: 094731

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 19:20	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19727.06
Sample Tag: MW-16-85_120420
Collected Date/Time: 12/04/2020 14:30
Matrix: Groundwater
COC Reference: 094731

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/10/20 19:46	201210A9	VS201210W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS201210W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19727.01	1,4-Dioxane	SW8260B - SIM	12/10/20 15:28	201210A9
S19727.02	1,4-Dioxane	SW8260B - SIM	12/10/20 13:48	201210A9
S19727.03	1,4-Dioxane	SW8260B - SIM	12/10/20 14:13	201210A9
S19727.04	1,4-Dioxane	SW8260B - SIM	12/10/20 22:47	201210A9
S19727.05	1,4-Dioxane	SW8260B - SIM	12/10/20 19:20	201210A9
S19727.06	1,4-Dioxane	SW8260B - SIM	12/10/20 19:46	201210A9

Organics - Volatiles, Prep Batch ID: VS201210W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19727.01

Sample Tag: MW-16-80_120420

Collected Date/Time: 12/04/2020 10:15

Matrix: Groundwater

COC Reference: 094731

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 15:28, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**92.7**	50.0	200.0

Lab Sample ID: S19727.04

Sample Tag: PW-14-01_120420

Collected Date/Time: 12/04/2020 11:45

Matrix: Groundwater

COC Reference: 094731

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 22:47, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**87.4**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19727.05

Sample Tag: MW-16-82_120420

Collected Date/Time: 12/04/2020 12:55

Matrix: Groundwater

COC Reference: 094731

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 19:20, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**93.1**	50.0	200.0

Lab Sample ID: S19727.06

Sample Tag: MW-16-85_120420

Collected Date/Time: 12/04/2020 14:30

Matrix: Groundwater

COC Reference: 094731

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201210A9, Run Date: 12/10/2020 19:46, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**91.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201210W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**94.2**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**98.1**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**93.0**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201210W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201210A9.BLKW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 15:02, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 12:59, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		102.3	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201210A9.LCSDW10A, Parent Sample ID: 201210A9.LCSW10A

Run in Batch: 201210A9, Run Date: 12/10/2020 13:24, Prep Date: 12/10/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		109.4	70.0	130.0	6.8	30.0

Merit Laboratories Login Checklist

Lab Set ID: S19727
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872 / Racer Lansing GWS
Submitted: 12/04/2020 16:00 Login User: MMC

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.7
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

094731

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 517 861 0138 FAX NO: P.O. NO:
E-MAIL ADDRESS: Tiffany.linder@arcadis.com QUOTE NO:

INVOICE TO

CONTACT NAME: ☑ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872/Racer Lansing GWS
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond/Donnie Richmond

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☑ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane	Special Instructions
.01/.02/.03	12/4/20	1015	MW-16-80_120420	GW	9		X						X	← MS/MSD
19727.04	12/4/20	1145	PW-14-01_120420	GW	3		X						X	
.05	12/4/20	1255	MW-16-82_120420	GW	3		X						X	
.06	12/4/20	1430	MW-16-85_120420	GW	3		X						X	

RELINQUISHED BY SIGNATURE/ORGANIZATION	☑ Sampler Arcadis	DATE 12/4/2020	TIME 1520
RECEIVED BY SIGNATURE/ORGANIZATION		DATE 12.4.20	TIME 1520
RELINQUISHED BY SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 12/4/2020	TIME 1600
RECEIVED BY SIGNATURE/ORGANIZATION		DATE 12/4/2020	TIME 1600

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE 12.4.20	TIME 1600
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit storage	DATE 12.4.20	TIME 1600

SEAL NO: SEAL INTACT YES ☐ NO ☐ INITIALS:
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS:

NOTES: TEMP. ON ARRIVAL 4.7

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

Analytical Laboratory Report

Revised Report

Report ID: S19782.01(02)+QC01
Generated on 12/21/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19782.01-S19782.03
Project: 30042872.04700 / RACER Lansing
Collected Date(s): 12/07/2020
Submitted Date/Time: 12/08/2020 13:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

Sample .03 tag revised per client request.

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19782.01	MW-16-79_120720	Groundwater	12/07/20 09:50
S19782.02	MW-16-78_120720	Groundwater	12/07/20 11:00
S19782.03	Dup-05_120720	Groundwater	12/07/20 00:01

Lab Sample ID: S19782.01
Sample Tag: MW-16-79_120720
Collected Date/Time: 12/07/2020 09:50
Matrix: Groundwater
COC Reference: 134633

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/16/20 11:50	KAG	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/15/20 15:34, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S19782.02
Sample Tag: MW-16-78_120720
Collected Date/Time: 12/07/2020 11:00
Matrix: Groundwater
COC Reference: 134633

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/16/20 11:50	KAG	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/15/20 16:00, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S19782.03
Sample Tag: Dup-05_120720
Collected Date/Time: 12/07/2020 00:01
Matrix: Groundwater
COC Reference: 134633

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/16/20 11:50	KAG	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/15/20 16:26, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Quality Control Report

Report ID: S19782.01(02)+QC01
Generated on 12/16/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19782.01-S19782.03
Project: 30042872.04700 / RACER Lansing
Submitted Date/Time: 12/08/2020 13:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

QC Report Sections

Cover Page (Page 9)
Analysis Summary (Pages 10-12)
Prep Batch Summary (Page 13)
Surrogates per QC Sample (Page 14)
Internal Standards per Lab Sample (Pages 15-17)
Internal Standards per QC Sample (Page 18)
Batch QC Results (Page 19)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S19782.01
Sample Tag: MW-16-79_120720
Collected Date/Time: 12/07/2020 09:50
Matrix: Groundwater
COC Reference: 134633

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/15/20 15:34	201215A9	VS201215W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19782.02
Sample Tag: MW-16-78_120720
Collected Date/Time: 12/07/2020 11:00
Matrix: Groundwater
COC Reference: 134633

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/15/20 16:00	201215A9	VS201215W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19782.03
Sample Tag: Dup-05
Collected Date/Time: 12/07/2020 00:01
Matrix: Groundwater
COC Reference: 134633

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/15/20 16:26	201215A9	VS201215W1	Yes	BLK/LCS/LCSD/MS/MS

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS201215W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19782.01	1,4-Dioxane	SW8260B - SIM	12/15/20 15:34	201215A9
S19782.02	1,4-Dioxane	SW8260B - SIM	12/15/20 16:00	201215A9
S19782.03	1,4-Dioxane	SW8260B - SIM	12/15/20 16:26	201215A9

Organics - Volatiles, Prep Batch ID: VS201215W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201215A9.BLKW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 14:43, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:14, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201215A9.LCSDW15A, Parent Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:39, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978305M, Parent Sample ID: S19783.04

Run in Batch: 201215A9, Run Date: 12/15/2020 13:04, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978402M, Parent Sample ID: S19784.01

Run in Batch: 201215A9, Run Date: 12/15/2020 13:54, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978306N, Parent Sample ID: 201215A9.1978305M

Run in Batch: 201215A9, Run Date: 12/15/2020 13:29, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978403N, Parent Sample ID: 201215A9.1978402M

Run in Batch: 201215A9, Run Date: 12/15/2020 14:19, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19782.01

Sample Tag: MW-16-79_120720

Collected Date/Time: 12/07/2020 09:50

Matrix: Groundwater

COC Reference: 134633

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201215A9, Run Date: 12/15/2020 15:34, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.3**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19782.02

Sample Tag: MW-16-78_120720

Collected Date/Time: 12/07/2020 11:00

Matrix: Groundwater

COC Reference: 134633

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201215A9, Run Date: 12/15/2020 16:00, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**94.5**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19782.03

Sample Tag: Dup-05

Collected Date/Time: 12/07/2020 00:01

Matrix: Groundwater

COC Reference: 134633

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201215A9, Run Date: 12/15/2020 16:26, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**96.9**	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS201215W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201215A9.BLKW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 14:43, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**96.4**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:14, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**107.2**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201215A9.LCSDW15A, Parent Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:39, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**105.1**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978305M, Parent Sample ID: S19783.04

Run in Batch: 201215A9, Run Date: 12/15/2020 13:04, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**111.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978402M, Parent Sample ID: S19784.01

Run in Batch: 201215A9, Run Date: 12/15/2020 13:54, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**107.5**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978306N, Parent Sample ID: 201215A9.1978305M

Run in Batch: 201215A9, Run Date: 12/15/2020 13:29, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978403N, Parent Sample ID: 201215A9.1978402M

Run in Batch: 201215A9, Run Date: 12/15/2020 14:19, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201215W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201215A9.BLKW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 14:43, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:14, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		90.9	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201215A9.LCSDW15A, Parent Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:39, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		100.7	70.0	130.0	10.2	30.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978305M, Parent Sample ID: S19783.04

Run in Batch: 201215A9, Run Date: 12/15/2020 13:04, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.7	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978402M, Parent Sample ID: S19784.01

Run in Batch: 201215A9, Run Date: 12/15/2020 13:54, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		106.6	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978306N, Parent Sample ID: 201215A9.1978305M

Run in Batch: 201215A9, Run Date: 12/15/2020 13:29, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		97.1	70.0	130.0	8.3	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978403N, Parent Sample ID: 201215A9.1978402M

Run in Batch: 201215A9, Run Date: 12/15/2020 14:19, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		101.4	70.0	130.0	5.0	30.0

Merit Laboratories Login Checklist

Lab Set ID:S19782
Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / RACER Lansing
Submitted: 12/08/2020 13:15 Login User: SRS

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

134633

CHAIN OF CUSTODY RECORD

Plant 2

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 994 2240 FAX NO.:
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com
P.O. NO.:
QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700 / Forest Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jake P. Sarkiewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	8260 BTEX MTBE Sty 1,4 Dioxane
19782.01	12.7.20	0950	MW-116-79_120720	GW	3		3						X
.02	12.7.20	1100	MW-116-78_120720	GW	3		3						X
.03	12.7.20	AM	Dup-05	GW	3		3						X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	DATE 12-8-20	TIME 1315
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit storage	DATE 12-8-20	TIME 1315
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 12/8/20	TIME 1315
RECEIVED BY: SIGNATURE/ORGANIZATION	Sam Smith	DATE 12/8/20	TIME 1315

RELINQUISHED BY: SIGNATURE/ORGANIZATION — DATE — TIME
RECEIVED BY: SIGNATURE/ORGANIZATION — DATE — TIME

SEAL NO. — SEAL INTACT YES ☐ NO ☐ — INITIALS
SEAL NO. — SEAL INTACT YES ☐ NO ☐ — INITIALS

NOTES — TEMP. ON ARRIVAL 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5.18.12

Analytical Laboratory Report

Revised Report

Report ID: S19783.01(02)+QC01
Generated on 12/21/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Addtional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S19783.01-S19783.07
Project: 30042872.04700 / RACER Lansing
Collected Date(s): 12/07/2020 - 12/08/2020
Submitted Date/Time: 12/08/2020 13:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

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Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

Sample .03 tag revised per client request.

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
N/A	Not Applicable
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S19783.01	MW-13-46_120720	Groundwater	12/07/20 13:00
S19783.02	MW-13-48_120720	Groundwater	12/07/20 14:20
S19783.03	Dup-07_120720	Groundwater	12/07/20 12:00
S19783.04	MW-13-25_120820	Groundwater	12/08/20 09:50
S19783.05	MW-13-25_120820 MS	Groundwater	12/08/20 09:50
S19783.06	MW-13-25_120820 MSD	Groundwater	12/08/20 09:50
S19783.07	MW-12-21_120820	Groundwater	12/08/20 11:40

Lab Sample ID: S19783.01
Sample Tag: MW-13-46_120720
Collected Date/Time: 12/07/2020 13:00
Matrix: Groundwater
COC Reference: 134634

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/16/20 11:50	KAG	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/15/20 16:52, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Lab Sample ID: S19783.02
Sample Tag: MW-13-48_120720
Collected Date/Time: 12/07/2020 14:20
Matrix: Groundwater
COC Reference: 134634

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/16/20 11:50	KAG	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/16/20 20:18, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	137	1		ug/L	1	123-91-1	

Lab Sample ID: S19783.03
Sample Tag: Dup-07_120720
Collected Date/Time: 12/07/2020 12:00
Matrix: Groundwater
COC Reference: 134634

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/16/20 11:50	KAG	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/16/20 20:43, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	137	1		ug/L	1	123-91-1	

Lab Sample ID: S19783.04
Sample Tag: MW-13-25_120820
Collected Date/Time: 12/08/2020 09:50
Matrix: Groundwater
COC Reference: 134634

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/16/20 11:50	KAG	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/15/20 17:18, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	17	1		ug/L	1	123-91-1	

Lab Sample ID: S19783.05
Sample Tag: MW-13-25_120820 MS
Collected Date/Time: 12/08/2020 09:50
Matrix: Groundwater
COC Reference: 134634

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/16/20 11:50	KAG	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/15/20 13:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	60	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S19783.06
Sample Tag: MW-13-25_120820 MSD
Collected Date/Time: 12/08/2020 09:50
Matrix: Groundwater
COC Reference: 134634

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/16/20 11:50	KAG	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/15/20 13:29, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	65	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L

Lab Sample ID: S19783.07
Sample Tag: MW-12-21_120820
Collected Date/Time: 12/08/2020 11:40
Matrix: Groundwater
COC Reference: 134634

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.2	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/16/20 11:50	KAG	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/16/20 19:52, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	310	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration

Quality Control Report

Report ID: S19783.01(02)+QC01
Generated on 12/17/2020

Report to

Attention: Tiffany Linder
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S19783.01-S19783.07
Project: 30042872.04700 / RACER Lansing
Submitted Date/Time: 12/08/2020 13:15
Sampled by: Jake Pisarkiewicz
P.O. #: 30042872

QC Report Sections

Cover Page (Page 13)
Analysis Summary (Pages 14-20)
Prep Batch Summary (Page 21)
Surrogates per Lab Sample (Pages 22-24)
Surrogates per QC Sample (Pages 25-26)
Internal Standards per Lab Sample (Pages 27-31)
Internal Standards per QC Sample (Pages 32-33)
Batch QC Results (Pages 34-35)

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S19783.01
Sample Tag: MW-13-46_120720
Collected Date/Time: 12/07/2020 13:00
Matrix: Groundwater
COC Reference: 134634

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/15/20 16:52	201215A9	VS201215W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19783.02
Sample Tag: MW-13-48_120720
Collected Date/Time: 12/07/2020 14:20
Matrix: Groundwater
COC Reference: 134634

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/16/20 20:18	201216A9	VS201216W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19783.03
Sample Tag: Dup-07
Collected Date/Time: 12/07/2020 12:00
Matrix: Groundwater
COC Reference: 134634

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/16/20 20:43	201216A9	VS201216W1	Yes	BLK/LCS/LCSD

Lab Sample ID: S19783.04
Sample Tag: MW-13-25_120820
Collected Date/Time: 12/08/2020 09:50
Matrix: Groundwater
COC Reference: 134634

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/15/20 17:18	201215A9	VS201215W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19783.05
Sample Tag: MW-13-25_120820 MS
Collected Date/Time: 12/08/2020 09:50
Matrix: Groundwater
COC Reference: 134634

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/15/20 13:04	201215A9	VS201215W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19783.06

Sample Tag: MW-13-25_120820 MSD

Collected Date/Time: 12/08/2020 09:50

Matrix: Groundwater

COC Reference: 134634

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/15/20 13:29	201215A9	VS201215W1	Yes	BLK/LCS/LCSD/MS/MS

Lab Sample ID: S19783.07
Sample Tag: MW-12-21_120820
Collected Date/Time: 12/08/2020 11:40
Matrix: Groundwater
COC Reference: 134634

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	12/16/20 19:52	201216A9	VS201216W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VS201215W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19783.01	1,4-Dioxane	SW8260B - SIM	12/15/20 16:52	201215A9
S19783.04	1,4-Dioxane	SW8260B - SIM	12/15/20 17:18	201215A9
S19783.05	1,4-Dioxane	SW8260B - SIM	12/15/20 13:04	201215A9
S19783.06	1,4-Dioxane	SW8260B - SIM	12/15/20 13:29	201215A9

Organics - Volatiles, Prep Batch ID: VS201216W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S19783.02	1,4-Dioxane	SW8260B - SIM	12/16/20 20:18	201216A9
S19783.03	1,4-Dioxane	SW8260B - SIM	12/16/20 20:43	201216A9
S19783.07	1,4-Dioxane	SW8260B - SIM	12/16/20 19:52	201216A9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S19783.02

Sample Tag: MW-13-48_120720

Collected Date/Time: 12/07/2020 14:20

Matrix: Groundwater

COC Reference: 134634

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201216A9, Run Date: 12/16/2020 20:18, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D	*	**42.5**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S19783.03

Sample Tag: Dup-07

Collected Date/Time: 12/07/2020 12:00

Matrix: Groundwater

COC Reference: 134634

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201216A9, Run Date: 12/16/2020 20:43, Matrix: WW, Dilution: 1

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D	*	**42.5**	60.0	140.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S19783.07

Sample Tag: MW-12-21_120820

Collected Date/Time: 12/08/2020 11:40

Matrix: Groundwater

COC Reference: 134634

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201216A9, Run Date: 12/16/2020 19:52, Matrix: WW, Dilution: 10

Surrogate	Flags	**%Rec**	LCL	UCL
BROMOFORM-D	*	**47.5**	60.0	140.0

Organics - Volatiles, Prep Batch ID: VS201215W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201215A9.BLKW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 14:43, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:14, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201215A9.LCSDW15A, Parent Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:39, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978305M, Parent Sample ID: S19783.04

Run in Batch: 201215A9, Run Date: 12/15/2020 13:04, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978402M, Parent Sample ID: S19784.01

Run in Batch: 201215A9, Run Date: 12/15/2020 13:54, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978306N, Parent Sample ID: 201215A9.1978305M

Run in Batch: 201215A9, Run Date: 12/15/2020 13:29, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978403N, Parent Sample ID: 201215A9.1978402M

Run in Batch: 201215A9, Run Date: 12/15/2020 14:19, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL

No Surrogates

Organics - Volatiles, Prep Batch ID: VS201216W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201216A9.BLKW16A

Run in Batch: 201216A9, Run Date: 12/16/2020 19:01, Prep Date: 12/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D	*	**47.5**	60.0	140.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201216A9.LCSW16A

Run in Batch: 201216A9, Run Date: 12/16/2020 17:47, Prep Date: 12/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D	*	**47.5**	60.0	140.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201216A9.LCSDW16A, Parent Sample ID: 201216A9.LCSW16A

Run in Batch: 201216A9, Run Date: 12/16/2020 18:12, Prep Date: 12/16/2020, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D	*	**47.5**	60.0	140.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19783.01

Sample Tag: MW-13-46_120720

Collected Date/Time: 12/07/2020 13:00

Matrix: Groundwater

COC Reference: 134634

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201215A9, Run Date: 12/15/2020 16:52, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**100.2**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19783.02

Sample Tag: MW-13-48_120720

Collected Date/Time: 12/07/2020 14:20

Matrix: Groundwater

COC Reference: 134634

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201216A9, Run Date: 12/16/2020 20:18, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**99.4**	50.0	200.0
1,4-Dioxane-D8		**123.7**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**109.0**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19783.03

Sample Tag: Dup-07

Collected Date/Time: 12/07/2020 12:00

Matrix: Groundwater

COC Reference: 134634

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201216A9, Run Date: 12/16/2020 20:43, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**97.1**	50.0	200.0
1,4-Dioxane-D8		**126.7**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**108.8**	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S19783.04

Sample Tag: MW-13-25_120820

Collected Date/Time: 12/08/2020 09:50

Matrix: Groundwater

COC Reference: 134634

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201215A9, Run Date: 12/15/2020 17:18, Matrix: WW, Dilution: 1

Internal Standard	Flags	**%Rec**	LCL	UCL
1,4-Dioxane-D8		**106.7**	50.0	200.0

Lab Sample ID: S19783.07

Sample Tag: MW-12-21_120820

Collected Date/Time: 12/08/2020 11:40

Matrix: Groundwater

COC Reference: 134634

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 201216A9, Run Date: 12/16/2020 19:52, Matrix: WW, Dilution: 10

Internal Standard	Flags	**%Rec**	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**93.5**	50.0	200.0
1,4-Dioxane-D8		**82.7**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**85.1**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201215W1

QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201215A9.BLKW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 14:43, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**96.4**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:14, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**107.2**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201215A9.LCSDW15A, Parent Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:39, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**105.1**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978305M, Parent Sample ID: S19783.04

Run in Batch: 201215A9, Run Date: 12/15/2020 13:04, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**111.0**	50.0	200.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978402M, Parent Sample ID: S19784.01

Run in Batch: 201215A9, Run Date: 12/15/2020 13:54, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**107.5**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978306N, Parent Sample ID: 201215A9.1978305M

Run in Batch: 201215A9, Run Date: 12/15/2020 13:29, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.9**	50.0	200.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978403N, Parent Sample ID: 201215A9.1978402M

Run in Batch: 201215A9, Run Date: 12/15/2020 14:19, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		**104.7**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201216W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201216A9.BLKW16A

Run in Batch: 201216A9, Run Date: 12/16/2020 19:01, Prep Date: 12/16/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**95.7**	50.0	200.0
1,4-Dioxane-D8		**83.2**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**87.7**	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 201216A9.LCSW16A

Run in Batch: 201216A9, Run Date: 12/16/2020 17:47, Prep Date: 12/16/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**97.7**	50.0	200.0
1,4-Dioxane-D8		**99.1**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**93.8**	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201216A9.LCSDW16A, Parent Sample ID: 201216A9.LCSW16A

Run in Batch: 201216A9, Run Date: 12/16/2020 18:12, Prep Date: 12/16/2020, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		**98.6**	50.0	200.0
1,4-Dioxane-D8		**97.5**	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		**92.4**	50.0	200.0

Organics - Volatiles, Prep Batch ID: VS201215W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD/MS/MSD

Blank (BLK)

Lab Sample ID: 201215A9.BLKW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 14:43, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:14, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		90.9	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201215A9.LCSDW15A, Parent Sample ID: 201215A9.LCSW15A

Run in Batch: 201215A9, Run Date: 12/15/2020 12:39, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		100.7	70.0	130.0	10.2	30.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978305M, Parent Sample ID: S19783.04

Run in Batch: 201215A9, Run Date: 12/15/2020 13:04, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		86.7	70.0	130.0

Matrix Spike (MS)

Lab Sample ID: 201215A9.1978402M, Parent Sample ID: S19784.01

Run in Batch: 201215A9, Run Date: 12/15/2020 13:54, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		106.6	70.0	130.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978306N, Parent Sample ID: 201215A9.1978305M

Run in Batch: 201215A9, Run Date: 12/15/2020 13:29, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		97.1	70.0	130.0	8.3	30.0

Matrix Spike Duplicate (MSD)

Lab Sample ID: 201215A9.1978403N, Parent Sample ID: 201215A9.1978402M

Run in Batch: 201215A9, Run Date: 12/15/2020 14:19, Prep Date: 12/15/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		101.4	70.0	130.0	5.0	30.0

Organics - Volatiles, Prep Batch ID: VS201216W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 201216A9.BLKW16A

Run in Batch: 201216A9, Run Date: 12/16/2020 19:01, Prep Date: 12/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 201216A9.LCSW16A

Run in Batch: 201216A9, Run Date: 12/16/2020 17:47, Prep Date: 12/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		105.0	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 201216A9.LCSDW16A, Parent Sample ID: 201216A9.LCSW16A

Run in Batch: 201216A9, Run Date: 12/16/2020 18:12, Prep Date: 12/16/2020, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		101.2	70.0	130.0	3.6	30.0

Merit Laboratories Login Checklist

Lab Set ID:S19783
Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30042872.04700 / RACER Lansing
Submitted: 12/08/2020 13:15 Login User: SRS

Attention: Tiffany Linder
Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: 248-994-2272 FAX:
Email: tiffany.linder@arcadis-us.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[X] No	[ ] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

134634

CHAIN OF CUSTODY RECORD Plant 3

REPORT TO

CONTACT NAME: Tiffany Linder
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr Suite 500
CITY: Novi STATE: MI ZIP CODE: 48377
PHONE NO.: 248 994 2240 FAX NO: P.O. NO:
E-MAIL ADDRESS: Tiffany.Linder@arcadis.com QUOTE NO:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO: E MAIL ADDRESS:

PROJECT NO./NAME: 30042872.04700 / Racer Lansing
SAMPLER(S) - PLEASE PRINT/SIGN NAME: John Pisarkiewicz

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	1,4 Dioxane 8260B SIM	Special Instructions
19783.01	12-7-20	1300	MW-13-46_120720	GW	3		3						X	
.02	12-7-20	1420	MW-13-48_120720	GW	3		3						X	
.03	12-7-20	PM	Dup-07	GW	3		3						X	
04/05/16	12-8-20	0950	MW-13-25_120820	GW	9		9						X	MS/MSD
.07	12-8-20	1140	MW-12-21_120820	GW	3		3						X	

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☐ Sampler	DATE 12-8-20	TIME 1315
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit storage	DATE 12-8-20	TIME 1315
RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Dropbox	DATE 12/8/20	TIME 1315
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 12/8/20	TIME 1315

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES TEMP. ON ARRIVAL 2.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev 5 18 12

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA81363

Sampling Dates: 12/01/20 - 12/02/20

Report to:

Arcadis
300 S Washington Sq Suite 315
Lansing, MI 48933
marina.samp@arcadis.com; alex.villhauer@arcadis.com;
kaitlyn.voet@arcadis.com; tiffany.linder@arcadis.com
ATTN: Alex Villhauer

Total number of pages in report: 77

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA81363

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
This report contains results reported as ND = Not detected. The following applies: Organics ND = Not detected above the MDL							
FA81363-1	12/01/20	10:45	AW	12/03/20	AQ	Ground Water	MW-19-111_120120
FA81363-2	12/01/20	11:40	AW	12/03/20	AQ	Ground Water	MW-19-108_120120
FA81363-3	12/01/20	12:25	AW	12/03/20	AQ	Ground Water	MW-18-92_120120
FA81363-4	12/01/20	13:50	AW	12/03/20	AQ	Ground Water	MW-19-107_120120
FA81363-5	12/01/20	14:50	AW	12/03/20	AQ	Ground Water	MW-18-98_120120
FA81363-6	12/01/20	16:10	AW	12/03/20	AQ	Ground Water	MW-18-100_120120
FA81363-7	12/02/20	09:50	AW	12/03/20	AQ	Ground Water	MW-19-114_120220
FA81363-8	12/02/20	10:45	AW	12/03/20	AQ	Ground Water	MW-18-106_120220
FA81363-9	12/02/20	11:35	AW	12/03/20	AQ	Ground Water	MW-18-104_120220
FA81363-10	12/02/20	13:05	AW	12/03/20	AQ	Ground Water	MW-18-102_120220
FA81363-11	12/02/20	14:25	AW	12/03/20	AQ	Ground Water	MW-19-112_120220
FA81363-12	12/02/20	15:25	AW	12/03/20	AQ	Ground Water	MW-18-99_120220

Summary of Hits

Job Number: FA81363
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/01/20 thru 12/02/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA81363-1	**MW-19-111_120120**					
Perfluorobutanoic acid		0.0030 J	0.0035	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0012 J	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0018	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0016 J	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0056	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0013 J	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0017 J	0.0018	0.00088	ug/l	EPA 537M BY ID
FA81363-2	**MW-19-108_120120**					
Perfluorooctanoic acid		0.0030	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0017 J	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.00091 J	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0036	0.0018	0.00088	ug/l	EPA 537M BY ID
FA81363-3	**MW-18-92_120120**					
Perfluorooctanoic acid		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81363-4	**MW-19-107_120120**					
Perfluorobutanoic acid		0.0029 J	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0036	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.00093 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0030	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0021	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0054	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid [a]		0.0032	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81363-5	**MW-18-98_120120**					
Perfluorobutanoic acid		0.0179	0.0035	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0114	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0143	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0104	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0314	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0019	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0019	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0014 J	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0017 J	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0809	0.0018	0.00088	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81363
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/01/20 thru 12/02/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA81363-6	**MW-18-100_120120**					
Perfluorobutanoic acid		0.0071	0.0035	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0021	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0022	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0011 J	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0023	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0015 J	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0040	0.0018	0.00088	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0014 J	0.0018	0.00088	ug/l	EPA 537M BY ID
FA81363-7	**MW-19-114_120220**					
Perfluorobutanoic acid		0.0022 J	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0012 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0026	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81363-8	**MW-18-106_120220**					
Perfluorobutanesulfonic acid		0.0012 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0021	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0039	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81363-9	**MW-18-104_120220**					
Perfluorooctanesulfonic acid		0.0055	0.0018	0.00088	ug/l	EPA 537M BY ID
FA81363-10	**MW-18-102_120220**					
No hits reported in this sample.						
FA81363-11	**MW-19-112_120220**					
Perfluorobutanoic acid [a]		0.0025 J	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid [a]		0.0040	0.0020	0.0010	ug/l	EPA 537M BY ID
FA81363-12	**MW-18-99_120220**					
Perfluorobutanoic acid		0.0160	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0047	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0048	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0037	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0098	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0022	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81363
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/01/20 thru 12/02/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorohexanesulfonic acid		0.0032	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0030	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.130	0.0018	0.00089	ug/l	EPA 537M BY ID

(a) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-19-111_120120		
Lab Sample ID:	FA81363-1	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q8843.D	1	12/09/20 02:33	NAF	12/05/20 09:00	OP83269	S4Q122
Run #2							

	Initial Volume	Final Volume
Run #1	285 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0030	0.0035	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0012	0.0018	0.00088	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0018	0.0018	0.00088	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0016	0.0018	0.00088	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0056	0.0018	0.00088	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00088	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00088	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00088	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00088	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00088	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00088	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0013	0.0018	0.00088	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00088	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0017	0.0018	0.00088	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00088	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00088	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00088	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00088	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0035	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0035	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0035	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-111_120120		
Lab Sample ID:	FA81363-1	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0035	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0070	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0070	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0070	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	68%		35-135%
	13C5-PFPeA	72%		50-150%
	13C5-PFHxA	81%		50-150%
	13C4-PFHpA	89%		50-150%
	13C8-PFOA	96%		50-150%
	13C9-PFNA	101%		50-150%
	13C6-PFDA	99%		50-150%
	13C7-PFUnDA	92%		40-140%
	13C2-PFDoDA	87%		40-140%
	13C2-PFTeDA	89%		30-130%
	13C3-PFBS	73%		50-150%
	13C3-PFHxS	91%		50-150%
	13C8-PFOS	94%		50-150%
	13C8-FOSA	82%		30-130%
	d3-MeFOSAA	111%		50-150%
	d5-EtFOSAA	100%		50-150%
	13C2-4:2FTS	81%		50-150%
	13C2-6:2FTS	103%		50-150%
	13C2-8:2FTS	96%		50-150%
	13C3-HFPO-DA	83%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-108_120120		
Lab Sample ID:	FA81363-2	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q8844.D	1	12/09/20 02:49	NAF	12/05/20 09:00	OP83269	S4Q122
Run #2							

	Initial Volume	Final Volume
Run #1	285 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0035	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00088	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00088	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00088	ug/l	
335-67-1	Perfluorooctanoic acid	0.0030	0.0018	0.00088	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00088	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00088	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00088	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00088	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00088	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00088	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0017	0.0018	0.00088	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00088	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.00091	0.0018	0.00088	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00088	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0036	0.0018	0.00088	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00088	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00088	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0035	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0035	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0035	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-108_120120		
Lab Sample ID:	FA81363-2	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0035	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0070	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0070	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0070	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%		35-135%
	13C5-PFPeA	74%		50-150%
	13C5-PFHxA	83%		50-150%
	13C4-PFHpA	88%		50-150%
	13C8-PFOA	95%		50-150%
	13C9-PFNA	98%		50-150%
	13C6-PFDA	98%		50-150%
	13C7-PFUnDA	89%		40-140%
	13C2-PFDoDA	79%		40-140%
	13C2-PFTeDA	52%		30-130%
	13C3-PFBS	73%		50-150%
	13C3-PFHxS	91%		50-150%
	13C8-PFOS	94%		50-150%
	13C8-FOSA	75%		30-130%
	d3-MeFOSAA	112%		50-150%
	d5-EtFOSAA	101%		50-150%
	13C2-4:2FTS	83%		50-150%
	13C2-6:2FTS	103%		50-150%
	13C2-8:2FTS	97%		50-150%
	13C3-HFPO-DA	84%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-92_120120		
Lab Sample ID:	FA81363-3	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q8845.D	1	12/09/20 03:04	NAF	12/05/20 09:00	OP83269	S4Q122
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0011	0.0018	0.00089	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-92_120120		
Lab Sample ID:	FA81363-3	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%		35-135%
	13C5-PFPeA	67%		50-150%
	13C5-PFHxA	75%		50-150%
	13C4-PFHpA	82%		50-150%
	13C8-PFOA	89%		50-150%
	13C9-PFNA	90%		50-150%
	13C6-PFDA	89%		50-150%
	13C7-PFUnDA	81%		40-140%
	13C2-PFDoDA	75%		40-140%
	13C2-PFTeDA	68%		30-130%
	13C3-PFBS	68%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	85%		50-150%
	13C8-FOSA	83%		30-130%
	d3-MeFOSAA	98%		50-150%
	d5-EtFOSAA	90%		50-150%
	13C2-4:2FTS	74%		50-150%
	13C2-6:2FTS	95%		50-150%
	13C2-8:2FTS	86%		50-150%
	13C3-HFPO-DA	76%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-107_120120		
Lab Sample ID:	FA81363-4	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59624.D	1	12/13/20 19:10	NAF	12/10/20 08:30	OP83335	S2Q875
Run #2 [a]	4Q8846.D	1	12/09/20 03:20	NAF	12/05/20 09:00	OP83269	S4Q122

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	285 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0029	0.0036	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0036	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.00093	0.0018	0.00089	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0030	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid [b]	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid [b]	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid [b]	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid [b]	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid [b]	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0021	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0054	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid [b]	0.0032	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid [b]	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid [b]	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA [b]	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA [b]	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-107_120120		
Lab Sample ID:	FA81363-4	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major) [b]	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Mino [b]	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	64%	64%	35-135%
	13C5-PFPeA	67%	71%	50-150%
	13C5-PFHxA	65%	79%	50-150%
	13C4-PFHpA	61%	86%	50-150%
	13C8-PFOA	64%	92%	50-150%
	13C9-PFNA	62%	83%	50-150%
	13C6-PFDA	47% [c]	43% [c]	50-150%
	13C7-PFUnDA	18% [c]	10% [c]	40-140%
	13C2-PFDoDA	3% [c]	2% [c]	40-140%
	13C2-PFTeDA	1% [c]	2% [c]	30-130%
	13C3-PFBS	69%	73%	50-150%
	13C3-PFHxS	62%	87%	50-150%
	13C8-PFOS	48% [c]	46% [c]	50-150%
	13C8-FOSA	45%	44%	30-130%
	d3-MeFOSAA	38% [c]	27% [c]	50-150%
	d5-EtFOSAA	26% [c]	15% [c]	50-150%
	13C2-4:2FTS	64%	79%	50-150%
	13C2-6:2FTS	67%	100%	50-150%
	13C2-8:2FTS	52%	52%	50-150%
	13C3-HFPO-DA	73%	79%	50-150%

(a) Confirmation run for ID Standard Recoveries.
(b) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-98_120120		
Lab Sample ID:	FA81363-5	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q8847.D	1	12/09/20 03:35	NAF	12/05/20 09:00	OP83269	S4Q122
Run #2							

	Initial Volume	Final Volume
Run #1	285 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0179	0.0035	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0114	0.0018	0.00088	ug/l	
307-24-4	Perfluorohexanoic acid	0.0143	0.0018	0.00088	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0104	0.0018	0.00088	ug/l	
335-67-1	Perfluorooctanoic acid	0.0314	0.0018	0.00088	ug/l	
375-95-1	Perfluorononanoic acid	0.0019	0.0018	0.00088	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00088	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00088	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00088	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00088	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00088	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0019	0.0018	0.00088	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00088	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0014	0.0018	0.00088	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.0017	0.0018	0.00088	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0809	0.0018	0.00088	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00088	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00088	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0035	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0035	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0035	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-98_120120		
Lab Sample ID:	FA81363-5	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0035	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0070	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0070	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0070	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	77%		35-135%
	13C5-PFPeA	82%		50-150%
	13C5-PFHxA	90%		50-150%
	13C4-PFHpA	95%		50-150%
	13C8-PFOA	102%		50-150%
	13C9-PFNA	103%		50-150%
	13C6-PFDA	102%		50-150%
	13C7-PFUnDA	93%		40-140%
	13C2-PFDoDA	82%		40-140%
	13C2-PFTeDA	57%		30-130%
	13C3-PFBS	82%		50-150%
	13C3-PFHxS	97%		50-150%
	13C8-PFOS	97%		50-150%
	13C8-FOSA	55%		30-130%
	d3-MeFOSAA	122%		50-150%
	d5-EtFOSAA	110%		50-150%
	13C2-4:2FTS	90%		50-150%
	13C2-6:2FTS	109%		50-150%
	13C2-8:2FTS	105%		50-150%
	13C3-HFPO-DA	90%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-100_120120		
Lab Sample ID:	FA81363-6	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q8848.D	1	12/09/20 03:51	NAF	12/05/20 09:00	OP83269	S4Q122
Run #2							

	Initial Volume	Final Volume
Run #1	285 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0071	0.0035	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0021	0.0018	0.00088	ug/l	
307-24-4	Perfluorohexanoic acid	0.0022	0.0018	0.00088	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0011	0.0018	0.00088	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0023	0.0018	0.00088	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00088	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00088	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00088	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00088	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00088	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00088	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0015	0.0018	0.00088	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00088	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0040	0.0018	0.00088	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00088	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0014	0.0018	0.00088	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00088	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00088	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0035	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0035	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0035	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-100_120120		
Lab Sample ID:	FA81363-6	**Date Sampled:**	12/01/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0035	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0070	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0070	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0070	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	95%		35-135%
	13C5-PFPeA	96%		50-150%
	13C5-PFHxA	99%		50-150%
	13C4-PFHpA	101%		50-150%
	13C8-PFOA	104%		50-150%
	13C9-PFNA	103%		50-150%
	13C6-PFDA	102%		50-150%
	13C7-PFUnDA	95%		40-140%
	13C2-PFDoDA	89%		40-140%
	13C2-PFTeDA	72%		30-130%
	13C3-PFBS	93%		50-150%
	13C3-PFHxS	99%		50-150%
	13C8-PFOS	97%		50-150%
	13C8-FOSA	98%		30-130%
	d3-MeFOSAA	114%		50-150%
	d5-EtFOSAA	105%		50-150%
	13C2-4:2FTS	98%		50-150%
	13C2-6:2FTS	105%		50-150%
	13C2-8:2FTS	98%		50-150%
	13C3-HFPO-DA	101%		50-150%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-114_120220		
Lab Sample ID:	FA81363-7	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q8849.D	1	12/09/20 04:06	NAF	12/05/20 09:00	OP83269	S4Q122
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0022	0.0036	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0012	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0026	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-114_120220		
Lab Sample ID:	FA81363-7	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	85%		35-135%
	13C5-PFPeA	83%		50-150%
	13C5-PFHxA	88%		50-150%
	13C4-PFHpA	91%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	93%		50-150%
	13C6-PFDA	91%		50-150%
	13C7-PFUnDA	84%		40-140%
	13C2-PFDoDA	79%		40-140%
	13C2-PFTeDA	76%		30-130%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	90%		50-150%
	13C8-PFOS	89%		50-150%
	13C8-FOSA	93%		30-130%
	d3-MeFOSAA	100%		50-150%
	d5-EtFOSAA	93%		50-150%
	13C2-4:2FTS	87%		50-150%
	13C2-6:2FTS	95%		50-150%
	13C2-8:2FTS	89%		50-150%
	13C3-HFPO-DA	91%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-106_120220		
Lab Sample ID:	FA81363-8	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q8850.D	1	12/09/20 04:21	NAF	12/05/20 09:00	OP83269	S4Q122
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0012	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0021	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0039	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-106_120220		
Lab Sample ID:	FA81363-8	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	90%		35-135%
	13C5-PFPeA	96%		50-150%
	13C5-PFHxA	102%		50-150%
	13C4-PFHpA	107%		50-150%
	13C8-PFOA	111%		50-150%
	13C9-PFNA	111%		50-150%
	13C6-PFDA	112%		50-150%
	13C7-PFUnDA	98%		40-140%
	13C2-PFDoDA	82%		40-140%
	13C2-PFTeDA	34%		30-130%
	13C3-PFBS	96%		50-150%
	13C3-PFHxS	107%		50-150%
	13C8-PFOS	105%		50-150%
	13C8-FOSA	90%		30-130%
	d3-MeFOSAA	122%		50-150%
	d5-EtFOSAA	112%		50-150%
	13C2-4:2FTS	103%		50-150%
	13C2-6:2FTS	114%		50-150%
	13C2-8:2FTS	109%		50-150%
	13C3-HFPO-DA	104%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-104_120220		
Lab Sample ID:	FA81363-9	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q8853.D	1	12/09/20 05:08	NAF	12/05/20 09:00	OP83269	S4Q122
Run #2							

	Initial Volume	Final Volume
Run #1	285 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0035	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00088	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00088	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00088	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00088	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00088	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00088	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00088	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00088	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00088	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00088	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00088	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00088	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00088	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00088	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0055	0.0018	0.00088	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00088	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00088	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0035	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0035	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0035	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-18-104_120220
Lab Sample ID: FA81363-9
Matrix: AQ - Ground Water
Method: EPA 537M BY ID EPA 537 MOD
Project: Racer Lansing PFAS Delineation; Lansing, MI

Date Sampled: 12/02/20
Date Received: 12/03/20
Percent Solids: n/a

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0070	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0035	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0070	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0070	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0070	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	85%		35-135%
	13C5-PFPeA	85%		50-150%
	13C5-PFHxA	93%		50-150%
	13C4-PFHpA	97%		50-150%
	13C8-PFOA	102%		50-150%
	13C9-PFNA	102%		50-150%
	13C6-PFDA	101%		50-150%
	13C7-PFUnDA	96%		40-140%
	13C2-PFDoDA	90%		40-140%
	13C2-PFTeDA	84%		30-130%
	13C3-PFBS	87%		50-150%
	13C3-PFHxS	95%		50-150%
	13C8-PFOS	99%		50-150%
	13C8-FOSA	98%		30-130%
	d3-MeFOSAA	115%		50-150%
	d5-EtFOSAA	107%		50-150%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	103%		50-150%
	13C2-8:2FTS	99%		50-150%
	13C3-HFPO-DA	93%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-18-102_120220
Lab Sample ID: FA81363-10
Matrix: AQ - Ground Water
Method: EPA 537M BY ID EPA 537 MOD
Project: Racer Lansing PFAS Delineation; Lansing, MI

Date Sampled: 12/02/20
Date Received: 12/03/20
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59363.D	1	12/08/20 20:01	NAF	12/05/20 08:30	OP83270	S2Q871
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-102_120220		
Lab Sample ID:	FA81363-10	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	82%		35-135%
	13C5-PFPeA	82%		50-150%
	13C5-PFHxA	82%		50-150%
	13C4-PFHpA	82%		50-150%
	13C8-PFOA	87%		50-150%
	13C9-PFNA	88%		50-150%
	13C6-PFDA	89%		50-150%
	13C7-PFUnDA	82%		40-140%
	13C2-PFDoDA	80%		40-140%
	13C2-PFTeDA	79%		30-130%
	13C3-PFBS	84%		50-150%
	13C3-PFHxS	87%		50-150%
	13C8-PFOS	93%		50-150%
	13C8-FOSA	84%		30-130%
	d3-MeFOSAA	97%		50-150%
	d5-EtFOSAA	90%		50-150%
	13C2-4:2FTS	84%		50-150%
	13C2-6:2FTS	89%		50-150%
	13C2-8:2FTS	87%		50-150%
	13C3-HFPO-DA	90%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-112_120220		
Lab Sample ID:	FA81363-11	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9128.D	1	12/14/20 15:21	MV	12/11/20 13:00	OP83342	S4Q125
Run #2 [a]	2Q59364.D	1	12/08/20 20:16	NAF	12/05/20 08:30	OP83270	S2Q871

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	260 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid [b]	0.0025	0.0040	0.0020	ug/l	J
2706-90-3	Perfluoropentanoic acid [b]	0.0040	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid [b]	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid [b]	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid [b]	ND	0.0020	0.0010	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid [c]	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic aci [b]	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA [b]	ND	0.0040	0.0020	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA [b]	ND	0.0040	0.0020	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-19-112_120220		
Lab Sample ID:	FA81363-11	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Mino [b]	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	27% [d]	33% [e]	35-135%
	13C5-PFPeA	41% [d]	43% [e]	50-150%
	13C5-PFHxA	52%	47% [e]	50-150%
	13C4-PFHpA	64%	50%	50-150%
	13C8-PFOA	72%	59%	50-150%
	13C9-PFNA	80%	66%	50-150%
	13C6-PFDA	73%	57%	50-150%
	13C7-PFUnDA	52%	27% [e]	40-140%
	13C2-PFDoDA	25% [d]	8% [e]	40-140%
	13C2-PFTeDA	4% [d]	1% [e]	30-130%
	13C3-PFBS	49% [e]	52%	50-150%
	13C3-PFHxS	72%	58%	50-150%
	13C8-PFOS	74%	60%	50-150%
	13C8-FOSA	23% [d]	3% [e]	30-130%
	d3-MeFOSAA	52%	43% [e]	50-150%
	d5-EtFOSAA	43% [d]	31% [e]	50-150%
	13C2-4:2FTS	51%	46% [e]	50-150%
	13C2-6:2FTS	79%	65%	50-150%
	13C2-8:2FTS	80%	62%	50-150%
	13C3-HFPO-DA	51%	55%	50-150%

(a) Confirmation run.
(b) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
(c) Associated ID Standard outside control limits due to matrix interference.
(d) Outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
(e) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-99_120220		
Lab Sample ID:	FA81363-12	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59365.D	1	12/08/20 20:30	NAF	12/05/20 08:30	OP83270	S2Q871
Run #2	3Q31057.D	5	12/09/20 15:29	MRE	12/05/20 08:30	OP83270	S3Q458

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0160	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0047	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0048	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0037	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0098	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0022	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0011	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid [a]	ND [b]	0.0089	0.0045	ug/l	
376-06-7	Perfluorotetradecanoic acid [a]	ND [b]	0.0089	0.0045	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0032	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0030	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.130	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.018	0.0089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-99_120220		
Lab Sample ID:	FA81363-12	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	65%	81%	35-135%
	13C5-PFPeA	64%	81%	50-150%
	13C5-PFHxA	61%	79%	50-150%
	13C4-PFHpA	57%	80%	50-150%
	13C8-PFOA	61%	81%	50-150%
	13C9-PFNA	65%	82%	50-150%
	13C6-PFDA	71%	83%	50-150%
	13C7-PFUnDA	64%	75%	40-140%
	13C2-PFDoDA	42%	61%	40-140%
	13C2-PFTeDA	8% [d]	23% [c]	30-130%
	13C3-PFBS	70%	85%	50-150%
	13C3-PFHxS	63%	83%	50-150%
	13C8-PFOS	69%	84%	50-150%
	13C8-FOSA	14% [d]	31%	30-130%
	d3-MeFOSAA	85%	85%	50-150%
	d5-EtFOSAA	83%	82%	50-150%
	13C2-4:2FTS	64%	74%	50-150%
	13C2-6:2FTS	68%	79%	50-150%
	13C2-8:2FTS	79%	79%	50-150%
	13C3-HFPO-DA	66%	70%	50-150%

(a) Associated ID Standard outside control limits, Confirmed by re-analysis.
(b) Result is from Run# 2
(c) Outside control limits. Confirmed by reanalysis.
(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

SGS North America Inc - Orlando FA81363

SGS Plant 3

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # : PAGE 1 OF 1

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Tiffany.Linder@arcadis.com Email:
Phone #: 810-225-1928
Sampler(s) Name(s) (Printed) Sampler 1: Austin Westhuis Sampler 2:

Project Information

Project Name: RACER Lansing
Street: 2800 W. Saginaw Hwy.
City: Lansing State: MI
Project #: 30042872.03700
Fax #:
Client Purchase Order #:

Analytical Information

PFAS via Method 537 mod. w/ isotope dilution per QSM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	CONTAINER INFORMATION MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NAOH+ZNA	DI WATER	MEOH	PFAS via Method 537 mod. w/ isotope dilution per QSM 5.1	LAB USE ONLY
1	MW-19-111_120120	12/1/20	1045	aw	GW	2		2								X	
2	MW-19-108_120120	12/1/20	1140	aw	GW	2		2								X	
3	MW-18-92_120120	12/1/20	1225	aw	GW	2		2								X	
4	MW-19-107_120120	12/1/20	1350	aw	GW	2		2								X	
5	MW-18-98_120120	12/1/20	1450	aw	GW	2		2								X	
6	MW-18-100_120120	12/1/20	1610	aw	GW	2		2								X	
7	MW-19-114_120220	12/2/20	0950	aw	GW	2		2								X	
8	MW-18-106_120220	12/2/20	1045	aw	GW	2		2								X	
9	MW-18-104_120220	12/2/20	1135	aw	GW	2		2								X	
10	MW-18-102_120220	12/2/20	1305	aw	GW	2		2								X	
11	MW-19-112_120220	12/2/20	1425	aw	GW	2		2								X	
12	MW-18-99_120220	12/2/20	1525	aw	GW	2		2								X	

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

★Report EGLE 28 compounds

INITIAL ASSESSMENT
B6
VERIFICATION

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1 Arcadis	12/2/20 1830	2 FedEx	3 FK	12/03/20 1030	4
Relinquished by/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
5		6	7		8

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 3.2

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA81363: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA81363 **Client:** ARCADIS **Project:** RACER LANSING

Date / Time Received: 12/3/2020 10:30:00 AM **Delivery Method:** FED EX **Airbill #'s:** 138665997372

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.0);

Cooler Temps (Corrected) °C: Cooler 1: (3.2);

Cooler Information	Y	N
1. Custody Seals Present	☑	☐
2. Custody Seals Intact	☑	☐
3. Temp criteria achieved	☑	☐
4. Cooler temp verification	IR Gun	
5. Cooler media	Ice (Bag)	

Trip Blank Information	Y	N	N/A
1. Trip Blank present / cooler	☐	☐	☑
2. Trip Blank listed on COC	☐	☐	☑

	W	S	N/A
3. Type Of TB Received	☐	☐	☑

Sample Information	Y	N	N/A
1. Sample labels present on bottles	☑	☐	
2. Samples preserved properly	☑	☐	
3. Sufficient volume/containers recvd for analysis:	☑	☐	
4. Condition of sample	Intact		
5. Sample recvd within HT	☑	☐	
6. Dates/Times/IDs on COC match Sample Label	☑	☐	
7. VOCs have headspace	☐	☐	☑
8. Bottles received for unspecified tests	☐	☑	
9. Compositing instructions clear	☐	☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐	☐	☑
11. % Solids Jar received?	☐	☐	☑
12. Residual Chlorine Present?	☐	☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: CARLOSD Date: 12/3/2020 10:30:00 A Reviewer: _____ Date: _____

FA81363: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MB	2Q59362.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-10, FA81363-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	91%	35-135%
	13C5-PFPeA	89%	50-150%
	13C5-PFHxA	90%	50-150%
	13C4-PFHpA	90%	50-150%

Method Blank Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MB	2Q59362.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-10, FA81363-12

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	92%	50-150%
	13C9-PFNA	94%	50-150%
	13C6-PFDA	95%	50-150%
	13C7-PFUnDA	89%	40-140%
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	79%	30-130%
	13C3-PFBS	91%	50-150%
	13C3-PFHxS	90%	50-150%
	13C8-PFOS	96%	50-150%
	13C8-FOSA	80%	30-130%
	d3-MeFOSAA	104%	50-150%
	d5-EtFOSAA	97%	50-150%
	13C2-4:2FTS	89%	50-150%
	13C2-6:2FTS	92%	50-150%
	13C2-8:2FTS	93%	50-150%
	13C3-HFPO-DA	96%	50-150%

Method Blank Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83269-MB	4Q8842.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-1, FA81363-2, FA81363-3, FA81363-5, FA81363-6, FA81363-7, FA81363-8, FA81363-9

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	95%	50-150%
	13C4-PFHpA	95%	50-150%
	13C8-PFOA	96%	50-150%
	13C9-PFNA	96%	50-150%

Method Blank Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83269-MB	4Q8842.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-1, FA81363-2, FA81363-3, FA81363-5, FA81363-6, FA81363-7, FA81363-8, FA81363-9

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	97%	50-150%
	13C7-PFUnDA	92%	40-140%
	13C2-PFDoDA	90%	40-140%
	13C2-PFTeDA	88%	30-130%
	13C3-PFBS	95%	50-150%
	13C3-PFHxS	93%	50-150%
	13C8-PFOS	95%	50-150%
	d3-MeFOSAA	108%	50-150%
	d5-EtFOSAA	105%	50-150%

Method Blank Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83335-MB	2Q59623.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-4

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	77%	50-150%
	13C4-PFHpA	77%	50-150%
	13C8-PFOA	78%	50-150%
	13C9-PFNA	77%	50-150%

Method Blank Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83335-MB	2Q59623.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-4

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	78%	50-150%
	13C7-PFUnDA	73%	40-140%
	13C2-PFDoDA	67%	40-140%
	13C2-PFTeDA	64%	30-130%
	13C3-PFBS	79%	50-150%
	13C3-PFHxS	81%	50-150%
	13C8-PFOS	80%	50-150%
	d3-MeFOSAA	78%	50-150%
	d5-EtFOSAA	77%	50-150%
	13C3-HFPO-DA	84%	50-150%

Method Blank Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83342-MB	4Q9127.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-11

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	77%	35-135%
	13C5-PFPeA	84%	50-150%
	13C5-PFHxA	85%	50-150%
	13C4-PFHpA	86%	50-150%

Method Blank Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83342-MB	4Q9127.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-11

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	84%	50-150%
	13C9-PFNA	88%	50-150%
	13C6-PFDA	86%	50-150%
	13C7-PFUnDA	84%	40-140%
	13C2-PFDoDA	79%	40-140%
	13C2-PFTeDA	74%	30-130%
	13C3-PFBS	86%	50-150%
	13C3-PFHxS	85%	50-150%
	13C8-PFOS	82%	50-150%
	13C8-FOSA	96%	30-130%
	d3-MeFOSAA	76%	50-150%
	d5-EtFOSAA	71%	50-150%
	13C2-4:2FTS	85%	50-150%
	13C2-6:2FTS	90%	50-150%
	13C2-8:2FTS	91%	50-150%
	13C3-HFPO-DA	76%	50-150%

Instrument Blank

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q122-IBLK	4Q8782.D	1	12/08/20	NAF	n/a	n/a	S4Q122

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81363-1, FA81363-2, FA81363-3, FA81363-5, FA81363-6, FA81363-7, FA81363-8, FA81363-9

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFHpA	104%	50-150%
	13C8-PFOA	105%	50-150%
	13C9-PFNA	106%	50-150%
	13C3-PFBS	103%	50-150%

Instrument Blank

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q122-IBLK	4Q8782.D	1	12/08/20	NAF	n/a	n/a	S4Q122

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81363-1, FA81363-2, FA81363-3, FA81363-5, FA81363-6, FA81363-7, FA81363-8, FA81363-9

CAS No.	ID Standard Recoveries		Limits
	13C3-PFHxS	102%	50-150%
	13C8-PFOS	103%	50-150%

Instrument Blank

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q871-IBLK	2Q59334.D	1	12/08/20	NAF	n/a	n/a	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81363-10, FA81363-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	97%	50-150%
	13C4-PFHpA	99%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	102%	50-150%

Instrument Blank

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q871-IBLK	2Q59334.D	1	12/08/20	NAF	n/a	n/a	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81363-10, FA81363-12

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	103%	50-150%
	13C7-PFUnDA	102%	50-150%
	13C2-PFDoDA	102%	50-150%
	13C2-PFTeDA	104%	50-150%
	13C3-PFBS	99%	50-150%
	13C3-PFHxS	98%	50-150%
	13C8-PFOS	106%	50-150%
	d3-MeFOSAA	114%	50-150%
	d5-EtFOSAA	115%	50-150%

Instrument Blank

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q458-IBLK	3Q31053.D	1	12/09/20	MRE	n/a	n/a	S3Q458

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81363-12

CAS No.	Compound	Result	RL	MDL	Units	Q
72629-94-8	Perfluorotridecanoic acid	ND	0.0080	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0080	0.0020	ug/l	
754-91-6	PFOSA	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	100%	50-150%
	13C5-PFPeA	98%	50-150%
	13C5-PFHxA	98%	50-150%
	13C4-PFHpA	98%	50-150%
	13C8-PFOA	99%	50-150%
	13C9-PFNA	98%	50-150%
	13C6-PFDA	99%	50-150%
	13C7-PFUnDA	101%	50-150%
	13C2-PFDoDA	100%	50-150%
	13C2-PFTeDA	107%	50-150%
	13C3-PFBS	100%	50-150%
	13C3-PFHxS	99%	50-150%
	13C8-PFOS	99%	50-150%
	13C8-FOSA	103%	50-150%
	d3-MeFOSAA	96%	50-150%
	d5-EtFOSAA	99%	50-150%
	13C2-4:2FTS	90%	50-150%
	13C2-6:2FTS	90%	50-150%
	13C2-8:2FTS	91%	50-150%
	13C3-HFPO-DA	94%	50-150%

Instrument Blank

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q875-IBLK	2Q59596.D	1	12/13/20	NAF	n/a	n/a	S2Q875

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81363-4

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	100%	50-150%
	13C4-PFHpA	101%	50-150%
	13C8-PFOA	102%	50-150%
	13C9-PFNA	100%	50-150%

Instrument Blank

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q875-IBLK	2Q59596.D	1	12/13/20	NAF	n/a	n/a	S2Q875

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81363-4

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	101%	50-150%
	13C7-PFUnDA	101%	50-150%
	13C2-PFDoDA	99%	50-150%
	13C2-PFTeDA	98%	50-150%
	13C3-PFBS	100%	50-150%
	13C3-PFHxS	101%	50-150%
	13C8-PFOS	100%	50-150%
	d3-MeFOSAA	101%	50-150%
	d5-EtFOSAA	102%	50-150%

Instrument Blank

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q125-IBLK	4Q9123.D	1	12/14/20	MV	n/a	n/a	S4Q125

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81363-11

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFHpA	94%	50-150%
	13C8-PFOA	91%	50-150%
	13C9-PFNA	96%	50-150%
	13C3-PFBS	96%	50-150%

Instrument Blank

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q125-IBLK	4Q9123.D	1	12/14/20	MV	n/a	n/a	S4Q125

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81363-11

CAS No.	ID Standard Recoveries		Limits
	13C3-PFHxS	95%	50-150%
	13C8-PFOS	92%	50-150%

Blank Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-BS	2Q59361.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-10, FA81363-12

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0762	95	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0822	103	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0808	101	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0903	113	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0792	99	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0769	96	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0806	101	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0794	99	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0771	96	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0794	99	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0760	95	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0786	98	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0755	94	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0731	91	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0861	108	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0791	99	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0757	95	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0757	95	60-130
754-91-6	PFOSA	0.08	0.0800	100	70-130
2355-31-9	MeFOSAA	0.08	0.0795	99	70-130
2991-50-6	EtFOSAA	0.08	0.0764	96	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0818	102	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0851	106	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0817	102	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0771	96	60-140
919005-14-4	ADONA	0.08	0.0753	94	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0754	94	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0773	97	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	87%	35-135%
	13C5-PFPeA	86%	50-150%
	13C5-PFHxA	86%	50-150%
	13C4-PFHpA	86%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-BS	2Q59361.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-10, FA81363-12

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	89%	50-150%
	13C9-PFNA	90%	50-150%
	13C6-PFDA	91%	50-150%
	13C7-PFUnDA	85%	40-140%
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	82%	30-130%
	13C3-PFBS	89%	50-150%
	13C3-PFHxS	87%	50-150%
	13C8-PFOS	93%	50-150%
	13C8-FOSA	74%	30-130%
	d3-MeFOSAA	98%	50-150%
	d5-EtFOSAA	94%	50-150%
	13C2-4:2FTS	90%	50-150%
	13C2-6:2FTS	92%	50-150%
	13C2-8:2FTS	95%	50-150%
	13C3-HFPO-DA	93%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83269-BS	4Q8841.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-1, FA81363-2, FA81363-3, FA81363-5, FA81363-6, FA81363-7, FA81363-8, FA81363-9

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0779	97	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0766	96	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0761	95	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0765	96	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0759	95	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0750	94	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0763	95	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0752	94	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0777	97	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0806	101	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0774	97	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0778	97	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0747	93	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0749	94	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0783	98	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0754	94	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0749	94	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0699	87	60-130
754-91-6	PFOSA	0.08	0.0741	93	70-130
2355-31-9	MeFOSAA	0.08	0.0764	96	70-130
2991-50-6	EtFOSAA	0.08	0.0781	98	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0750	94	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0762	95	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0755	94	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0727	91	60-140
919005-14-4	ADONA	0.08	0.0731	91	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0687	86	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0742	93	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C5-PFHxA	104%	50-150%
	13C4-PFHpA	104%	50-150%
	13C8-PFOA	105%	50-150%
	13C9-PFNA	105%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83269-BS	4Q8841.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-1, FA81363-2, FA81363-3, FA81363-5, FA81363-6, FA81363-7, FA81363-8, FA81363-9

CAS No.	ID Standard Recoveries	BSP	Limits
	13C6-PFDA	104%	50-150%
	13C7-PFUnDA	101%	40-140%
	13C2-PFDoDA	98%	40-140%
	13C2-PFTeDA	89%	30-130%
	13C3-PFBS	103%	50-150%
	13C3-PFHxS	104%	50-150%
	13C8-PFOS	103%	50-150%
	d3-MeFOSAA	113%	50-150%
	d5-EtFOSAA	113%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83335-BS	2Q59622.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0846	106	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0846	106	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0836	105	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0855	107	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0847	106	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0832	104	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0824	103	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0855	107	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0852	107	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0880	110	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0847	106	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0818	102	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0810	101	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0814	102	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0798	100	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0825	103	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0815	102	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0808	101	60-130
754-91-6	PFOSA	0.08	0.0830	104	70-130
2355-31-9	MeFOSAA	0.08	0.0851	106	70-130
2991-50-6	EtFOSAA	0.08	0.0837	105	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0851	106	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0829	104	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0841	105	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0727	91	60-140
919005-14-4	ADONA	0.08	0.0815	102	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0832	104	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0809	101	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C5-PFHxA	85%	50-150%
	13C4-PFHpA	83%	50-150%
	13C8-PFOA	85%	50-150%
	13C9-PFNA	83%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83335-BS	2Q59622.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-4

CAS No.	ID Standard Recoveries	BSP	Limits
	13C6-PFDA	84%	50-150%
	13C7-PFUnDA	79%	40-140%
	13C2-PFDoDA	75%	40-140%
	13C2-PFTeDA	67%	30-130%
	13C3-PFBS	87%	50-150%
	13C3-PFHxS	88%	50-150%
	13C8-PFOS	86%	50-150%
	d3-MeFOSAA	86%	50-150%
	d5-EtFOSAA	83%	50-150%
	13C3-HFPO-DA	94%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83342-BS	4Q9126.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-11

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0784	98	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0739	92	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0739	92	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0735	92	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0754	94	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0727	91	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0755	94	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0733	92	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0737	92	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0791	99	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0764	96	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0760	95	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0704	88	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0719	90	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0753	94	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0750	94	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0728	91	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0693	87	60-130
754-91-6	PFOSA	0.08	0.0671	84	70-130
2355-31-9	MeFOSAA	0.08	0.0744	93	70-130
2991-50-6	EtFOSAA	0.08	0.0727	91	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0729	91	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0726	91	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0741	93	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0736	92	60-140
919005-14-4	ADONA	0.08	0.0729	91	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0698	87	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0749	94	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	78%	35-135%
	13C5-PFPeA	84%	50-150%
	13C5-PFHxA	85%	50-150%
	13C4-PFHpA	86%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83342-BS	4Q9126.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-11

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	84%	50-150%
	13C9-PFNA	87%	50-150%
	13C6-PFDA	85%	50-150%
	13C7-PFUnDA	85%	40-140%
	13C2-PFDoDA	81%	40-140%
	13C2-PFTeDA	76%	30-130%
	13C3-PFBS	86%	50-150%
	13C3-PFHxS	88%	50-150%
	13C8-PFOS	87%	50-150%
	13C8-FOSA	91%	30-130%
	d3-MeFOSAA	72%	50-150%
	d5-EtFOSAA	72%	50-150%
	13C2-4:2FTS	89%	50-150%
	13C2-6:2FTS	93%	50-150%
	13C2-8:2FTS	94%	50-150%
	13C3-HFPO-DA	77%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MS	3Q31069.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31067.D	1	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31068.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-10, FA81363-12

CAS No.	Compound	FA81389-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0027	J	0.0714	0.0719	97	70-130
2706-90-3	Perfluoropentanoic acid	0.0021		0.0714	0.0702	95	70-130
307-24-4	Perfluorohexanoic acid	0.0023		0.0714	0.0742	101	70-130
375-85-9	Perfluoroheptanoic acid	0.0021		0.0714	0.0788	107	70-130
335-67-1	Perfluorooctanoic acid	0.0072		0.0714	0.0797	102	70-130
375-95-1	Perfluorononanoic acid	0.0013	J	0.0714	0.0694	95	70-130
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0708	99	70-130
2058-94-8	Perfluoroundecanoic acid	ND [b]		0.0714	0.0663	93	70-130
307-55-1	Perfluorododecanoic acid	ND [b]		0.0714	0.0647	91	70-130
72629-94-8	Perfluorotridecanoic acid	ND [b]		0.0714	0.113	158*	65-130
376-06-7	Perfluorotetradecanoic acid	ND [b]		0.0714	0.0507	71	70-130
375-73-5	Perfluorobutanesulfonic acid	ND		0.0714	0.0702	98	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0686	96	70-130
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0657	92	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.101	141*	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0035		0.0714	0.0740	99	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0268	38*	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0316	44*	60-130
754-91-6	PFOSA	ND [b]		0.0714	0.0577	81	70-130
2355-31-9	MeFOSAA	ND [b]		0.0714	0.0748	105	70-130
2991-50-6	EtFOSAA	ND [b]		0.0714	0.0828	116	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0714	0.0699	98	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0746	104	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0721	101	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0721	101	60-140
919005-14-4	ADONA	ND		0.0714	0.0703	98	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0748	105	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND [b]		0.0714	0.116	162*	60-140

CAS No.	ID Standard Recoveries	MS	FA81389-1	FA81389-1	Limits
	13C4-PFBA	88%	77%	99%	35-135%
	13C5-PFPeA	88%	79%	98%	50-150%
	13C5-PFHxA	87%	78%	97%	50-150%
	13C4-PFHpA	86%	78%	98%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MS	3Q31069.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31067.D	1	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31068.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-10, FA81363-12

CAS No.	ID Standard Recoveries	MS	FA81389-1	FA81389-1	Limits
	13C8-PFOA	86%	80%	99%	50-150%
	13C9-PFNA	72%	73%	92%	50-150%
	13C6-PFDA	42%* [c]	56%	77%	50-150%
	13C7-PFUnDA	13%* [c]	28%* [d]	50%	40-140%
	13C2-PFDoDA	4%* [c]	7%* [d]	23%* [d]	40-140%
	13C2-PFTeDA	1%* [c]	0%* [d]	3%* [d]	30-130%
	13C3-PFBS	88%	80%	101%	50-150%
	13C3-PFHxS	86%	81%	97%	50-150%
	13C8-PFOS	59%	67%	87%	50-150%
	13C8-FOSA	2%* [c]	4%* [d]	6%* [d]	30-130%
	d3-MeFOSAA	12%* [c]	30%* [d]	48%* [d]	50-150%
	d5-EtFOSAA	7%* [c]	21%* [d]	40%* [d]	50-150%
	13C2-4:2FTS	85%	73%	92%	50-150%
	13C2-6:2FTS	82%	75%	92%	50-150%
	13C2-8:2FTS	45%* [c]	56%	74%	50-150%
	13C3-HFPO-DA	76%	69%	84%	50-150%

(a) Insufficient sample for re-extraction.
(b) Result is from Run #2.
(c) Outside control limits.
(d) Outside control limits due to matrix interference. Confirmed by MS/MSD.

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83269-MS	4Q8855.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122
FA81389-5	4Q8854.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-1, FA81363-2, FA81363-3, FA81363-5, FA81363-6, FA81363-7, FA81363-8, FA81363-9

CAS No.	Compound	FA81389-5 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	ND		0.0769	0.0735	96	70-130
2706-90-3	Perfluoropentanoic acid	ND		0.0769	0.0736	96	70-130
307-24-4	Perfluorohexanoic acid	ND		0.0769	0.0735	96	70-130
375-85-9	Perfluoroheptanoic acid	ND		0.0769	0.0734	95	70-130
335-67-1	Perfluorooctanoic acid	ND		0.0769	0.0740	96	70-130
375-95-1	Perfluorononanoic acid	ND		0.0769	0.0723	94	70-130
335-76-2	Perfluorodecanoic acid	ND		0.0769	0.0731	95	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.0769	0.0738	96	70-130
307-55-1	Perfluorododecanoic acid	ND		0.0769	0.0745	97	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.0769	0.0735	96	65-130
376-06-7	Perfluorotetradecanoic acid	ND		0.0769	0.0747	97	70-130
375-73-5	Perfluorobutanesulfonic acid	ND		0.0769	0.0747	97	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0769	0.0737	96	70-130
355-46-4	Perfluorohexanesulfonic acid	ND		0.0769	0.0712	93	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0769	0.0747	97	70-130
1763-23-1	Perfluorooctanesulfonic acid	ND		0.0769	0.0708	92	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0769	0.0727	95	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0769	0.0699	91	60-130
754-91-6	PFOSA	ND		0.0769	0.0732	95	70-130
2355-31-9	MeFOSAA	ND		0.0769	0.0739	96	70-130
2991-50-6	EtFOSAA	ND		0.0769	0.0766	100	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0769	0.0716	93	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0769	0.0721	94	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0769	0.0717	93	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.0769	0.0691	90	60-140
919005-14-4	ADONA	ND		0.0769	0.0695	90	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.0769	0.0663	86	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		0.0769	0.0726	94	60-140

CAS No.	ID Standard Recoveries	MS	FA81389-5	Limits
	13C4-PFBA		94%	35-135%
	13C5-PFPeA		100%	50-150%
	13C5-PFHxA	91%	101%	50-150%
	13C4-PFHpA	93%	102%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83269-MS	4Q8855.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122
FA81389-5	4Q8854.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-1, FA81363-2, FA81363-3, FA81363-5, FA81363-6, FA81363-7, FA81363-8, FA81363-9

CAS No.	ID Standard Recoveries	MS	FA81389-5	Limits
	13C8-PFOA	94%	103%	50-150%
	13C9-PFNA	95%	104%	50-150%
	13C6-PFDA	93%	103%	50-150%
	13C7-PFUnDA	89%	94%	40-140%
	13C2-PFDoDA	87%	89%	40-140%
	13C2-PFTeDA	85%	85%	30-130%
	13C3-PFBS	90%	98%	50-150%
	13C3-PFHxS	93%	101%	50-150%
	13C8-PFOS	94%	100%	50-150%
	13C8-FOSA		91%	30-130%
	d3-MeFOSAA	92%	103%	50-150%
	d5-EtFOSAA	89%	95%	50-150%
	13C2-4:2FTS		96%	50-150%
	13C2-6:2FTS		101%	50-150%
	13C2-8:2FTS		99%	50-150%
	13C3-HFPO-DA		105%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83335-MS	2Q59630.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875
FA81498-33	2Q59629.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-4

CAS No.	Compound	FA81498-33 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0152		0.16	0.185	106	70-130
2706-90-3	Perfluoropentanoic acid	0.0592		0.16	0.228	106	70-130
307-24-4	Perfluorohexanoic acid	0.0360		0.16	0.203	104	70-130
375-85-9	Perfluoroheptanoic acid	0.0320		0.16	0.204	108	70-130
335-67-1	Perfluorooctanoic acid	0.0287		0.16	0.202	108	70-130
375-95-1	Perfluorononanoic acid	0.0129		0.16	0.177	103	70-130
335-76-2	Perfluorodecanoic acid	ND		0.16	0.164	103	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.16	0.173	108	70-130
307-55-1	Perfluorododecanoic acid	ND		0.16	0.173	108	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.16	0.172	108	65-130
376-06-7	Perfluorotetradecanoic acid	ND		0.16	0.168	105	70-130
375-73-5	Perfluorobutanesulfonic acid	ND		0.16	0.167	104	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.16	0.164	103	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0184		0.16	0.186	105	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.16	0.169	106	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0061		0.16	0.170	102	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.16	0.162	101	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.16	0.168	105	60-130
754-91-6	PFOSA	ND		0.16	0.167	104	70-130
2355-31-9	MeFOSAA	ND		0.16	0.172	108	70-130
2991-50-6	EtFOSAA	ND		0.16	0.160	100	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.16	0.167	104	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.0046	J	0.16	0.176	107	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.16	0.166	104	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.16	0.151	94	60-140
919005-14-4	ADONA	ND		0.16	0.161	101	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.16	0.163	102	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		0.16	0.172	108	60-140

CAS No.	ID Standard Recoveries	MS	FA81498-33	Limits
	13C5-PFHxA	89%	88%	50-150%
	13C4-PFHpA	87%	87%	50-150%
	13C8-PFOA	90%	90%	50-150%
	13C9-PFNA	90%	88%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83335-MS	2Q59630.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875
FA81498-33	2Q59629.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-4

CAS No.	ID Standard Recoveries	MS	FA81498-33	Limits
	13C6-PFDA	90%	90%	50-150%
	13C7-PFUnDA	84%	85%	40-140%
	13C2-PFDoDA	83%	83%	40-140%
	13C2-PFTeDA	80%	79%	30-130%
	13C3-PFBS	89%	87%	50-150%
	13C3-PFHxS	87%	87%	50-150%
	13C8-PFOS	93%	90%	50-150%
	d3-MeFOSAA	91%	92%	50-150%
	d5-EtFOSAA	90%	90%	50-150%
	13C3-HFPO-DA	97%	95%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83342-MS	4Q9147.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125
FA81498-22	4Q9146.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-11

CAS No.	Compound	FA81498-22 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	ND		0.167	0.153	92	70-130
2706-90-3	Perfluoropentanoic acid	ND		0.167	0.150	90	70-130
307-24-4	Perfluorohexanoic acid	ND		0.167	0.152	91	70-130
375-85-9	Perfluoroheptanoic acid	ND		0.167	0.149	89	70-130
335-67-1	Perfluorooctanoic acid	ND		0.167	0.152	91	70-130
375-95-1	Perfluorononanoic acid	ND		0.167	0.147	88	70-130
335-76-2	Perfluorodecanoic acid	ND		0.167	0.157	94	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.167	0.150	90	70-130
307-55-1	Perfluorododecanoic acid	ND		0.167	0.152	91	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.167	0.160	96	65-130
376-06-7	Perfluorotetradecanoic acid	ND		0.167	0.157	94	70-130
375-73-5	Perfluorobutanesulfonic acid	ND		0.167	0.153	92	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.167	0.146	88	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0036	J	0.167	0.153	90	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.167	0.158	95	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0040	J	0.167	0.158	92	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.167	0.146	88	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.167	0.137	82	60-130
754-91-6	PFOSA	ND		0.167	0.141	85	70-130
2355-31-9	MeFOSAA	ND		0.167	0.147	88	70-130
2991-50-6	EtFOSAA	ND		0.167	0.150	90	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.167	0.145	87	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.167	0.150	90	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.167	0.150	90	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.167	0.156	94	60-140
919005-14-4	ADONA	ND		0.167	0.146	88	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.167	0.140	84	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		0.167	0.149	89	60-140

CAS No.	ID Standard Recoveries	MS	FA81498-22	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	83%		50-150%
	13C5-PFHxA	84%	88%	50-150%
	13C4-PFHpA	86%	91%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83342-MS	4Q9147.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125
FA81498-22	4Q9146.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-11

CAS No.	ID Standard Recoveries	MS	FA81498-22	Limits
	13C8-PFOA	85%	89%	50-150%
	13C9-PFNA	88%	94%	50-150%
	13C6-PFDA	81%	91%	50-150%
	13C7-PFUnDA	79%	87%	40-140%
	13C2-PFDoDA	75%	83%	40-140%
	13C2-PFTeDA	72%	80%	30-130%
	13C3-PFBS	84%	88%	50-150%
	13C3-PFHxS	84%	89%	50-150%
	13C8-PFOS	82%	86%	50-150%
	13C8-FOSA	94%		30-130%
	d3-MeFOSAA	71%	80%	50-150%
	d5-EtFOSAA	69%	76%	50-150%
	13C2-4:2FTS	90%		50-150%
	13C2-6:2FTS	93%		50-150%
	13C2-8:2FTS	91%		50-150%
	13C3-HFPO-DA	74%	78%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-DUP	2Q59369.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871
FA81366-2	2Q59368.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-10, FA81363-12

CAS No.	Compound	FA81366-2 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.0447		0.0440		2	30
2706-90-3	Perfluoropentanoic acid	0.0723		0.0718		1	30
307-24-4	Perfluorohexanoic acid	0.0956		0.0898		6	30
375-85-9	Perfluoroheptanoic acid	0.0556		0.0539		3	30
335-67-1	Perfluorooctanoic acid	0.0912		0.0886		3	30
375-95-1	Perfluorononanoic acid	0.0098		0.0096		2	30
335-76-2	Perfluorodecanoic acid	0.0169		0.0174		3	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0011	J	ND		200*	30
2706-91-4	Perfluoropentanesulfonic acid	ND		ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	0.0019		0.0012	J	45*	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0660		0.0650		2	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA81366-2	Limits
	13C4-PFBA	70%	63%	35-135%
	13C5-PFPeA	68%	62%	50-150%
	13C5-PFHxA	64%	58%	50-150%
	13C4-PFHpA	59%	54%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-DUP	2Q59369.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871
FA81366-2	2Q59368.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-10, FA81363-12

CAS No.	ID Standard Recoveries	DUP	FA81366-2	Limits
	13C8-PFOA	63%	58%	50-150%
	13C9-PFNA	68%	62%	50-150%
	13C6-PFDA	69%	64%	50-150%
	13C7-PFUnDA	61%	54%	40-140%
	13C2-PFDoDA	51%	41%	40-140%
	13C2-PFTeDA	13%* [a]	8%* [a]	30-130%
	13C3-PFBS	75%	68%	50-150%
	13C3-PFHxS	70%	62%	50-150%
	13C8-PFOS	76%	70%	50-150%
	13C8-FOSA	13%* [a]	13%* [a]	30-130%
	d3-MeFOSAA	65%	59%	50-150%
	d5-EtFOSAA	63%	57%	50-150%
	13C2-4:2FTS	67%	61%	50-150%
	13C2-6:2FTS	70%	64%	50-150%
	13C2-8:2FTS	79%	71%	50-150%
	13C3-HFPO-DA	71%	64%	50-150%

(a) Outside control limits.

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83269-DUP	4Q8857.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122
FA81389-6	4Q8856.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-1, FA81363-2, FA81363-3, FA81363-5, FA81363-6, FA81363-7, FA81363-8, FA81363-9

CAS No.	Compound	FA81389-6 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	ND		ND		nc	30
2706-90-3	Perfluoropentanoic acid	0.0016	J	0.0016	J	0	30
307-24-4	Perfluorohexanoic acid	0.0011	J	0.0012	J	9	30
375-85-9	Perfluoroheptanoic acid	ND		ND		nc	30
335-67-1	Perfluorooctanoic acid	ND		ND		nc	30
375-95-1	Perfluorononanoic acid	ND		ND		nc	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	ND		ND		nc	30
2706-91-4	Perfluoropentanesulfonic acid	ND		ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	ND		ND		nc	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	ND		ND		nc	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA81389-6	Limits
	13C4-PFBA		91%	35-135%
	13C5-PFPeA		94%	50-150%
	13C5-PFHxA	90%	96%	50-150%
	13C4-PFHpA	92%	98%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83269-DUP	4Q8857.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122
FA81389-6	4Q8856.D	1	12/09/20	NAF	12/05/20	OP83269	S4Q122

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-1, FA81363-2, FA81363-3, FA81363-5, FA81363-6, FA81363-7, FA81363-8, FA81363-9

CAS No.	ID Standard Recoveries	DUP	FA81389-6	Limits
	13C8-PFOA	94%	100%	50-150%
	13C9-PFNA	93%	101%	50-150%
	13C6-PFDA	95%	100%	50-150%
	13C7-PFUnDA	89%	94%	40-140%
	13C2-PFDoDA	85%	88%	40-140%
	13C2-PFTeDA	83%	81%	30-130%
	13C3-PFBS	88%	94%	50-150%
	13C3-PFHxS	92%	98%	50-150%
	13C8-PFOS	92%	98%	50-150%
	13C8-FOSA		90%	30-130%
	d3-MeFOSAA	98%	103%	50-150%
	d5-EtFOSAA	90%	94%	50-150%
	13C2-4:2FTS		93%	50-150%
	13C2-6:2FTS		98%	50-150%
	13C2-8:2FTS		97%	50-150%
	13C3-HFPO-DA		101%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83335-DUP	2Q59639.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875
FA81498-39	2Q59638.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-4

CAS No.	Compound	FA81498-39 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.0078	J	0.0091		15	30
2706-90-3	Perfluoropentanoic acid	0.0295		0.0301		2	30
307-24-4	Perfluorohexanoic acid	0.0294		0.0284		3	30
375-85-9	Perfluoroheptanoic acid	0.0150		0.0156		4	30
335-67-1	Perfluorooctanoic acid	0.0236		0.0238		1	30
375-95-1	Perfluorononanoic acid	0.124		0.123		1	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0036	J	0.0037	J	3	30
2706-91-4	Perfluoropentanesulfonic acid	0.0042		0.0055		27	30
355-46-4	Perfluorohexanesulfonic acid	0.0359		0.0356		1	30
375-92-8	Perfluoroheptanesulfonic acid	0.0032	J	0.0032	J	0	30
1763-23-1	Perfluorooctanesulfonic acid	0.0893		0.0886		1	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	0.127		0.131		3	30
39108-34-4	8:2 Fluorotelomer sulfonate	0.0166		0.0165		1	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA81498-39	Limits
	13C5-PFHxA	90%	91%	50-150%
	13C4-PFHpA	88%	91%	50-150%
	13C8-PFOA	90%	93%	50-150%
	13C9-PFNA	91%	92%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83335-DUP	2Q59639.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875
FA81498-39	2Q59638.D	1	12/13/20	NAF	12/10/20	OP83335	S2Q875

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-4

CAS No.	ID Standard Recoveries	DUP	FA81498-39	Limits
	13C6-PFDA	95%	96%	50-150%
	13C7-PFUnDA	90%	93%	40-140%
	13C2-PFDoDA	88%	91%	40-140%
	13C2-PFTeDA	89%	91%	30-130%
	13C3-PFBS	90%	92%	50-150%
	13C3-PFHxS	90%	90%	50-150%
	13C8-PFOS	95%	96%	50-150%
	d3-MeFOSAA	98%	98%	50-150%
	d5-EtFOSAA	98%	98%	50-150%
	13C3-HFPO-DA	97%	98%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83342-DUP	4Q9154.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125
FA81498-26	4Q9153.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-11

CAS No.	Compound	FA81498-26 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	ND		ND		nc	30
2706-90-3	Perfluoropentanoic acid	0.0098		0.0097		1	30
307-24-4	Perfluorohexanoic acid	0.0072		0.0071		1	30
375-85-9	Perfluoroheptanoic acid	0.0053		0.0054		2	30
335-67-1	Perfluorooctanoic acid	0.0079		0.0081		2	30
375-95-1	Perfluorononanoic acid	0.0535		0.0547		2	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	ND		ND		nc	30
2706-91-4	Perfluoropentanesulfonic acid	ND		ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	0.0095		0.0092		3	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0353		0.0361		2	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	0.0375		0.0380		1	30
39108-34-4	8:2 Fluorotelomer sulfonate	0.0073	J	0.0073	J	0	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA81498-26	Limits
	13C4-PFBA	81%		35-135%
	13C5-PFPeA	87%		50-150%
	13C5-PFHxA	89%	82%	50-150%
	13C4-PFHpA	92%	85%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81363
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83342-DUP	4Q9154.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125
FA81498-26	4Q9153.D	1	12/14/20	MV	12/11/20	OP83342	S4Q125

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81363-11

CAS No.	ID Standard Recoveries	DUP	FA81498-26	Limits
	13C8-PFOA	91%	85%	50-150%
	13C9-PFNA	95%	89%	50-150%
	13C6-PFDA	92%	86%	50-150%
	13C7-PFUnDA	90%	84%	40-140%
	13C2-PFDoDA	84%	81%	40-140%
	13C2-PFTeDA	79%	79%	30-130%
	13C3-PFBS	88%	81%	50-150%
	13C3-PFHxS	88%	83%	50-150%
	13C8-PFOS	89%	82%	50-150%
	13C8-FOSA	108%		30-130%
	d3-MeFOSAA	81%	78%	50-150%
	d5-EtFOSAA	74%	74%	50-150%
	13C2-4:2FTS	89%		50-150%
	13C2-6:2FTS	98%		50-150%
	13C2-8:2FTS	95%		50-150%
	13C3-HFPO-DA	80%	74%	50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA81364

Sampling Date: 12/02/20

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Total number of pages in report: 24

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

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Test results relate only to samples analyzed.

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA81364

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
FA81364-1	12/02/20	11:25	JP	12/03/20	AQ	Ground Water	MW-14-61_120220

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Summary of Hits

Job Number: FA81364
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/02/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA81364-1	**MW-14-61_120220**					
Perfluoropentanoic acid		0.0024	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0010 J	0.0018	0.00089	ug/l	EPA 537M BY ID

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-14-61_120220		
Lab Sample ID:	FA81364-1	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59366.D	1	12/08/20 20:45	NAF	12/05/20 08:30	OP83270	S2Q871
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0024	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0010	0.0018	0.00089	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-61_120220		
Lab Sample ID:	FA81364-1	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%		35-135%
	13C5-PFPeA	71%		50-150%
	13C5-PFHxA	71%		50-150%
	13C4-PFHpA	71%		50-150%
	13C8-PFOA	78%		50-150%
	13C9-PFNA	83%		50-150%
	13C6-PFDA	85%		50-150%
	13C7-PFUnDA	75%		40-140%
	13C2-PFDoDA	70%		40-140%
	13C2-PFTeDA	58%		30-130%
	13C3-PFBS	77%		50-150%
	13C3-PFHxS	77%		50-150%
	13C8-PFOS	86%		50-150%
	13C8-FOSA	38%		30-130%
	d3-MeFOSAA	88%		50-150%
	d5-EtFOSAA	83%		50-150%
	13C2-4:2FTS	75%		50-150%
	13C2-6:2FTS	85%		50-150%
	13C2-8:2FTS	86%		50-150%
	13C3-HFPO-DA	80%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

SGS North America Inc - Orlando FA81364

SGS Plant 2

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL: 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # : PAGE 1 OF 1

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Tiffany.Linder@arcadis.com Email:
Phone #: 810-225-1928
Sampler(s) Name(s) (Printed): Sampler 1: Jake Bisschiew Sampler 2:

Project Information

Project Name: Racer Lansing
Street: 2800 W Saginaw Hwy
City: Lansing State: MI
Project #: 30042872 / 03700
Fax #:
Client Purchase Order #:

Analytical Information

PFAS 537 mod. w/ isotope dilution per ASM 5.3

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	CONTAINER INFORMATION MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NAOH+ZNA	DI WATER	MEOH	PFAS	LAB USE ONLY
1	MW-14-61-120220	12.2.20	1125	JJP	GW	2		2								X	

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

* Report EGLE 28 compounds
INITIAL ASSESSMENT BC
RE-EVALUATION

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1 Arcadis	12.2.20/1600	2 Arcadis	3 Arcadis	12/2/2020	4 FedEx
5 FedEx	12/3/20 1030	6 Caitlyn Reynolds	7		8

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 3.7

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA81364: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA81364 **Client:** ARCADIS **Project:** RACER LANSING

Date / Time Received: 12/3/2020 10:30:00 AM **Delivery Method:** FED EX **Airbill #'s:** 138665997372

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.0);

Cooler Temps (Corrected) °C: Cooler 1: (3.2);

Cooler Information	Y	N
1. Custody Seals Present	☑	☐
2. Custody Seals Intact	☑	☐
3. Temp criteria achieved	☑	☐
4. Cooler temp verification	IR Gun	
5. Cooler media	Ice (Bag)	

Trip Blank Information	Y	N	N/A
1. Trip Blank present / cooler	☐	☐	☑
2. Trip Blank listed on COC	☐	☐	☑

	W	S	N/A
3. Type Of TB Received	☐	☐	☑

Sample Information	Y	N	N/A
1. Sample labels present on bottles	☑	☐	
2. Samples preserved properly	☑	☐	
3. Sufficient volume/containers recvd for analysis:	☑	☐	
4. Condition of sample	Intact		
5. Sample recvd within HT	☑	☐	
6. Dates/Times/IDs on COC match Sample Label	☑	☐	
7. VOCs have headspace	☐	☐	☑
8. Bottles received for unspecified tests	☐	☑	
9. Compositing instructions clear	☐	☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐	☐	☑
11. % Solids Jar received?	☐	☐	☑
12. Residual Chlorine Present?	☐	☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: CARLOSD Date: 12/3/2020 10:30:00 A Reviewer: _____ Date: _____

FA81364: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MB	2Q59362.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81364-1

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	91%	35-135%
	13C5-PFPeA	89%	50-150%
	13C5-PFHxA	90%	50-150%
	13C4-PFHpA	90%	50-150%

Method Blank Summary

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MB	2Q59362.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81364-1

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	92%	50-150%
	13C9-PFNA	94%	50-150%
	13C6-PFDA	95%	50-150%
	13C7-PFUnDA	89%	40-140%
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	79%	30-130%
	13C3-PFBS	91%	50-150%
	13C3-PFHxS	90%	50-150%
	13C8-PFOS	96%	50-150%
	13C8-FOSA	80%	30-130%
	d3-MeFOSAA	104%	50-150%
	d5-EtFOSAA	97%	50-150%
	13C2-4:2FTS	89%	50-150%
	13C2-6:2FTS	92%	50-150%
	13C2-8:2FTS	93%	50-150%
	13C3-HFPO-DA	96%	50-150%

Instrument Blank

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q871-IBLK	2Q59334.D	1	12/08/20	NAF	n/a	n/a	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81364-1

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	97%	50-150%
	13C4-PFHpA	99%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	102%	50-150%

Instrument Blank

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q871-IBLK	2Q59334.D	1	12/08/20	NAF	n/a	n/a	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81364-1

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	103%	50-150%
	13C7-PFUnDA	102%	50-150%
	13C2-PFDoDA	102%	50-150%
	13C2-PFTeDA	104%	50-150%
	13C3-PFBS	99%	50-150%
	13C3-PFHxS	98%	50-150%
	13C8-PFOS	106%	50-150%
	d3-MeFOSAA	114%	50-150%
	d5-EtFOSAA	115%	50-150%

Instrument Blank

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q458-IBLK	3Q31053.D	1	12/09/20	MRE	n/a	n/a	S3Q458

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

OP83270-MS

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.016	0.0040	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0080	0.0020	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0080	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0080	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0080	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0080	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0080	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0080	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0080	0.0020	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0080	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0080	0.0020	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0080	0.0020	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0080	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0080	0.0020	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0080	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0080	0.0020	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0080	0.0020	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0080	0.0020	ug/l	
754-91-6	PFOSA	ND	0.0080	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.016	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.016	0.0040	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.016	0.0040	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.016	0.0040	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.016	0.0040	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.016	0.0040	ug/l	
919005-14-4	ADONA	ND	0.016	0.0040	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.016	0.0040	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.016	0.0040	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	100%	50-150%
	13C5-PFPeA	98%	50-150%
	13C5-PFHxA	98%	50-150%
	13C4-PFHpA	98%	50-150%

Instrument Blank

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q458-IBLK	3Q31053.D	1	12/09/20	MRE	n/a	n/a	S3Q458

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

OP83270-MS

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	99%	50-150%
	13C9-PFNA	98%	50-150%
	13C6-PFDA	99%	50-150%
	13C7-PFUnDA	101%	50-150%
	13C2-PFDoDA	100%	50-150%
	13C2-PFTeDA	107%	50-150%
	13C3-PFBS	100%	50-150%
	13C3-PFHxS	99%	50-150%
	13C8-PFOS	99%	50-150%
	13C8-FOSA	103%	50-150%
	d3-MeFOSAA	96%	50-150%
	d5-EtFOSAA	99%	50-150%
	13C2-4:2FTS	90%	50-150%
	13C2-6:2FTS	90%	50-150%
	13C2-8:2FTS	91%	50-150%
	13C3-HFPO-DA	94%	50-150%

Blank Spike Summary

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-BS	2Q59361.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81364-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0762	95	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0822	103	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0808	101	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0903	113	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0792	99	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0769	96	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0806	101	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0794	99	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0771	96	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0794	99	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0760	95	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0786	98	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0755	94	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0731	91	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0861	108	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0791	99	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0757	95	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0757	95	60-130
754-91-6	PFOSA	0.08	0.0800	100	70-130
2355-31-9	MeFOSAA	0.08	0.0795	99	70-130
2991-50-6	EtFOSAA	0.08	0.0764	96	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0818	102	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0851	106	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0817	102	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0771	96	60-140
919005-14-4	ADONA	0.08	0.0753	94	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0754	94	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0773	97	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	87%	35-135%
	13C5-PFPeA	86%	50-150%
	13C5-PFHxA	86%	50-150%
	13C4-PFHpA	86%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-BS	2Q59361.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81364-1

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	89%	50-150%
	13C9-PFNA	90%	50-150%
	13C6-PFDA	91%	50-150%
	13C7-PFUnDA	85%	40-140%
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	82%	30-130%
	13C3-PFBS	89%	50-150%
	13C3-PFHxS	87%	50-150%
	13C8-PFOS	93%	50-150%
	13C8-FOSA	74%	30-130%
	d3-MeFOSAA	98%	50-150%
	d5-EtFOSAA	94%	50-150%
	13C2-4:2FTS	90%	50-150%
	13C2-6:2FTS	92%	50-150%
	13C2-8:2FTS	95%	50-150%
	13C3-HFPO-DA	93%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MS	3Q31069.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31067.D	1	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31068.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81364-1

CAS No.	Compound	FA81389-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0027	J	0.0714	0.0719	97	70-130
2706-90-3	Perfluoropentanoic acid	0.0021		0.0714	0.0702	95	70-130
307-24-4	Perfluorohexanoic acid	0.0023		0.0714	0.0742	101	70-130
375-85-9	Perfluoroheptanoic acid	0.0021		0.0714	0.0788	107	70-130
335-67-1	Perfluorooctanoic acid	0.0072		0.0714	0.0797	102	70-130
375-95-1	Perfluorononanoic acid	0.0013	J	0.0714	0.0694	95	70-130
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0708	99	70-130
2058-94-8	Perfluoroundecanoic acid	ND [b]		0.0714	0.0663	93	70-130
307-55-1	Perfluorododecanoic acid	ND [b]		0.0714	0.0647	91	70-130
72629-94-8	Perfluorotridecanoic acid	ND [b]		0.0714	0.113	158*	65-130
376-06-7	Perfluorotetradecanoic acid	ND [b]		0.0714	0.0507	71	70-130
375-73-5	Perfluorobutanesulfonic acid	ND		0.0714	0.0702	98	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0686	96	70-130
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0657	92	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.101	141*	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0035		0.0714	0.0740	99	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0268	38*	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0316	44*	60-130
754-91-6	PFOSA	ND [b]		0.0714	0.0577	81	70-130
2355-31-9	MeFOSAA	ND [b]		0.0714	0.0748	105	70-130
2991-50-6	EtFOSAA	ND [b]		0.0714	0.0828	116	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0714	0.0699	98	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0746	104	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0721	101	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0721	101	60-140
919005-14-4	ADONA	ND		0.0714	0.0703	98	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0748	105	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND [b]		0.0714	0.116	162*	60-140

CAS No.	ID Standard Recoveries	MS	FA81389-1	FA81389-1	Limits
	13C4-PFBA	88%	77%	99%	35-135%
	13C5-PFPeA	88%	79%	98%	50-150%
	13C5-PFHxA	87%	78%	97%	50-150%
	13C4-PFHpA	86%	78%	98%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MS	3Q31069.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31067.D	1	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31068.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81364-1

CAS No.	ID Standard Recoveries	MS	FA81389-1	FA81389-1	Limits
	13C8-PFOA	86%	80%	99%	50-150%
	13C9-PFNA	72%	73%	92%	50-150%
	13C6-PFDA	42%* [c]	56%	77%	50-150%
	13C7-PFUnDA	13%* [c]	28%* [d]	50%	40-140%
	13C2-PFDoDA	4%* [c]	7%* [d]	23%* [d]	40-140%
	13C2-PFTeDA	1%* [c]	0%* [d]	3%* [d]	30-130%
	13C3-PFBS	88%	80%	101%	50-150%
	13C3-PFHxS	86%	81%	97%	50-150%
	13C8-PFOS	59%	67%	87%	50-150%
	13C8-FOSA	2%* [c]	4%* [d]	6%* [d]	30-130%
	d3-MeFOSAA	12%* [c]	30%* [d]	48%* [d]	50-150%
	d5-EtFOSAA	7%* [c]	21%* [d]	40%* [d]	50-150%
	13C2-4:2FTS	85%	73%	92%	50-150%
	13C2-6:2FTS	82%	75%	92%	50-150%
	13C2-8:2FTS	45%* [c]	56%	74%	50-150%
	13C3-HFPO-DA	76%	69%	84%	50-150%

(a) Insufficient sample for re-extraction.
(b) Result is from Run #2.
(c) Outside control limits.
(d) Outside control limits due to matrix interference. Confirmed by MS/MSD.

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-DUP	2Q59369.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871
FA81366-2	2Q59368.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81364-1

CAS No.	Compound	FA81366-2 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.0447		0.0440		2	30
2706-90-3	Perfluoropentanoic acid	0.0723		0.0718		1	30
307-24-4	Perfluorohexanoic acid	0.0956		0.0898		6	30
375-85-9	Perfluoroheptanoic acid	0.0556		0.0539		3	30
335-67-1	Perfluorooctanoic acid	0.0912		0.0886		3	30
375-95-1	Perfluorononanoic acid	0.0098		0.0096		2	30
335-76-2	Perfluorodecanoic acid	0.0169		0.0174		3	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0011	J	ND		200*	30
2706-91-4	Perfluoropentanesulfonic acid	ND		ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	0.0019		0.0012	J	45*	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0660		0.0650		2	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA81366-2	Limits
	13C4-PFBA	70%	63%	35-135%
	13C5-PFPeA	68%	62%	50-150%
	13C5-PFHxA	64%	58%	50-150%
	13C4-PFHpA	59%	54%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81364
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-DUP	2Q59369.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871
FA81366-2	2Q59368.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81364-1

CAS No.	ID Standard Recoveries	DUP	FA81366-2	Limits
	13C8-PFOA	63%	58%	50-150%
	13C9-PFNA	68%	62%	50-150%
	13C6-PFDA	69%	64%	50-150%
	13C7-PFUnDA	61%	54%	40-140%
	13C2-PFDoDA	51%	41%	40-140%
	13C2-PFTeDA	13%* [a]	8%* [a]	30-130%
	13C3-PFBS	75%	68%	50-150%
	13C3-PFHxS	70%	62%	50-150%
	13C8-PFOS	76%	70%	50-150%
	13C8-FOSA	13%* [a]	13%* [a]	30-130%
	d3-MeFOSAA	65%	59%	50-150%
	d5-EtFOSAA	63%	57%	50-150%
	13C2-4:2FTS	67%	61%	50-150%
	13C2-6:2FTS	70%	64%	50-150%
	13C2-8:2FTS	79%	71%	50-150%
	13C3-HFPO-DA	71%	64%	50-150%

(a) Outside control limits.

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA81366

Sampling Date: 12/02/20

Report to:

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Total number of pages in report: **48**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

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Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA81366

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA81366-1	12/02/20	09:15	BC	12/03/20	AQ	Equipment Blank	EB-01_120220
FA81366-2	12/02/20	10:15	BC	12/03/20	AQ	Ground Water	MW-12-12_120220
FA81366-3	12/02/20	11:20	BC	12/03/20	AQ	Ground Water	MW-14-70_120220
FA81366-4	12/02/20	12:10	BC	12/03/20	AQ	Ground Water	MW-12-13_120220
FA81366-5	12/02/20	13:10	BC	12/03/20	AQ	Ground Water	MW-14-67_120220
FA81366-6	12/02/20	13:55	BC	12/03/20	AQ	Ground Water	MW-13-36R_120220
FA81366-7	12/02/20	15:00	BC	12/03/20	AQ	Ground Water	P6-SB-07_120220
FA81366-8	12/02/20	00:00	BC	12/03/20	AQ	Ground Water	DUP-02_120220

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Summary of Hits

Job Number: FA81366
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/02/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA81366-1	**EB-01_120220**					
No hits reported in this sample.						
FA81366-2	**MW-12-12_120220**					
Perfluorobutanoic acid		0.0447	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0723	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0956	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0556	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0912	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0098	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0169	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0019	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0660	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81366-3	**MW-14-70_120220**					
Perfluorobutanoic acid		0.116	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.426	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.279	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.107	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0074	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0037	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0012 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81366-4	**MW-12-13_120220**					
Perfluorobutanoic acid		0.0326	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0419	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0616	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0156	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0019	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81366-5	**MW-14-67_120220**					
Perfluorobutanoic acid		0.0592	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0768	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0984	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0422	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0271	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0036	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81366
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/02/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorooctanesulfonic acid		0.0078	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81366-6	**MW-13-36R_120220**					
Perfluorobutanoic acid [a]		0.0395	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0315	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0346	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0388	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0752	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0137	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0230	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroundecanoic acid		0.00089 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0025	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0019	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0531	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0023	0.0018	0.00089	ug/l	EPA 537M BY ID
PFOSA [b]		0.0065	0.0036	0.0018	ug/l	EPA 537M BY ID
MeFOSAA		0.0043	0.0036	0.0018	ug/l	EPA 537M BY ID
EtFOSAA		0.0072	0.0036	0.0018	ug/l	EPA 537M BY ID
FA81366-7	**P6-SB-07_120220**					
Perfluorobutanoic acid		0.391	0.036	0.018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		1.58	0.018	0.0089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		1.46	0.018	0.0089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		1.24	0.018	0.0089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		1.78	0.018	0.0089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.197	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0532	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0063	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0033	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0050	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.00096 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.126	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81366-8	**DUP-02_120220**					
Perfluorobutanoic acid [c]		0.0280	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0318	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0330	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0338	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0745	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0141	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0207	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0035	0.0018	0.00089	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81366
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/02/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorohexanesulfonic acid		0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.00091 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0484	0.0018	0.00089	ug/l	EPA 537M BY ID
PFOSA [c]		0.0066	0.0036	0.0018	ug/l	EPA 537M BY ID
MeFOSAA		0.0038	0.0036	0.0018	ug/l	EPA 537M BY ID
EtFOSAA		0.0056	0.0036	0.0018	ug/l	EPA 537M BY ID

(a) Associated ID Standard outside control limits, Confirmed by re-analysis.
(b) Associated ID Standard outside control limits due to matrix interference.
(c) Associated ID Standard outside control limits. Hits confirmed by re-extraction and reanalysis.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	EB-01_120220		
Lab Sample ID:	FA81366-1	**Date Sampled:**	12/02/20
Matrix:	AQ - Equipment Blank	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59367.D	1	12/08/20 21:00	NAF	12/05/20 08:30	OP83270	S2Q871
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-01_120220		
Lab Sample ID:	FA81366-1	**Date Sampled:**	12/02/20
Matrix:	AQ - Equipment Blank	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	94%		35-135%
	13C5-PFPeA	93%		50-150%
	13C5-PFHxA	93%		50-150%
	13C4-PFHpA	92%		50-150%
	13C8-PFOA	96%		50-150%
	13C9-PFNA	95%		50-150%
	13C6-PFDA	100%		50-150%
	13C7-PFUnDA	96%		40-140%
	13C2-PFDoDA	89%		40-140%
	13C2-PFTeDA	73%		30-130%
	13C3-PFBS	95%		50-150%
	13C3-PFHxS	97%		50-150%
	13C8-PFOS	101%		50-150%
	13C8-FOSA	88%		30-130%
	d3-MeFOSAA	106%		50-150%
	d5-EtFOSAA	97%		50-150%
	13C2-4:2FTS	90%		50-150%
	13C2-6:2FTS	94%		50-150%
	13C2-8:2FTS	97%		50-150%
	13C3-HFPO-DA	98%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-12_120220		
Lab Sample ID:	FA81366-2	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59368.D	1	12/08/20 21:15	NAF	12/05/20 08:30	OP83270	S2Q871
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0447	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0723	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0956	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0556	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0912	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0098	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0169	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid [a]	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid [a]	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0011	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0019	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0660	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA [a]	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-12_120220		
Lab Sample ID:	FA81366-2	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%		35-135%
	13C5-PFPeA	62%		50-150%
	13C5-PFHxA	58%		50-150%
	13C4-PFHpA	54%		50-150%
	13C8-PFOA	58%		50-150%
	13C9-PFNA	62%		50-150%
	13C6-PFDA	64%		50-150%
	13C7-PFUnDA	54%		40-140%
	13C2-PFDoDA	41%		40-140%
	13C2-PFTeDA	8% [b]		30-130%
	13C3-PFBS	68%		50-150%
	13C3-PFHxS	62%		50-150%
	13C8-PFOS	70%		50-150%
	13C8-FOSA	13% [b]		30-130%
	d3-MeFOSAA	59%		50-150%
	d5-EtFOSAA	57%		50-150%
	13C2-4:2FTS	61%		50-150%
	13C2-6:2FTS	64%		50-150%
	13C2-8:2FTS	71%		50-150%
	13C3-HFPO-DA	64%		50-150%

(a) Associated ID Standard outside control limits, Confirmed by batch QC.
(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-70_120220		
Lab Sample ID:	FA81366-3	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59370.D	1	12/08/20 21:44	NAF	12/05/20 08:30	OP83270	S2Q871
Run #2	3Q31058.D	2	12/09/20 15:44	MRE	12/05/20 08:30	OP83270	S3Q458

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.116	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.426 [a]	0.0036	0.0018	ug/l	
307-24-4	Perfluorohexanoic acid	0.279	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.107	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0074	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0037	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0012	0.0018	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-70_120220		
Lab Sample ID:	FA81366-3	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	77%	80%	35-135%
	13C5-PFPeA	76%	79%	50-150%
	13C5-PFHxA	75%	78%	50-150%
	13C4-PFHpA	71%	80%	50-150%
	13C8-PFOA	81%	86%	50-150%
	13C9-PFNA	91%	89%	50-150%
	13C6-PFDA	98%	90%	50-150%
	13C7-PFUnDA	93%	88%	40-140%
	13C2-PFDoDA	89%	82%	40-140%
	13C2-PFTeDA	82%	87%	30-130%
	13C3-PFBS	84%	84%	50-150%
	13C3-PFHxS	78%	82%	50-150%
	13C8-PFOS	96%	91%	50-150%
	13C8-FOSA	80%	87%	30-130%
	d3-MeFOSAA	107%	87%	50-150%
	d5-EtFOSAA	102%	85%	50-150%
	13C2-4:2FTS	79%	72%	50-150%
	13C2-6:2FTS	89%	82%	50-150%
	13C2-8:2FTS	98%	83%	50-150%
	13C3-HFPO-DA	84%	72%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-13_120220		
Lab Sample ID:	FA81366-4	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59373.D	1	12/08/20 22:28	NAF	12/05/20 08:30	OP83270	S2Q871
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0326	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0419	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0616	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0156	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0019	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-13_120220		
Lab Sample ID:	FA81366-4	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	76%		50-150%
	13C5-PFHxA	74%		50-150%
	13C4-PFHpA	69%		50-150%
	13C8-PFOA	78%		50-150%
	13C9-PFNA	87%		50-150%
	13C6-PFDA	97%		50-150%
	13C7-PFUnDA	93%		40-140%
	13C2-PFDoDA	88%		40-140%
	13C2-PFTeDA	85%		30-130%
	13C3-PFBS	82%		50-150%
	13C3-PFHxS	72%		50-150%
	13C8-PFOS	92%		50-150%
	13C8-FOSA	71%		30-130%
	d3-MeFOSAA	108%		50-150%
	d5-EtFOSAA	103%		50-150%
	13C2-4:2FTS	77%		50-150%
	13C2-6:2FTS	85%		50-150%
	13C2-8:2FTS	99%		50-150%
	13C3-HFPO-DA	84%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-67_120220		
Lab Sample ID:	FA81366-5	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59374.D	1	12/08/20 22:43	NAF	12/05/20 08:30	OP83270	S2Q871
Run #2	3Q31059.D	5	12/09/20 16:00	MRE	12/05/20 08:30	OP83270	S3Q458

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0592	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0768	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0984	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0422	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0271	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0015	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0036	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0011	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0078	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA [a]	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-67_120220		
Lab Sample ID:	FA81366-5	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%	81%	35-135%
	13C5-PFPeA	60%	81%	50-150%
	13C5-PFHxA	59%	78%	50-150%
	13C4-PFHpA	60%	80%	50-150%
	13C8-PFOA	65%	86%	50-150%
	13C9-PFNA	72%	88%	50-150%
	13C6-PFDA	82%	91%	50-150%
	13C7-PFUnDA	82%	90%	40-140%
	13C2-PFDoDA	76%	85%	40-140%
	13C2-PFTeDA	54%	75%	30-130%
	13C3-PFBS	70%	82%	50-150%
	13C3-PFHxS	69%	85%	50-150%
	13C8-PFOS	79%	87%	50-150%
	13C8-FOSA	25% [b]	48%	30-130%
	d3-MeFOSAA	99%	91%	50-150%
	d5-EtFOSAA	96%	88%	50-150%
	13C2-4:2FTS	61%	74%	50-150%
	13C2-6:2FTS	73%	80%	50-150%
	13C2-8:2FTS	90%	85%	50-150%
	13C3-HFPO-DA	69%	72%	50-150%

(a) Associated ID Standard outside control limits due to matrix interference.
(b) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-13-36R_120220		
Lab Sample ID:	FA81366-6	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59375.D	1	12/08/20 22:58	NAF	12/05/20 08:30	OP83270	S2Q871
Run #2	3Q31060.D	5	12/09/20 16:16	MRE	12/05/20 08:30	OP83270	S3Q458

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid [a]	0.0395	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0315	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0346	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0388	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0752	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0137	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0230	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.00089	0.0018	0.00089	ug/l	J
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0025	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0019	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0531	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0023	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA [b]	0.0065	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	0.0043	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	0.0072	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-13-36R_120220		
Lab Sample ID:	FA81366-6	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	20% [c]	23% [c]	35-135%
	13C5-PFPeA	71%	88%	50-150%
	13C5-PFHxA	65%	81%	50-150%
	13C4-PFHpA	59%	80%	50-150%
	13C8-PFOA	63%	83%	50-150%
	13C9-PFNA	66%	82%	50-150%
	13C6-PFDA	70%	81%	50-150%
	13C7-PFUnDA	67%	79%	40-140%
	13C2-PFDoDA	63%	74%	40-140%
	13C2-PFTeDA	59%	71%	30-130%
	13C3-PFBS	76%	87%	50-150%
	13C3-PFHxS	69%	84%	50-150%
	13C8-PFOS	76%	87%	50-150%
	13C8-FOSA	20% [c]	40%	30-130%
	d3-MeFOSAA	69%	94%	50-150%
	d5-EtFOSAA	71%	100%	50-150%
	13C2-4:2FTS	67%	78%	50-150%
	13C2-6:2FTS	69%	80%	50-150%
	13C2-8:2FTS	78%	85%	50-150%
	13C3-HFPO-DA	74%	75%	50-150%

(a) Associated ID Standard outside control limits, Confirmed by re-analysis.
(b) Associated ID Standard outside control limits due to matrix interference.
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-SB-07_120220		
Lab Sample ID:	FA81366-7	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59376.D	1	12/08/20 23:13	NAF	12/05/20 08:30	OP83270	S2Q871
Run #2	3Q31061.D	10	12/09/20 16:32	MRE	12/05/20 08:30	OP83270	S3Q458

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.391 [a]	0.036	0.018	ug/l	
2706-90-3	Perfluoropentanoic acid	1.58 [a]	0.018	0.0089	ug/l	
307-24-4	Perfluorohexanoic acid	1.46 [a]	0.018	0.0089	ug/l	
375-85-9	Perfluoroheptanoic acid	1.24 [a]	0.018	0.0089	ug/l	
335-67-1	Perfluorooctanoic acid	1.78 [a]	0.018	0.0089	ug/l	
375-95-1	Perfluorononanoic acid	0.197	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0532	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0063	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0033	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0050	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.00096	0.0018	0.00089	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.126	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA [b]	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P6-SB-07_120220		
Lab Sample ID:	FA81366-7	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	68%	93%	35-135%
	13C5-PFPeA	67%	92%	50-150%
	13C5-PFHxA	62%	87%	50-150%
	13C4-PFHpA	59%	87%	50-150%
	13C8-PFOA	60%	88%	50-150%
	13C9-PFNA	68%	89%	50-150%
	13C6-PFDA	73%	90%	50-150%
	13C7-PFUnDA	70%	90%	40-140%
	13C2-PFDoDA	75%	84%	40-140%
	13C2-PFTeDA	66%	84%	30-130%
	13C3-PFBS	76%	93%	50-150%
	13C3-PFHxS	72%	96%	50-150%
	13C8-PFOS	76%	89%	50-150%
	13C8-FOSA	19% [c]	55%	30-130%
	d3-MeFOSAA	78%	92%	50-150%
	d5-EtFOSAA	78%	91%	50-150%
	13C2-4:2FTS	68%	83%	50-150%
	13C2-6:2FTS	64%	87%	50-150%
	13C2-8:2FTS	82%	85%	50-150%
	13C3-HFPO-DA	74%	83%	50-150%

(a) Result is from Run# 2
(b) Associated ID Standard outside control limits due to matrix interference.
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-02_120220		
Lab Sample ID:	FA81366-8	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9327.D	1	12/17/20 19:55	MV	12/16/20 08:30	OP83404	S4Q128
Run #2 [a]	2Q59377.D	1.1	12/08/20 23:28	NAF	12/05/20 08:30	OP83270	S2Q871

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid [b]	0.0280	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0318	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0330	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0338	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0745	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0141	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0207	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid [b]	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid [b]	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0035	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.00091	0.0018	0.00089	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0484	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA [b]	0.0066	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	0.0038	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	0.0056	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-02_120220		
Lab Sample ID:	FA81366-8	**Date Sampled:**	12/02/20
Matrix:	AQ - Ground Water	**Date Received:**	12/03/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	20% [c]	72%	35-135%
	13C5-PFPeA	64%	71%	50-150%
	13C5-PFHxA	60%	67%	50-150%
	13C4-PFHpA	63%	63%	50-150%
	13C8-PFOA	67%	67%	50-150%
	13C9-PFNA	70%	66%	50-150%
	13C6-PFDA	74%	64%	50-150%
	13C7-PFUnDA	67%	44%	40-140%
	13C2-PFDoDA	50%	20% [c]	40-140%
	13C2-PFTeDA	25% [c]	2% [c]	30-130%
	13C3-PFBS	62%	79%	50-150%
	13C3-PFHxS	73%	73%	50-150%
	13C8-PFOS	73%	70%	50-150%
	13C8-FOSA	25% [c]	3% [c]	30-130%
	d3-MeFOSAA	62%	44% [c]	50-150%
	d5-EtFOSAA	67%	37% [c]	50-150%
	13C2-4:2FTS	68%	70%	50-150%
	13C2-6:2FTS	77%	74%	50-150%
	13C2-8:2FTS	88%	71%	50-150%
	13C3-HFPO-DA	59%	77%	50-150%

(a) Confirmation run.
(b) Associated ID Standard outside control limits. Hits confirmed by re-extraction and reanalysis.
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL: 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS PLANT-6

FA81366

SGS - ORLANDO JOB # : PAGE 1 OF 1

SGS - ORLANDO Quote #	SKIFF #

Client / Reporting Information

Company Name: ARCADIS
Address: 28550 CABOT DR, SUITE 500
City: NOVI State: MI Zip: 48377
Project Contact: TIFFANY.LINDER@ARCADIS.COM Email:
Phone #: 810-225-1928
Sampler(s) Name(s) (Printed)
Sampler 1: BRIAN J. COSTA Sampler 2:

Project Information

Project Name: RACER LANSING
Street: 2800 W. SAGINAW HWY
City: LANSING State: MI
Project #: 30042872.037700
Fax #:
Client Purchase Order #

Analytical Information

PFAS via Method 537 Mod (Isotope Dilution List)

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NAOH+ZNAC	DI WATER	MEOH	LAB USE ONLY
1	EB-01_120220	12/2/20	9:15	BJC	WW	2		X								
2	MW-12-12_120220	12/2/20	10:15	BJC	GW	2		X								
3	MW-14-70_120220	12/2/20	11:20	BJC	GW	2		X								
4	MW-12-13_120220	12/2/20	12:10	BJC	GW	2		X								
3R 12.2.20	~~PG-SB-37_120220~~	~~12/2/20~~	~~13:40~~	~~BJC~~	~~GW~~	~~2~~		~~X~~								
5	MW-14-67_120220	12/2/20	13:10	BJC	GW	2		X								
6	MW-13-36R_120220	12/2/20	13:55	BJC	GW	2		X								
7	PG-SB-07_120220	12/2/20	15:00	BJC	GW	2		X								
8	DUP-02_120220	12/2/20	—	BJC	GW	2		X								

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- ☐ COMMERCIAL "A" (RESULTS ONLY)
- ☐ COMMERCIAL "B" (RESULTS PLUS QC)
- ☐ REDT1 (EPA LEVEL 3)
- ☐ FULLT1 (EPA LEVEL 4)
- ☐ EDD'S

Comments / Remarks

* REPORT EGLE 28 COMPOUNDS
* PG-SB-37 (NO SAMPLE)
INITIAL ASSESSMENT MK
INITIAL RE-EVALUATION DO

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1	ARCADIS	12/2/20 1600	2 Arcadis	3 HX		4 12/3/20 1030
5	Relinquished by/Affiliation	Date Time:	6 Received By/Affiliation	7 Relinquished By/Affiliation	Date Time:	8 Received By/Affiliation

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 3.4

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA81366: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA81366 **Client:** ARCADIS **Project:** RACER LANSINE

Date / Time Received: 12/3/2020 10:30:00 AM **Delivery Method:** FX **Airbill #'s:** 9231 5382 1517

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.2);

Cooler Temps (Corrected) °C: Cooler 1: (3.4);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: PETERH Date: 12/3/2020 10:30:00 A Reviewer: _____ Date: _____

FA81366: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Instrument Blank

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q128-IBLK	4Q9303.D	1	12/17/20	MV	n/a	n/a	S4Q128

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	96%	50-150%
	13C9-PFNA	101%	50-150%
	13C8-PFOS	96%	50-150%

Method Blank Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MB	2Q59362.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-1, FA81366-2, FA81366-3, FA81366-4, FA81366-5, FA81366-6, FA81366-7

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	91%	35-135%
	13C5-PFPeA	89%	50-150%
	13C5-PFHxA	90%	50-150%
	13C4-PFHpA	90%	50-150%

Method Blank Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MB	2Q59362.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-1, FA81366-2, FA81366-3, FA81366-4, FA81366-5, FA81366-6, FA81366-7

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	92%	50-150%
	13C9-PFNA	94%	50-150%
	13C6-PFDA	95%	50-150%
	13C7-PFUnDA	89%	40-140%
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	79%	30-130%
	13C3-PFBS	91%	50-150%
	13C3-PFHxS	90%	50-150%
	13C8-PFOS	96%	50-150%
	13C8-FOSA	80%	30-130%
	d3-MeFOSAA	104%	50-150%
	d5-EtFOSAA	97%	50-150%
	13C2-4:2FTS	89%	50-150%
	13C2-6:2FTS	92%	50-150%
	13C2-8:2FTS	93%	50-150%
	13C3-HFPO-DA	96%	50-150%

Method Blank Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83404-MB	4Q9322.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	71%	35-135%
	13C5-PFPeA	77%	50-150%
	13C5-PFHxA	77%	50-150%
	13C4-PFHpA	78%	50-150%

Method Blank Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83404-MB	4Q9322.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-8

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	78%	50-150%
	13C9-PFNA	82%	50-150%
	13C6-PFDA	84%	50-150%
	13C7-PFUnDA	79%	40-140%
	13C2-PFDoDA	76%	40-140%
	13C2-PFTeDA	77%	30-130%
	13C3-PFBS	77%	50-150%
	13C3-PFHxS	77%	50-150%
	13C8-PFOS	75%	50-150%
	13C8-FOSA	95%	30-130%
	d3-MeFOSAA	89%	50-150%
	d5-EtFOSAA	83%	50-150%
	13C2-4:2FTS	77%	50-150%
	13C2-6:2FTS	83%	50-150%
	13C2-8:2FTS	85%	50-150%

Instrument Blank

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q871-IBLK	2Q59334.D	1	12/08/20	NAF	n/a	n/a	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81366-1, FA81366-2, FA81366-3, FA81366-4, FA81366-5, FA81366-6, FA81366-7

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	97%	50-150%
	13C4-PFHpA	99%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	102%	50-150%

Instrument Blank

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q871-IBLK	2Q59334.D	1	12/08/20	NAF	n/a	n/a	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81366-1, FA81366-2, FA81366-3, FA81366-4, FA81366-5, FA81366-6, FA81366-7

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	103%	50-150%
	13C7-PFUnDA	102%	50-150%
	13C2-PFDoDA	102%	50-150%
	13C2-PFTeDA	104%	50-150%
	13C3-PFBS	99%	50-150%
	13C3-PFHxS	98%	50-150%
	13C8-PFOS	106%	50-150%
	d3-MeFOSAA	114%	50-150%
	d5-EtFOSAA	115%	50-150%

Instrument Blank

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q458-IBLK	3Q31053.D	1	12/09/20	MRE	n/a	n/a	S3Q458

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81366-3, FA81366-5, FA81366-6, FA81366-7

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.016	0.0040	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0080	0.0020	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0080	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0080	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	100%	50-150%
	13C5-PFPeA	98%	50-150%
	13C5-PFHxA	98%	50-150%
	13C4-PFHpA	98%	50-150%
	13C8-PFOA	99%	50-150%
	13C9-PFNA	98%	50-150%
	13C6-PFDA	99%	50-150%
	13C7-PFUnDA	101%	50-150%
	13C2-PFDoDA	100%	50-150%
	13C2-PFTeDA	107%	50-150%
	13C3-PFBS	100%	50-150%
	13C3-PFHxS	99%	50-150%
	13C8-PFOS	99%	50-150%
	13C8-FOSA	103%	50-150%
	d3-MeFOSAA	96%	50-150%
	d5-EtFOSAA	99%	50-150%
	13C2-4:2FTS	90%	50-150%
	13C2-6:2FTS	90%	50-150%
	13C2-8:2FTS	91%	50-150%
	13C3-HFPO-DA	94%	50-150%

Blank Spike Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-BS	2Q59361.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-1, FA81366-2, FA81366-3, FA81366-4, FA81366-5, FA81366-6, FA81366-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0762	95	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0822	103	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0808	101	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0903	113	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0792	99	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0769	96	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0806	101	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0794	99	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0771	96	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0794	99	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0760	95	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0786	98	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0755	94	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0731	91	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0861	108	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0791	99	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0757	95	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0757	95	60-130
754-91-6	PFOSA	0.08	0.0800	100	70-130
2355-31-9	MeFOSAA	0.08	0.0795	99	70-130
2991-50-6	EtFOSAA	0.08	0.0764	96	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0818	102	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0851	106	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0817	102	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0771	96	60-140
919005-14-4	ADONA	0.08	0.0753	94	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0754	94	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0773	97	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	87%	35-135%
	13C5-PFPeA	86%	50-150%
	13C5-PFHxA	86%	50-150%
	13C4-PFHpA	86%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-BS	2Q59361.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-1, FA81366-2, FA81366-3, FA81366-4, FA81366-5, FA81366-6, FA81366-7

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	89%	50-150%
	13C9-PFNA	90%	50-150%
	13C6-PFDA	91%	50-150%
	13C7-PFUnDA	85%	40-140%
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	82%	30-130%
	13C3-PFBS	89%	50-150%
	13C3-PFHxS	87%	50-150%
	13C8-PFOS	93%	50-150%
	13C8-FOSA	74%	30-130%
	d3-MeFOSAA	98%	50-150%
	d5-EtFOSAA	94%	50-150%
	13C2-4:2FTS	90%	50-150%
	13C2-6:2FTS	92%	50-150%
	13C2-8:2FTS	95%	50-150%
	13C3-HFPO-DA	93%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83404-BS	4Q9321.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0837	105	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0792	99	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0787	98	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0784	98	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0794	99	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0770	96	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0796	100	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0796	100	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0810	101	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0936	117	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0819	102	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0802	100	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0768	96	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0778	97	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0834	104	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0806	101	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0803	100	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0713	89	60-130
754-91-6	PFOSA	0.08	0.0774	97	70-130
2355-31-9	MeFOSAA	0.08	0.0785	98	70-130
2991-50-6	EtFOSAA	0.08	0.0830	104	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0785	98	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0777	97	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0783	98	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0786	98	60-140
919005-14-4	ADONA	0.08	0.0755	94	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0707	88	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0765	96	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	76%	35-135%
	13C5-PFPeA	81%	50-150%
	13C5-PFHxA	82%	50-150%
	13C4-PFHpA	84%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83404-BS	4Q9321.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-8

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	83%	50-150%
	13C9-PFNA	87%	50-150%
	13C6-PFDA	87%	50-150%
	13C7-PFUnDA	83%	40-140%
	13C2-PFDoDA	78%	40-140%
	13C2-PFTeDA	64%	30-130%
	13C3-PFBS	82%	50-150%
	13C3-PFHxS	82%	50-150%
	13C8-PFOS	82%	50-150%
	13C8-FOSA	92%	30-130%
	d3-MeFOSAA	89%	50-150%
	d5-EtFOSAA	85%	50-150%
	13C2-4:2FTS	88%	50-150%
	13C2-6:2FTS	93%	50-150%
	13C2-8:2FTS	94%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MS	3Q31069.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31067.D	1	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31068.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-1, FA81366-2, FA81366-3, FA81366-4, FA81366-5, FA81366-6, FA81366-7

CAS No.	Compound	FA81389-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0027	J	0.0714	0.0719	97	70-130
2706-90-3	Perfluoropentanoic acid	0.0021		0.0714	0.0702	95	70-130
307-24-4	Perfluorohexanoic acid	0.0023		0.0714	0.0742	101	70-130
375-85-9	Perfluoroheptanoic acid	0.0021		0.0714	0.0788	107	70-130
335-67-1	Perfluorooctanoic acid	0.0072		0.0714	0.0797	102	70-130
375-95-1	Perfluorononanoic acid	0.0013	J	0.0714	0.0694	95	70-130
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0708	99	70-130
2058-94-8	Perfluoroundecanoic acid	ND [b]		0.0714	0.0663	93	70-130
307-55-1	Perfluorododecanoic acid	ND [b]		0.0714	0.0647	91	70-130
72629-94-8	Perfluorotridecanoic acid	ND [b]		0.0714	0.113	158*	65-130
376-06-7	Perfluorotetradecanoic acid	ND [b]		0.0714	0.0507	71	70-130
375-73-5	Perfluorobutanesulfonic acid	ND		0.0714	0.0702	98	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0686	96	70-130
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0657	92	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.101	141*	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0035		0.0714	0.0740	99	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0268	38*	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0316	44*	60-130
754-91-6	PFOSA	ND [b]		0.0714	0.0577	81	70-130
2355-31-9	MeFOSAA	ND [b]		0.0714	0.0748	105	70-130
2991-50-6	EtFOSAA	ND [b]		0.0714	0.0828	116	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0714	0.0699	98	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0746	104	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0721	101	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0721	101	60-140
919005-14-4	ADONA	ND		0.0714	0.0703	98	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0748	105	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND [b]		0.0714	0.116	162*	60-140

CAS No.	ID Standard Recoveries	MS	FA81389-1	FA81389-1	Limits
	13C4-PFBA	88%	77%	99%	35-135%
	13C5-PFPeA	88%	79%	98%	50-150%
	13C5-PFHxA	87%	78%	97%	50-150%
	13C4-PFHpA	86%	78%	98%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-MS	3Q31069.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31067.D	1	12/09/20	MRE	12/05/20	OP83270	S3Q458
FA81389-1 [a]	3Q31068.D	5	12/09/20	MRE	12/05/20	OP83270	S3Q458

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-1, FA81366-2, FA81366-3, FA81366-4, FA81366-5, FA81366-6, FA81366-7

CAS No.	ID Standard Recoveries	MS	FA81389-1	FA81389-1	Limits
	13C8-PFOA	86%	80%	99%	50-150%
	13C9-PFNA	72%	73%	92%	50-150%
	13C6-PFDA	42%* [c]	56%	77%	50-150%
	13C7-PFUnDA	13%* [c]	28%* [d]	50%	40-140%
	13C2-PFDoDA	4%* [c]	7%* [d]	23%* [d]	40-140%
	13C2-PFTeDA	1%* [c]	0%* [d]	3%* [d]	30-130%
	13C3-PFBS	88%	80%	101%	50-150%
	13C3-PFHxS	86%	81%	97%	50-150%
	13C8-PFOS	59%	67%	87%	50-150%
	13C8-FOSA	2%* [c]	4%* [d]	6%* [d]	30-130%
	d3-MeFOSAA	12%* [c]	30%* [d]	48%* [d]	50-150%
	d5-EtFOSAA	7%* [c]	21%* [d]	40%* [d]	50-150%
	13C2-4:2FTS	85%	73%	92%	50-150%
	13C2-6:2FTS	82%	75%	92%	50-150%
	13C2-8:2FTS	45%* [c]	56%	74%	50-150%
	13C3-HFPO-DA	76%	69%	84%	50-150%

(a) Insufficient sample for re-extraction.
(b) Result is from Run #2.
(c) Outside control limits.
(d) Outside control limits due to matrix interference. Confirmed by MS/MSD.

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83404-MS	4Q9324.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128
DA30936-1	4Q9323.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-8

CAS No.	Compound	DA30936-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	ND		0.0714	0.0713	100	70-130
2706-90-3	Perfluoropentanoic acid	0.0011	J	0.0714	0.0701	97	70-130
307-24-4	Perfluorohexanoic acid	ND		0.0714	0.0691	97	70-130
375-85-9	Perfluoroheptanoic acid	ND		0.0714	0.0696	97	70-130
335-67-1	Perfluorooctanoic acid	0.0016	J	0.0714	0.0722	99	70-130
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0678	95	70-130
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0704	99	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0711	100	70-130
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0709	99	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0821	115	65-130
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0727	102	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0011	J	0.0714	0.0725	100	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0718	101	70-130
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0707	99	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0763	107	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0017	J	0.0714	0.0740	101	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0724	101	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0629	88	60-130
754-91-6	PFOSA	ND		0.0714	0.0707	99	70-130
2355-31-9	MeFOSAA	ND		0.0714	0.0694	97	70-130
2991-50-6	EtFOSAA	ND		0.0714	0.0744	104	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0714	0.0683	96	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0691	97	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0690	97	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0687	96	60-140
919005-14-4	ADONA	ND		0.0714	0.0668	94	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0618	87	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		0.0714	0.0665	93	60-140

CAS No.	ID Standard Recoveries	MS	DA30936-1	Limits
	13C4-PFBA	88%	81%	35-135%
	13C5-PFPeA	89%	81%	50-150%
	13C5-PFHxA	93%	83%	50-150%
	13C4-PFHpA	96%	87%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83404-MS	4Q9324.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128
DA30936-1	4Q9323.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-8

CAS No.	ID Standard Recoveries	MS	DA30936-1	Limits
	13C8-PFOA	96%	88%	50-150%
	13C9-PFNA	101%	92%	50-150%
	13C6-PFDA	102%	94%	50-150%
	13C7-PFUnDA	97%	89%	40-140%
	13C2-PFDoDA	92%	79%	40-140%
	13C2-PFTeDA	77%	50%	30-130%
	13C3-PFBS	89%	81%	50-150%
	13C3-PFHxS	92%	85%	50-150%
	13C8-PFOS	93%	86%	50-150%
	13C8-FOSA	101%	91%	30-130%
	d3-MeFOSAA	106%	99%	50-150%
	d5-EtFOSAA	100%	91%	50-150%
	13C2-4:2FTS	100%	85%	50-150%
	13C2-6:2FTS	109%	93%	50-150%
	13C2-8:2FTS	112%	97%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-DUP	2Q59369.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871
FA81366-2	2Q59368.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-1, FA81366-2, FA81366-3, FA81366-4, FA81366-5, FA81366-6, FA81366-7

CAS No.	Compound	FA81366-2 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.0447		0.0440		2	30
2706-90-3	Perfluoropentanoic acid	0.0723		0.0718		1	30
307-24-4	Perfluorohexanoic acid	0.0956		0.0898		6	30
375-85-9	Perfluoroheptanoic acid	0.0556		0.0539		3	30
335-67-1	Perfluorooctanoic acid	0.0912		0.0886		3	30
375-95-1	Perfluorononanoic acid	0.0098		0.0096		2	30
335-76-2	Perfluorodecanoic acid	0.0169		0.0174		3	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0011	J	ND		200*	30
2706-91-4	Perfluoropentanesulfonic acid	ND		ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	0.0019		0.0012	J	45*	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0660		0.0650		2	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA81366-2	Limits
	13C4-PFBA	70%	63%	35-135%
	13C5-PFPeA	68%	62%	50-150%
	13C5-PFHxA	64%	58%	50-150%
	13C4-PFHpA	59%	54%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83270-DUP	2Q59369.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871
FA81366-2	2Q59368.D	1	12/08/20	NAF	12/05/20	OP83270	S2Q871

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-1, FA81366-2, FA81366-3, FA81366-4, FA81366-5, FA81366-6, FA81366-7

CAS No.	ID Standard Recoveries	DUP	FA81366-2	Limits
	13C8-PFOA	63%	58%	50-150%
	13C9-PFNA	68%	62%	50-150%
	13C6-PFDA	69%	64%	50-150%
	13C7-PFUnDA	61%	54%	40-140%
	13C2-PFDoDA	51%	41%	40-140%
	13C2-PFTeDA	13%* [a]	8%* [a]	30-130%
	13C3-PFBS	75%	68%	50-150%
	13C3-PFHxS	70%	62%	50-150%
	13C8-PFOS	76%	70%	50-150%
	13C8-FOSA	13%* [a]	13%* [a]	30-130%
	d3-MeFOSAA	65%	59%	50-150%
	d5-EtFOSAA	63%	57%	50-150%
	13C2-4:2FTS	67%	61%	50-150%
	13C2-6:2FTS	70%	64%	50-150%
	13C2-8:2FTS	79%	71%	50-150%
	13C3-HFPO-DA	71%	64%	50-150%

(a) Outside control limits.

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83404-DUP	4Q9326.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128
DA30937-1	4Q9325.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-8

CAS No.	Compound	DA30937-1 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.0074		0.0073		1	30
2706-90-3	Perfluoropentanoic acid	0.0152		0.0154		1	30
307-24-4	Perfluorohexanoic acid	0.0135		0.0135		0	30
375-85-9	Perfluoroheptanoic acid	0.0083		0.0084		1	30
335-67-1	Perfluorooctanoic acid	0.0184		0.0187		2	30
375-95-1	Perfluorononanoic acid	0.0017	J	0.0017	J	0	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0105		0.0105		0	30
2706-91-4	Perfluoropentanesulfonic acid	ND		ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	0.0037		0.0038		3	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0095		0.0098		3	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	DA30937-1	Limits
	13C4-PFBA	54%	60%	35-135%
	13C5-PFPeA	67%	74%	50-150%
	13C5-PFHxA	72%	79%	50-150%
	13C4-PFHpA	76%	84%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81366
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83404-DUP	4Q9326.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128
DA30937-1	4Q9325.D	1	12/17/20	MV	12/16/20	OP83404	S4Q128

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81366-8

CAS No.	ID Standard Recoveries	DUP	DA30937-1	Limits
	13C8-PFOA	78%	87%	50-150%
	13C9-PFNA	83%	92%	50-150%
	13C6-PFDA	84%	94%	50-150%
	13C7-PFUnDA	77%	86%	40-140%
	13C2-PFDoDA	70%	81%	40-140%
	13C2-PFTeDA	55%	61%	30-130%
	13C3-PFBS	67%	74%	50-150%
	13C3-PFHxS	75%	82%	50-150%
	13C8-PFOS	77%	87%	50-150%
	13C8-FOSA	63%	73%	30-130%
	d3-MeFOSAA	92%	105%	50-150%
	d5-EtFOSAA	83%	100%	50-150%
	13C2-4:2FTS	75%	82%	50-150%
	13C2-6:2FTS	86%	98%	50-150%
	13C2-8:2FTS	90%	100%	50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA81477

Sampling Dates: 12/03/20 - 12/04/20

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Total number of pages in report: 45

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

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Technical Director

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA81477

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
This report contains results reported as ND = Not detected. The following applies: Organics ND = Not detected above the MDL							
FA81477-1	12/03/20	09:55	JPAW	12/07/20	AQ	Ground Water	MW-15-72_120320
FA81477-2	12/03/20	11:30	JPAW	12/07/20	AQ	Ground Water	MW-16-81_120320
FA81477-3	12/03/20	13:20	JPAW	12/07/20	AQ	Ground Water	MW-14-56_120320
FA81477-4	12/03/20	14:45	JPAW	12/07/20	AQ	Ground Water	MW-20-130_120320
FA81477-5	12/04/20	10:10	JPAW	12/07/20	AQ	Ground Water	MW-14-62_120420
FA81477-6	12/04/20	11:05	JPAW	12/07/20	AQ	Ground Water	MW-12-18_120420
FA81477-6D	12/04/20	11:05	JPAW	12/07/20	AQ	Water Dup/MSD	MW-12-18_120420
FA81477-6S	12/04/20	11:05	JPAW	12/07/20	AQ	Water Matrix Spike	MW-12-18_120420
FA81477-7	12/04/20	12:10	JPAW	12/07/20	AQ	Ground Water	MW-14-58_120420
FA81477-8	12/04/20	00:00	JPAW	12/07/20	AQ	Ground Water	DUP-04_120420
FA81477-9	12/04/20	13:15	JPAW	12/07/20	AQ	Ground Water	MW-12-09_120420
FA81477-10	12/04/20	14:00	JPAW	12/07/20	AQ	Ground Water	MW-14-59_120420

Sample Summary
(continued)

Arcadis

Job No: FA81477

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA81477-11	12/04/20	14:55	JPAW	12/07/20	AQ	Ground Water	MW-14-60_120420

2

Summary of Hits

Job Number: FA81477
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/03/20 thru 12/04/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA81477-1	**MW-15-72_120320**					
Perfluoropentanoic acid		0.0033	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0013 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81477-2	**MW-16-81_120320**					
Perfluorobutanoic acid		0.0029 J	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0038	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0021	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81477-3	**MW-14-56_120320**					
Perfluorobutanoic acid		0.0053	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0078	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81477-4	**MW-20-130_120320**					
Perfluorobutanoic acid		0.0043	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0058	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0108	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0019	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81477-5	**MW-14-62_120420**					
Perfluoropentanoic acid		0.0143	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0154	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0166	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0475	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0073	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0020	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0012 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0075	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0029	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0756	0.0018	0.00089	ug/l	EPA 537M BY ID
EtFOSAA		0.0019 J	0.0036	0.0018	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		0.0228	0.0071	0.0018	ug/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		0.0065 J	0.0071	0.0018	ug/l	EPA 537M BY ID
FA81477-6	**MW-12-18_120420**					
Perfluorobutanoic acid		0.0039	0.0036	0.0018	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81477
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/03/20 thru 12/04/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA81477-7	**MW-14-58_120420**					
Perfluorobutanoic acid		0.0071	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0038	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0051	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0024	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0043	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0013 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0013 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81477-8	**DUP-04_120420**					
Perfluorobutanoic acid		0.0072	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0041	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0041	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0028	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0046	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0017 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81477-9	**MW-12-09_120420**					
Perfluorobutanoic acid		0.0066	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0035	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0046	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0047	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0154	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0016 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0035	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81477-10	**MW-14-59_120420**					
Perfluorobutanoic acid		0.0080	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0018	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0032	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0023	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0088	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0017 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81477-11	**MW-14-60_120420**					
Perfluorobutanoic acid		0.0129	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0169	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid [a]		0.0051 J	0.0089	0.0045	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid [a]		0.0365	0.0089	0.0045	ug/l	EPA 537M BY ID
Perfluorooctanoic acid [a]		0.0174	0.0089	0.0045	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81477
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/03/20 thru 12/04/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorodecanoic acid		0.0017 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0033	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid [a]		0.0149	0.0089	0.0045	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0056	0.0018	0.00089	ug/l	EPA 537M BY ID

(a) Dilution required due to matrix interference (ID recovery standard failure).

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-15-72_120320		
Lab Sample ID:	FA81477-1	**Date Sampled:**	12/03/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59487.D	1	12/10/20 18:30	NAF	12/09/20 08:30	OP83320	S2Q873
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0033	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0013	0.0018	0.00089	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate [a]	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-15-72_120320		
Lab Sample ID:	FA81477-1	**Date Sampled:**	12/03/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	87%		35-135%
	13C5-PFPeA	85%		50-150%
	13C5-PFHxA	84%		50-150%
	13C4-PFHpA	82%		50-150%
	13C8-PFOA	89%		50-150%
	13C9-PFNA	97%		50-150%
	13C6-PFDA	99%		50-150%
	13C7-PFUnDA	91%		40-140%
	13C2-PFDoDA	88%		40-140%
	13C2-PFTeDA	74%		30-130%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	85%		50-150%
	13C8-PFOS	100%		50-150%
	13C8-FOSA	41%		30-130%
	d3-MeFOSAA	104%		50-150%
	d5-EtFOSAA	102%		50-150%
	13C2-4:2FTS	84%		50-150%
	13C2-6:2FTS	92%		50-150%
	13C2-8:2FTS	96%		50-150%
	13C3-HFPO-DA	97%		50-150%

(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-16-81_120320		
Lab Sample ID:	FA81477-2	**Date Sampled:**	12/03/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59514.D	1	12/11/20 15:41	MV	12/09/20 08:30	OP83320	S2Q874
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0029	0.0036	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0038	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0021	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-16-81_120320		
Lab Sample ID:	FA81477-2	**Date Sampled:**	12/03/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	55%		35-135%
	13C5-PFPeA	58%		50-150%
	13C5-PFHxA	58%		50-150%
	13C4-PFHpA	58%		50-150%
	13C8-PFOA	62%		50-150%
	13C9-PFNA	65%		50-150%
	13C6-PFDA	71%		50-150%
	13C7-PFUnDA	61%		40-140%
	13C2-PFDoDA	54%		40-140%
	13C2-PFTeDA	51%		30-130%
	13C3-PFBS	65%		50-150%
	13C3-PFHxS	60%		50-150%
	13C8-PFOS	71%		50-150%
	13C8-FOSA	43%		30-130%
	d3-MeFOSAA	79%		50-150%
	d5-EtFOSAA	76%		50-150%
	13C2-4:2FTS	59%		50-150%
	13C2-6:2FTS	64%		50-150%
	13C2-8:2FTS	69%		50-150%
	13C3-HFPO-DA	69%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-56_120320		
Lab Sample ID:	FA81477-3	**Date Sampled:**	12/03/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59516.D	1	12/11/20 16:10	MV	12/09/20 08:30	OP83320	S2Q874
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0053	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0078	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0011	0.0018	0.00089	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-56_120320		
Lab Sample ID:	FA81477-3	**Date Sampled:**	12/03/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	81%		35-135%
	13C5-PFPeA	83%		50-150%
	13C5-PFHxA	82%		50-150%
	13C4-PFHpA	84%		50-150%
	13C8-PFOA	89%		50-150%
	13C9-PFNA	86%		50-150%
	13C6-PFDA	87%		50-150%
	13C7-PFUnDA	81%		40-140%
	13C2-PFDoDA	77%		40-140%
	13C2-PFTeDA	43%		30-130%
	13C3-PFBS	86%		50-150%
	13C3-PFHxS	84%		50-150%
	13C8-PFOS	93%		50-150%
	13C8-FOSA	57%		30-130%
	d3-MeFOSAA	91%		50-150%
	d5-EtFOSAA	89%		50-150%
	13C2-4:2FTS	82%		50-150%
	13C2-6:2FTS	84%		50-150%
	13C2-8:2FTS	81%		50-150%
	13C3-HFPO-DA	96%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-20-130_120320		
Lab Sample ID:	FA81477-4	**Date Sampled:**	12/03/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59490.D	1	12/10/20 19:14	NAF	12/09/20 08:30	OP83320	S2Q873
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0043	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0058	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0108	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0019	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate [a]	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-20-130_120320		
Lab Sample ID:	FA81477-4	**Date Sampled:**	12/03/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	72%		35-135%
	13C5-PFPeA	74%		50-150%
	13C5-PFHxA	74%		50-150%
	13C4-PFHpA	72%		50-150%
	13C8-PFOA	77%		50-150%
	13C9-PFNA	83%		50-150%
	13C6-PFDA	89%		50-150%
	13C7-PFUnDA	83%		40-140%
	13C2-PFDoDA	79%		40-140%
	13C2-PFTeDA	66%		30-130%
	13C3-PFBS	78%		50-150%
	13C3-PFHxS	76%		50-150%
	13C8-PFOS	88%		50-150%
	13C8-FOSA	76%		30-130%
	d3-MeFOSAA	96%		50-150%
	d5-EtFOSAA	96%		50-150%
	13C2-4:2FTS	74%		50-150%
	13C2-6:2FTS	81%		50-150%
	13C2-8:2FTS	86%		50-150%
	13C3-HFPO-DA	83%		50-150%

(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-62_120420		
Lab Sample ID:	FA81477-5	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59518.D	1	12/11/20 16:40	MV	12/09/20 08:30	OP83320	S2Q874
Run #2 [a]	2Q59519.D	5	12/11/20 16:55	MV	12/09/20 08:30	OP83320	S2Q874

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid [b]	ND [c]	0.018	0.0089	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0143	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0154	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0166	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0475	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0073	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0020	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0012	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0075	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0029	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0756	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [c]	0.018	0.0089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	0.0019	0.0036	0.0018	ug/l	J
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0228	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-62_120420		
Lab Sample ID:	FA81477-5	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	0.0065	0.0071	0.0018	ug/l	J
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	7% [d]	7% [d]	35-135%
	13C5-PFPeA	57%	58%	50-150%
	13C5-PFHxA	67%	73%	50-150%
	13C4-PFHpA	60%	68%	50-150%
	13C8-PFOA	60%	68%	50-150%
	13C9-PFNA	60%	68%	50-150%
	13C6-PFDA	63%	68%	50-150%
	13C7-PFUnDA	58%	66%	40-140%
	13C2-PFDoDA	55%	63%	40-140%
	13C2-PFTeDA	63%	64%	30-130%
	13C3-PFBS	77%	77%	50-150%
	13C3-PFHxS	64%	69%	50-150%
	13C8-PFOS	68%	73%	50-150%
	13C8-FOSA	19% [d]	37%	30-130%
	d3-MeFOSAA	66%	87%	50-150%
	d5-EtFOSAA	76%	99%	50-150%
	13C2-4:2FTS	69%	75%	50-150%
	13C2-6:2FTS	66%	73%	50-150%
	13C2-8:2FTS	71%	75%	50-150%
	13C3-HFPO-DA	77%	85%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Associated ID Standard outside control limits, Confirmed by re-analysis.
(c) Result is from Run# 2
(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-18_120420		
Lab Sample ID:	FA81477-6	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59492.D	1	12/10/20 19:43	NAF	12/09/20 08:30	OP83320	S2Q873
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0039	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate [a]	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-18_120420		
Lab Sample ID:	FA81477-6	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	85%		35-135%
	13C5-PFPeA	87%		50-150%
	13C5-PFHxA	85%		50-150%
	13C4-PFHpA	82%		50-150%
	13C8-PFOA	88%		50-150%
	13C9-PFNA	90%		50-150%
	13C6-PFDA	93%		50-150%
	13C7-PFUnDA	89%		40-140%
	13C2-PFDoDA	86%		40-140%
	13C2-PFTeDA	79%		30-130%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	86%		50-150%
	13C8-PFOS	98%		50-150%
	13C8-FOSA	86%		30-130%
	d3-MeFOSAA	101%		50-150%
	d5-EtFOSAA	100%		50-150%
	13C2-4:2FTS	83%		50-150%
	13C2-6:2FTS	89%		50-150%
	13C2-8:2FTS	91%		50-150%
	13C3-HFPO-DA	92%		50-150%

(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-58_120420		
Lab Sample ID:	FA81477-7	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59520.D	1	12/11/20 17:09	MV	12/09/20 08:30	OP83320	S2Q874
Run #2 [a]	2Q59521.D	5	12/11/20 17:24	MV	12/09/20 08:30	OP83320	S2Q874

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0071	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0038	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0051	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0024	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0043	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0013	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0013	0.0018	0.00089	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.018	0.0089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-58_120420		
Lab Sample ID:	FA81477-7	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	66%	83%	35-135%
	13C5-PFPeA	68%	83%	50-150%
	13C5-PFHxA	66%	80%	50-150%
	13C4-PFHpA	64%	73%	50-150%
	13C8-PFOA	68%	80%	50-150%
	13C9-PFNA	73%	78%	50-150%
	13C6-PFDA	78%	83%	50-150%
	13C7-PFUnDA	77%	76%	40-140%
	13C2-PFDoDA	73%	74%	40-140%
	13C2-PFTeDA	45%	64%	30-130%
	13C3-PFBS	74%	83%	50-150%
	13C3-PFHxS	69%	80%	50-150%
	13C8-PFOS	81%	84%	50-150%
	13C8-FOSA	19% [c]	30%	30-130%
	d3-MeFOSAA	95%	95%	50-150%
	d5-EtFOSAA	94%	91%	50-150%
	13C2-4:2FTS	66%	83%	50-150%
	13C2-6:2FTS	72%	82%	50-150%
	13C2-8:2FTS	82%	80%	50-150%
	13C3-HFPO-DA	77%	92%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-04_120420		
Lab Sample ID:	FA81477-8	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59522.D	1	12/11/20 17:39	MV	12/09/20 08:30	OP83320	S2Q874
Run #2 [a]	2Q59523.D	5	12/11/20 17:54	MV	12/09/20 08:30	OP83320	S2Q874

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0072	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0041	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0041	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0028	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0046	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0017	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.018	0.0089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-04_120420		
Lab Sample ID:	FA81477-8	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	61%	73%	35-135%
	13C5-PFPeA	63%	72%	50-150%
	13C5-PFHxA	61%	71%	50-150%
	13C4-PFHpA	57%	68%	50-150%
	13C8-PFOA	62%	70%	50-150%
	13C9-PFNA	66%	68%	50-150%
	13C6-PFDA	72%	69%	50-150%
	13C7-PFUnDA	71%	64%	40-140%
	13C2-PFDoDA	68%	60%	40-140%
	13C2-PFTeDA	43%	55%	30-130%
	13C3-PFBS	68%	75%	50-150%
	13C3-PFHxS	63%	66%	50-150%
	13C8-PFOS	72%	72%	50-150%
	13C8-FOSA	21% [c]	31%	30-130%
	d3-MeFOSAA	90%	76%	50-150%
	d5-EtFOSAA	87%	76%	50-150%
	13C2-4:2FTS	61%	71%	50-150%
	13C2-6:2FTS	66%	73%	50-150%
	13C2-8:2FTS	75%	67%	50-150%
	13C3-HFPO-DA	71%	79%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-09_120420		
Lab Sample ID:	FA81477-9	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59499.D	1	12/10/20 21:27	NAF	12/09/20 08:30	OP83320	S2Q873
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0066	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0035	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0046	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0047	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0154	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0016	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0035	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate [a]	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-12-09_120420		
Lab Sample ID:	FA81477-9	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	85%		35-135%
	13C5-PFPeA	84%		50-150%
	13C5-PFHxA	80%		50-150%
	13C4-PFHpA	75%		50-150%
	13C8-PFOA	79%		50-150%
	13C9-PFNA	82%		50-150%
	13C6-PFDA	87%		50-150%
	13C7-PFUnDA	78%		40-140%
	13C2-PFDoDA	71%		40-140%
	13C2-PFTeDA	40%		30-130%
	13C3-PFBS	85%		50-150%
	13C3-PFHxS	79%		50-150%
	13C8-PFOS	85%		50-150%
	13C8-FOSA	45%		30-130%
	d3-MeFOSAA	94%		50-150%
	d5-EtFOSAA	90%		50-150%
	13C2-4:2FTS	79%		50-150%
	13C2-6:2FTS	80%		50-150%
	13C2-8:2FTS	86%		50-150%
	13C3-HFPO-DA	87%		50-150%

(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-14-59_120420
Lab Sample ID: FA81477-10
Matrix: AQ - Ground Water
Method: EPA 537M BY ID EPA 537 MOD
Project: Racer Lansing PFAS Delineation; Lansing, MI

Date Sampled: 12/04/20
Date Received: 12/07/20
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59526.D	1	12/11/20 18:38	MV	12/09/20 08:30	OP83320	S2Q874
Run #2 [a]	2Q59527.D	5	12/11/20 18:53	MV	12/09/20 08:30	OP83320	S2Q874

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0080	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0018	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0032	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0023	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0088	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0017	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.018	0.0089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-59_120420		
Lab Sample ID:	FA81477-10	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%	84%	35-135%
	13C5-PFPeA	71%	83%	50-150%
	13C5-PFHxA	68%	80%	50-150%
	13C4-PFHpA	63%	73%	50-150%
	13C8-PFOA	67%	75%	50-150%
	13C9-PFNA	69%	79%	50-150%
	13C6-PFDA	73%	83%	50-150%
	13C7-PFUnDA	76%	81%	40-140%
	13C2-PFDoDA	80%	76%	40-140%
	13C2-PFTeDA	78%	72%	30-130%
	13C3-PFBS	77%	83%	50-150%
	13C3-PFHxS	69%	77%	50-150%
	13C8-PFOS	77%	85%	50-150%
	13C8-FOSA	29% [c]	57%	30-130%
	d3-MeFOSAA	100%	101%	50-150%
	d5-EtFOSAA	105%	98%	50-150%
	13C2-4:2FTS	68%	82%	50-150%
	13C2-6:2FTS	72%	77%	50-150%
	13C2-8:2FTS	81%	86%	50-150%
	13C3-HFPO-DA	79%	86%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-60_120420		
Lab Sample ID:	FA81477-11	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59528.D	1	12/11/20 19:08	MV	12/09/20 08:30	OP83320	S2Q874
Run #2 [a]	2Q59529.D	5	12/11/20 19:22	MV	12/09/20 08:30	OP83320	S2Q874

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0129	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0169	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0051 [b]	0.0089	0.0045	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0365 [b]	0.0089	0.0045	ug/l	
335-67-1	Perfluorooctanoic acid	0.0174 [b]	0.0089	0.0045	ug/l	
375-95-1	Perfluorononanoic acid [c]	ND [b]	0.0089	0.0045	ug/l	
335-76-2	Perfluorodecanoic acid	0.0017	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0033	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND [b]	0.0089	0.0045	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0149 [b]	0.0089	0.0045	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0056	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA [c]	ND [b]	0.018	0.0089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND [b]	0.018	0.0089	ug/l	
2991-50-6	EtFOSAA	ND [b]	0.018	0.0089	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND [b]	0.036	0.0089	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND [b]	0.036	0.0089	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14-60_120420		
Lab Sample ID:	FA81477-11	**Date Sampled:**	12/04/20
Matrix:	AQ - Ground Water	**Date Received:**	12/07/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND [b]	0.036	0.0089	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	51%	68%	35-135%
	13C5-PFPeA	50%	66%	50-150%
	13C5-PFHxA	43% [d]	62%	50-150%
	13C4-PFHpA	35% [d]	55%	50-150%
	13C8-PFOA	7% [d]	56%	50-150%
	13C9-PFNA	28% [d]	40% [d]	50-150%
	13C6-PFDA	51%	62%	50-150%
	13C7-PFUnDA	51%	57%	40-140%
	13C2-PFDoDA	52%	57%	40-140%
	13C2-PFTeDA	58%	62%	30-130%
	13C3-PFBS	59%	69%	50-150%
	13C3-PFHxS	47% [d]	61%	50-150%
	13C8-PFOS	54%	54%	50-150%
	13C8-FOSA	9% [d]	21% [d]	30-130%
	d3-MeFOSAA	36% [d]	81%	50-150%
	d5-EtFOSAA	39% [d]	79%	50-150%
	13C2-4:2FTS	43% [d]	62%	50-150%
	13C2-6:2FTS	25% [d]	61%	50-150%
	13C2-8:2FTS	62%	73%	50-150%
	13C3-HFPO-DA	52%	66%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Associated ID Standard outside control limits, Confirmed by re-analysis.
(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA81477
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

FA 81477

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

Plant 2

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SGS - ORLANDO Quote # SKIFF #

Client / Reporting Information

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Tiffany.Linder@arcadis.com Email:
Phone #: 810 225 1928
Sampler(s) Name(s) (Printed)
Sampler 1: Paul Pisarkiewicz Sampler 2:

Project Information

Project Name: Racer Lansing
Street: 2800 W Saginaw Hwy
City: Lansing State: MI
Project #: 30042872 . 03700
Fax #
Client Purchase Order #

Analytical Information

PFAS Method 537 mod. 3 Isotope dilution per QSM 5.1

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	CONTAINER INFORMATION TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZnAc	DI WATER	MeOH	LAB USE ONLY
1	MW-15-72_120320	12-3-20	0955	JJP	GW	2		2								X
2	MW-116-81_120320	12-3-20	1130	JJP	GW	2		2								X
	Dup-02	12-3-20	AM	JJP	GW	2		2								X
3	MW-14-56_120320	12-3-20	1320	AW	GW	2		2								X
4	MW-20-130_120320	12/3/20	1445	AW	GW	2		2								X
5	MW-14-62_120420	12/4/20	1010	AW	GW	2		2								X
6	MW-12-18_120420 MS/MSD	12/4/20	1105	AW	GW	6		6								X
7	MW-14-58_120420	12/4/20	1210	AW	GW	2		2								X
8	Dup-04_120420	12/4/20	—	AW	GW	2		2								X
9	MW-12-09_120420	12/4/20	1315	AW	GW	2		2								X
10	MW-14-59_120420	12/4/20	1400	AW	GW	2		2								X
11	MW-14-60_120420	12/4/20	1455	AW	GW	2		2								X

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

* Report EGLE 28 Compounds

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1	Arcadis	12-3-20 1600	2 Arcadis	3 Arcadis	12/4/20	4 FX
5	FX	12/7/20 9:15	6	7		8

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 1.0

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA81477: Chain of Custody
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SGS Sample Receipt Summary

Job Number: FA81477 **Client:** ARCADIS **Project:** RACER LANDING

Date / Time Received: 12/7/2020 9:15:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 923153821480

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (0.8);

Cooler Temps (Corrected) °C: Cooler 1: (1.0);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☑	☐
2. Trip Blank listed on COC	☐		☑	☐

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: DEVANO Date: 12/7/2020 9:15:00 AM Reviewer: _____ Date: _____

FA81477: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA81477
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83320-MB	2Q59486.D	1	12/10/20	NAF	12/09/20	OP83320	S2Q873

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81477-1, FA81477-2, FA81477-3, FA81477-4, FA81477-5, FA81477-6, FA81477-7, FA81477-8, FA81477-9, FA81477-10, FA81477-11

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	82%	50-150%
	13C4-PFHpA	83%	50-150%
	13C8-PFOA	84%	50-150%
	13C9-PFNA	82%	50-150%

Method Blank Summary

Job Number: FA81477
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83320-MB	2Q59486.D	1	12/10/20	NAF	12/09/20	OP83320	S2Q873

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81477-1, FA81477-2, FA81477-3, FA81477-4, FA81477-5, FA81477-6, FA81477-7, FA81477-8, FA81477-9, FA81477-10, FA81477-11

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	82%	50-150%
	13C7-PFUnDA	77%	40-140%
	13C2-PFDoDA	73%	40-140%
	13C2-PFTeDA	73%	30-130%
	13C3-PFBS	84%	50-150%
	13C3-PFHxS	85%	50-150%
	13C8-PFOS	85%	50-150%
	d3-MeFOSAA	87%	50-150%
	d5-EtFOSAA	88%	50-150%
	13C3-HFPO-DA	92%	50-150%

Instrument Blank

Job Number: FA81477
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q873-IBLK	2Q59466.D	1	12/10/20	NAF	n/a	n/a	S2Q873

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81477-1, FA81477-4, FA81477-6, FA81477-9

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0034	0.0080	0.0020	ug/l	J
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	99%	50-150%
	13C4-PFHpA	99%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	98%	50-150%

Instrument Blank

Job Number: FA81477
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q873-IBLK	2Q59466.D	1	12/10/20	NAF	n/a	n/a	S2Q873

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81477-1, FA81477-4, FA81477-6, FA81477-9

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	101%	50-150%
	13C7-PFUnDA	98%	50-150%
	13C2-PFDoDA	96%	50-150%
	13C2-PFTeDA	95%	50-150%
	13C3-PFBS	101%	50-150%
	13C3-PFHxS	100%	50-150%
	13C8-PFOS	106%	50-150%
	d3-MeFOSAA	107%	50-150%
	d5-EtFOSAA	110%	50-150%

Instrument Blank

Job Number: FA81477
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q874-IBLK	2Q59511.D	1	12/11/20	MV	n/a	n/a	S2Q874

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81477-2, FA81477-3, FA81477-5, FA81477-7, FA81477-8, FA81477-10, FA81477-11

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	97%	50-150%
	13C4-PFHpA	96%	50-150%
	13C8-PFOA	97%	50-150%
	13C9-PFNA	91%	50-150%

Instrument Blank

Job Number: FA81477
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q874-IBLK	2Q59511.D	1	12/11/20	MV	n/a	n/a	S2Q874

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81477-2, FA81477-3, FA81477-5, FA81477-7, FA81477-8, FA81477-10, FA81477-11

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	93%	50-150%
	13C7-PFUnDA	92%	50-150%
	13C2-PFDoDA	89%	50-150%
	13C2-PFTeDA	88%	50-150%
	13C3-PFBS	99%	50-150%
	13C3-PFHxS	99%	50-150%
	13C8-PFOS	96%	50-150%
	d3-MeFOSAA	102%	50-150%
	d5-EtFOSAA	104%	50-150%

Blank Spike Summary

Job Number: FA81477
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83320-BS	2Q59485.D	1	12/10/20	NAF	12/09/20	OP83320	S2Q873

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81477-1, FA81477-2, FA81477-3, FA81477-4, FA81477-5, FA81477-6, FA81477-7, FA81477-8, FA81477-9, FA81477-10, FA81477-11

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0787	98	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0777	97	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0766	96	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0792	99	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0781	98	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0777	97	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0750	94	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0781	98	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0790	99	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0796	100	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0797	100	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0789	99	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0783	98	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0823	103	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0834	104	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0742	93	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0729	91	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0732	92	60-130
754-91-6	PFOSA	0.08	0.0768	96	70-130
2355-31-9	MeFOSAA	0.08	0.0778	97	70-130
2991-50-6	EtFOSAA	0.08	0.0790	99	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0793	99	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0768	96	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0757	95	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0682	85	60-140
919005-14-4	ADONA	0.08	0.0745	93	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0733	92	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0770	96	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C5-PFHxA	93%	50-150%
	13C4-PFHpA	93%	50-150%
	13C8-PFOA	95%	50-150%
	13C9-PFNA	92%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81477
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83320-BS	2Q59485.D	1	12/10/20	NAF	12/09/20	OP83320	S2Q873

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81477-1, FA81477-2, FA81477-3, FA81477-4, FA81477-5, FA81477-6, FA81477-7, FA81477-8, FA81477-9, FA81477-10, FA81477-11

CAS No.	ID Standard Recoveries	BSP	Limits
	13C6-PFDA	94%	50-150%
	13C7-PFUnDA	87%	40-140%
	13C2-PFDoDA	81%	40-140%
	13C2-PFTeDA	80%	30-130%
	13C3-PFBS	95%	50-150%
	13C3-PFHxS	92%	50-150%
	13C8-PFOS	99%	50-150%
	d3-MeFOSAA	100%	50-150%
	d5-EtFOSAA	99%	50-150%
	13C3-HFPO-DA	107%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA81477
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83320-MS	2Q59493.D	1	12/10/20	NAF	12/09/20	OP83320	S2Q873
OP83320-MSD	2Q59494.D	1	12/10/20	NAF	12/09/20	OP83320	S2Q873
FA81477-6	2Q59492.D	1	12/10/20	NAF	12/09/20	OP83320	S2Q873

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81477-1, FA81477-2, FA81477-3, FA81477-4, FA81477-5, FA81477-6, FA81477-7, FA81477-8, FA81477-9, FA81477-10, FA81477-11

CAS No.	Compound	FA81477-6 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	0.0039		0.0714	0.0754	100	0.0714	0.0724	96	4	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.0714	0.0729	102	0.0714	0.0701	98	4	70-130/30
307-24-4	Perfluorohexanoic acid	ND		0.0714	0.0697	98	0.0714	0.0672	94	4	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.0714	0.0724	101	0.0714	0.0709	99	2	70-130/30
335-67-1	Perfluorooctanoic acid	ND		0.0714	0.0732	102	0.0714	0.0703	98	4	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0704	99	0.0714	0.0696	97	1	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0703	98	0.0714	0.0666	93	5	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0714	100	0.0714	0.0700	98	2	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0727	102	0.0714	0.0702	98	3	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0790	111	0.0714	0.0742	104	6	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0735	103	0.0714	0.0699	98	5	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND		0.0714	0.0719	101	0.0714	0.0699	98	3	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0682	95	0.0714	0.0641	90	6	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0746	104	0.0714	0.0694	97	7	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0807	113	0.0714	0.0765	107	5	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	ND		0.0714	0.0682	95	0.0714	0.0693	97	2	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0650	91	0.0714	0.0668	94	3	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0715	100	0.0714	0.0708	99	1	60-130/30
754-91-6	PFOSA	ND		0.0714	0.0732	102	0.0714	0.0704	99	4	70-130/30
2355-31-9	MeFOSAA	ND		0.0714	0.0750	105	0.0714	0.0709	99	6	70-130/30
2991-50-6	EtFOSAA	ND		0.0714	0.0751	105	0.0714	0.0695	97	8	70-130/30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0714	0.0729	102	0.0714	0.0692	97	5	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0708	99	0.0714	0.0694	97	2	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0718	101	0.0714	0.0688	96	4	70-130/30
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0632	88	0.0714	0.0611	86	3	60-140/30
919005-14-4	ADONA	ND		0.0714	0.0649	91	0.0714	0.0636	89	2	60-140/30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0710	99	0.0714	0.0698	98	2	60-140/30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		0.0714	0.0694	97	0.0714	0.0677	95	2	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA81477-6	Limits
	13C4-PFBA			85%	35-135%
	13C5-PFPeA			87%	50-150%
	13C5-PFHxA	86%	85%	85%	50-150%
	13C4-PFHpA	83%	82%	82%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA81477
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83320-MS	2Q59493.D	1	12/10/20	NAF	12/09/20	OP83320	S2Q873
OP83320-MSD	2Q59494.D	1	12/10/20	NAF	12/09/20	OP83320	S2Q873
FA81477-6	2Q59492.D	1	12/10/20	NAF	12/09/20	OP83320	S2Q873

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81477-1, FA81477-2, FA81477-3, FA81477-4, FA81477-5, FA81477-6, FA81477-7, FA81477-8, FA81477-9, FA81477-10, FA81477-11

CAS No.	ID Standard Recoveries	MS	MSD	FA81477-6	Limits
	13C8-PFOA	90%	89%	88%	50-150%
	13C9-PFNA	92%	92%	90%	50-150%
	13C6-PFDA	95%	95%	93%	50-150%
	13C7-PFUnDA	90%	89%	89%	40-140%
	13C2-PFDoDA	87%	89%	86%	40-140%
	13C2-PFTeDA	79%	84%	79%	30-130%
	13C3-PFBS	88%	89%	89%	50-150%
	13C3-PFHxS	84%	87%	86%	50-150%
	13C8-PFOS	100%	95%	98%	50-150%
	13C8-FOSA			86%	30-130%
	d3-MeFOSAA	100%	103%	101%	50-150%
	d5-EtFOSAA	100%	101%	100%	50-150%
	13C2-4:2FTS			83%	50-150%
	13C2-6:2FTS			89%	50-150%
	13C2-8:2FTS			91%	50-150%
	13C3-HFPO-DA	95%	95%	92%	50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA81530

Sampling Dates: 12/07/20 - 12/08/20

Report to:

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Total number of pages in report: 55

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

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Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA81530

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
This report contains results reported as ND = Not detected. The following applies: Organics ND = Not detected above the MDL							
FA81530-1	12/07/20	09:35	AW	12/09/20	AQ	Ground Water	MW-18-103_120720
FA81530-2	12/07/20	10:30	AW	12/09/20	AQ	Ground Water	MW-18-105_120720
FA81530-2D	12/07/20	10:30	AW	12/09/20	AQ	Water Dup/MSD	MW-18-105_120720
FA81530-2S	12/07/20	10:30	AW	12/09/20	AQ	Water Matrix Spike	MW-18-105_120720
FA81530-3	12/07/20	12:00	AW	12/09/20	AQ	Ground Water	MW-18-95_120720
FA81530-4	12/07/20	00:00	AW	12/09/20	AQ	Ground Water	DUP-06_120720
FA81530-5	12/07/20	13:05	AW	12/09/20	AQ	Ground Water	MW-18-91_120720
FA81530-6	12/07/20	14:00	AW	12/09/20	AQ	Ground Water	MW-18-88_120720
FA81530-7	12/07/20	14:50	AW	12/09/20	AQ	Ground Water	MW-18-90_120720
FA81530-8	12/08/20	10:00	AW	12/09/20	AQ	Ground Water	UNK-15_120820
FA81530-9	12/08/20	11:00	AW	12/09/20	AQ	Ground Water	MW-18-89_120820
FA81530-10	12/08/20	11:40	AW	12/09/20	AQ	Ground Water	CH-14-RO_120820

Sample Summary
(continued)

Arcadis

Job No: FA81530

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA81530-11	12/08/20	12:00	AW	12/09/20	AQ	Equipment Blank	EB-03_120820

Summary of Hits

Job Number: FA81530
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/07/20 thru 12/08/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA81530-1	**MW-18-103_120720**					
Perfluorobutanoic acid		0.0094	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0027	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0021	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.00090 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0097	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0070	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0618	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0046	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81530-2	**MW-18-105_120720**					
Perfluorobutanoic acid		0.0021 J	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0026	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0012 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0105	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81530-3	**MW-18-95_120720**					
Perfluorobutanoic acid		0.0059	0.0038	0.0019	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0012 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0015 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0049	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0013 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0020	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0013 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.00098 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0390	0.0019	0.00096	ug/l	EPA 537M BY ID
FA81530-4	**DUP-06_120720**					
Perfluorobutanoic acid		0.0060	0.0037	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0014 J	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0013 J	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0012 J	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0049	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0019	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0014 J	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0015 J	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0392	0.0019	0.00093	ug/l	EPA 537M BY ID
FA81530-5	**MW-18-91_120720**					
Perfluorobutanoic acid		0.0078	0.0036	0.0018	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81530
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/07/20 thru 12/08/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluoropentanoic acid		0.0029	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0025	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0023	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0087	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0017 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0016 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0607	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0067	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81530-6	**MW-18-88_120720**					
Perfluorobutanoic acid		0.0083	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0061	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0017 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0036	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0023	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.155	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81530-7	**MW-18-90_120720**					
Perfluorobutanoic acid		0.0099	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0053	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0070	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0042	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0178	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0016 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0022	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0190	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0336	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		1.06	0.0089	0.0045	ug/l	EPA 537M BY ID
FA81530-8	**UNK-15_120820**					
Perfluorobutanoic acid		0.0159	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0144	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0116	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0082	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0339	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0049	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0018	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0021	0.0018	0.00089	ug/l	EPA 537M BY ID

Summary of Hits

Job Number: FA81530
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/07/20 thru 12/08/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluoropentanesulfonic acid		0.0018	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0161	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0209	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		1.22	0.0089	0.0045	ug/l	EPA 537M BY ID
FA81530-9	**MW-18-89_120820**					
Perfluorobutanoic acid		0.0129	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0093	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0076	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0058	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0171	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0016 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0024	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0072	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0051	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.176	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0014 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81530-10	**CH-14-RO_120820**					
Perfluorobutanoic acid		0.0171	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0135	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0322	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0253	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid [a]		0.0847	0.0089	0.0045	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.00096 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0865	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.189	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid [a]		1.40	0.0089	0.0045	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid [a]		0.486	0.0089	0.0045	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		9.39	0.089	0.045	ug/l	EPA 537M BY ID
FA81530-11	**EB-03_120820**					

No hits reported in this sample.

(a) Dilution required due to matrix interference (ID recovery standard failure).

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-18-103_120720		
Lab Sample ID:	FA81530-1	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59752.D	1	12/15/20 11:47	NAF	12/11/20 13:00	OP83351	S2Q877
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0094	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0027	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0021	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.00090	0.0018	0.00089	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0097	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0070	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0618	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0046	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-103_120720		
Lab Sample ID:	FA81530-1	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	73%		35-135%
	13C5-PFPeA	75%		50-150%
	13C5-PFHxA	75%		50-150%
	13C4-PFHpA	76%		50-150%
	13C8-PFOA	81%		50-150%
	13C9-PFNA	83%		50-150%
	13C6-PFDA	89%		50-150%
	13C7-PFUnDA	81%		40-140%
	13C2-PFDoDA	76%		40-140%
	13C2-PFTeDA	72%		30-130%
	13C3-PFBS	76%		50-150%
	13C3-PFHxS	75%		50-150%
	13C8-PFOS	88%		50-150%
	13C8-FOSA	84%		30-130%
	d3-MeFOSAA	84%		50-150%
	d5-EtFOSAA	79%		50-150%
	13C2-4:2FTS	74%		50-150%
	13C2-6:2FTS	82%		50-150%
	13C2-8:2FTS	83%		50-150%
	13C3-HFPO-DA	87%		50-150%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-105_120720		
Lab Sample ID:	FA81530-2	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59753.D	1	12/15/20 12:02	NAF	12/11/20 13:00	OP83351	S2Q877
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0021	0.0036	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0026	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0012	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0105	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-105_120720		
Lab Sample ID:	FA81530-2	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%		35-135%
	13C5-PFPeA	71%		50-150%
	13C5-PFHxA	70%		50-150%
	13C4-PFHpA	69%		50-150%
	13C8-PFOA	76%		50-150%
	13C9-PFNA	79%		50-150%
	13C6-PFDA	85%		50-150%
	13C7-PFUnDA	79%		40-140%
	13C2-PFDoDA	73%		40-140%
	13C2-PFTeDA	61%		30-130%
	13C3-PFBS	74%		50-150%
	13C3-PFHxS	69%		50-150%
	13C8-PFOS	85%		50-150%
	13C8-FOSA	65%		30-130%
	d3-MeFOSAA	84%		50-150%
	d5-EtFOSAA	81%		50-150%
	13C2-4:2FTS	69%		50-150%
	13C2-6:2FTS	79%		50-150%
	13C2-8:2FTS	82%		50-150%
	13C3-HFPO-DA	81%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-95_120720		
Lab Sample ID:	FA81530-3	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q31518.D	1	12/22/20 07:30	NG	12/18/20 08:00	OP83436	S3Q466
Run #2 [a]	2Q59756.D	1	12/15/20 12:46	NAF	12/11/20 13:00	OP83351	S2Q877

	Initial Volume	Final Volume
Run #1	260 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0059	0.0038	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0019	0.00096	ug/l	
307-24-4	Perfluorohexanoic acid	0.0012	0.0019	0.00096	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0015	0.0019	0.00096	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0049	0.0019	0.00096	ug/l	
375-95-1	Perfluorononanoic acid	0.0013	0.0019	0.00096	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00096	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00096	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00096	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00096	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00096	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0020	0.0019	0.00096	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00096	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0013	0.0019	0.00096	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.00098	0.0019	0.00096	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0390	0.0019	0.00096	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00096	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00096	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA [b]	ND	0.0038	0.0019	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0038	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0038	0.0019	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-95_120720		
Lab Sample ID:	FA81530-3	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0038	0.0019	ug/l	
919005-14-4	ADONA	ND	0.0077	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0077	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0077	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	74%	67%	35-135%
	13C5-PFPeA	76%	66%	50-150%
	13C5-PFHxA	71%	63%	50-150%
	13C4-PFHpA	72%	60%	50-150%
	13C8-PFOA	77%	64%	50-150%
	13C9-PFNA	80%	66%	50-150%
	13C6-PFDA	83%	66%	50-150%
	13C7-PFUnDA	81%	48%	40-140%
	13C2-PFDoDA	79%	25% [c]	40-140%
	13C2-PFTeDA	77%	2% [c]	30-130%
	13C3-PFBS	76%	70%	50-150%
	13C3-PFHxS	76%	64%	50-150%
	13C8-PFOS	81%	70%	50-150%
	13C8-FOSA	28% [c]	15% [c]	30-130%
	d3-MeFOSAA	130%	74%	50-150%
	d5-EtFOSAA	128%	70%	50-150%
	13C2-4:2FTS	69%	63%	50-150%
	13C2-6:2FTS	80%	69%	50-150%
	13C2-8:2FTS	90%	75%	50-150%
	13C3-HFPO-DA	68%	75%	50-150%

(a) Confirmation run.
(b) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-06_120720		
Lab Sample ID:	FA81530-4	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q31519.D	1	12/22/20 07:46	NG	12/18/20 08:00	OP83436	S3Q466
Run #2 [a]	2Q59757.D	1	12/15/20 13:01	NAF	12/11/20 13:00	OP83351	S2Q877

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0060	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0014	0.0019	0.00093	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0013	0.0019	0.00093	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0012	0.0019	0.00093	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0049	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid [b]	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid [b]	ND	0.0019	0.00093	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0019	0.0019	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0014	0.0019	0.00093	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0015	0.0019	0.00093	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0392	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0037	0.0019	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0037	0.0019	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DUP-06_120720		
Lab Sample ID:	FA81530-4	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0037	0.0019	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	73%	60%	35-135%
	13C5-PFPeA	75%	59%	50-150%
	13C5-PFHxA	71%	57%	50-150%
	13C4-PFHpA	73%	54%	50-150%
	13C8-PFOA	77%	58%	50-150%
	13C9-PFNA	79%	60%	50-150%
	13C6-PFDA	81%	62%	50-150%
	13C7-PFUnDA	78%	49%	40-140%
	13C2-PFDoDA	72%	32% [c]	40-140%
	13C2-PFTeDA	44%	5% [c]	30-130%
	13C3-PFBS	75%	63%	50-150%
	13C3-PFHxS	75%	58%	50-150%
	13C8-PFOS	77%	64%	50-150%
	13C8-FOSA	29% [c]	23% [c]	30-130%
	d3-MeFOSAA	127%	72%	50-150%
	d5-EtFOSAA	127%	70%	50-150%
	13C2-4:2FTS	69%	56%	50-150%
	13C2-6:2FTS	80%	62%	50-150%
	13C2-8:2FTS	88%	68%	50-150%
	13C3-HFPO-DA	67%	66%	50-150%

(a) Confirmation run.
(b) Associated ID Standard outside control limits. Confirmed by re-extraction and reanalysis.
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-91_120720		
Lab Sample ID:	FA81530-5	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59760.D	1	12/15/20 13:48	NAF	12/11/20 13:00	OP83351	S2Q877
Run #2 [a]	2Q59844.D	5	12/16/20 11:55	NAF	12/11/20 13:00	OP83351	S2Q878

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0078	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0029	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0025	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0023	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0087	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0011	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0011	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0017	0.0018	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	0.0016	0.0018	0.00089	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0607	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0067	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.018	0.0089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-91_120720		
Lab Sample ID:	FA81530-5	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%	72%	35-135%
	13C5-PFPeA	58%	71%	50-150%
	13C5-PFHxA	55%	67%	50-150%
	13C4-PFHpA	51%	63%	50-150%
	13C8-PFOA	55%	67%	50-150%
	13C9-PFNA	57%	66%	50-150%
	13C6-PFDA	62%	70%	50-150%
	13C7-PFUnDA	60%	68%	40-140%
	13C2-PFDoDA	54%	61%	40-140%
	13C2-PFTeDA	54%	56%	30-130%
	13C3-PFBS	62%	70%	50-150%
	13C3-PFHxS	56%	67%	50-150%
	13C8-PFOS	66%	80%	50-150%
	13C8-FOSA	18% [c]	35%	30-130%
	d3-MeFOSAA	60%	90%	50-150%
	d5-EtFOSAA	62%	91%	50-150%
	13C2-4:2FTS	54%	69%	50-150%
	13C2-6:2FTS	59%	72%	50-150%
	13C2-8:2FTS	70%	75%	50-150%
	13C3-HFPO-DA	62%	76%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-88_120720		
Lab Sample ID:	FA81530-6	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59761.D	1	12/15/20 14:03	NAF	12/11/20 13:00	OP83351	S2Q877
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0083	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0061	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0017	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0036	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0023	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.155	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-88_120720		
Lab Sample ID:	FA81530-6	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%		35-135%
	13C5-PFPeA	70%		50-150%
	13C5-PFHxA	68%		50-150%
	13C4-PFHpA	65%		50-150%
	13C8-PFOA	68%		50-150%
	13C9-PFNA	69%		50-150%
	13C6-PFDA	73%		50-150%
	13C7-PFUnDA	69%		40-140%
	13C2-PFDoDA	65%		40-140%
	13C2-PFTeDA	54%		30-130%
	13C3-PFBS	71%		50-150%
	13C3-PFHxS	64%		50-150%
	13C8-PFOS	72%		50-150%
	13C8-FOSA	52%		30-130%
	d3-MeFOSAA	82%		50-150%
	d5-EtFOSAA	76%		50-150%
	13C2-4:2FTS	66%		50-150%
	13C2-6:2FTS	71%		50-150%
	13C2-8:2FTS	74%		50-150%
	13C3-HFPO-DA	74%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-90_120720		
Lab Sample ID:	FA81530-7	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59762.D	1	12/15/20 14:18	NAF	12/11/20 13:00	OP83351	S2Q877
Run #2	2Q59837.D	5	12/16/20 10:11	NAF	12/11/20 13:00	OP83351	S2Q878

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0099	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0053	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0070	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0042	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0178	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0016	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0015	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0022	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0190	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0336	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	1.06 [a]	0.0089	0.0045	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-90_120720		
Lab Sample ID:	FA81530-7	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	40%	44%	35-135%
	13C5-PFPeA	74%	86%	50-150%
	13C5-PFHxA	71%	82%	50-150%
	13C4-PFHpA	66%	77%	50-150%
	13C8-PFOA	68%	78%	50-150%
	13C9-PFNA	68%	78%	50-150%
	13C6-PFDA	74%	82%	50-150%
	13C7-PFUnDA	70%	76%	40-140%
	13C2-PFDoDA	61%	73%	40-140%
	13C2-PFTeDA	57%	66%	30-130%
	13C3-PFBS	77%	86%	50-150%
	13C3-PFHxS	71%	79%	50-150%
	13C8-PFOS	74%	80%	50-150%
	13C8-FOSA	30%	56%	30-130%
	d3-MeFOSAA	77%	99%	50-150%
	d5-EtFOSAA	82%	97%	50-150%
	13C2-4:2FTS	70%	81%	50-150%
	13C2-6:2FTS	72%	81%	50-150%
	13C2-8:2FTS	82%	86%	50-150%
	13C3-HFPO-DA	79%	94%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNK-15_120820		
Lab Sample ID:	FA81530-8	**Date Sampled:**	12/08/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59763.D	1	12/15/20 14:33	NAF	12/11/20 13:00	OP83351	S2Q877
Run #2	2Q59838.D	5	12/16/20 10:26	NAF	12/11/20 13:00	OP83351	S2Q878

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0159	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0144	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0116	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0082	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0339	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0049	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0018	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0021	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0018	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0161	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0209	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	1.22 [a]	0.0089	0.0045	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNK-15_120820		
Lab Sample ID:	FA81530-8	**Date Sampled:**	12/08/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	74%	86%	35-135%
	13C5-PFPeA	72%	84%	50-150%
	13C5-PFHxA	71%	81%	50-150%
	13C4-PFHpA	64%	74%	50-150%
	13C8-PFOA	70%	80%	50-150%
	13C9-PFNA	68%	80%	50-150%
	13C6-PFDA	77%	86%	50-150%
	13C7-PFUnDA	72%	83%	40-140%
	13C2-PFDoDA	71%	81%	40-140%
	13C2-PFTeDA	68%	78%	30-130%
	13C3-PFBS	76%	85%	50-150%
	13C3-PFHxS	66%	73%	50-150%
	13C8-PFOS	75%	85%	50-150%
	13C8-FOSA	31%	64%	30-130%
	d3-MeFOSAA	85%	98%	50-150%
	d5-EtFOSAA	87%	98%	50-150%
	13C2-4:2FTS	69%	83%	50-150%
	13C2-6:2FTS	72%	83%	50-150%
	13C2-8:2FTS	83%	88%	50-150%
	13C3-HFPO-DA	77%	92%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-89_120820		
Lab Sample ID:	FA81530-9	**Date Sampled:**	12/08/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59764.D	1	12/15/20 14:47	NAF	12/11/20 13:00	OP83351	S2Q877
Run #2 [a]	2Q59845.D	5	12/16/20 12:09	NAF	12/11/20 13:00	OP83351	S2Q878

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0129	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0093	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0076	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0058	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0171	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0015	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0011	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0016	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0024	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0072	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0051	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.176	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0014	0.0018	0.00089	ug/l	J
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND [b]	0.018	0.0089	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-89_120820		
Lab Sample ID:	FA81530-9	**Date Sampled:**	12/08/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	66%	78%	35-135%
	13C5-PFPeA	64%	77%	50-150%
	13C5-PFHxA	63%	72%	50-150%
	13C4-PFHpA	58%	69%	50-150%
	13C8-PFOA	63%	74%	50-150%
	13C9-PFNA	65%	74%	50-150%
	13C6-PFDA	72%	80%	50-150%
	13C7-PFUnDA	69%	78%	40-140%
	13C2-PFDoDA	64%	72%	40-140%
	13C2-PFTeDA	56%	63%	30-130%
	13C3-PFBS	69%	76%	50-150%
	13C3-PFHxS	62%	67%	50-150%
	13C8-PFOS	71%	77%	50-150%
	13C8-FOSA	28% [c]	58%	30-130%
	d3-MeFOSAA	81%	91%	50-150%
	d5-EtFOSAA	84%	93%	50-150%
	13C2-4:2FTS	63%	76%	50-150%
	13C2-6:2FTS	67%	79%	50-150%
	13C2-8:2FTS	78%	84%	50-150%
	13C3-HFPO-DA	72%	86%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CH-14-RO_120820		
Lab Sample ID:	FA81530-10	**Date Sampled:**	12/08/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59765.D	1	12/15/20 15:02	NAF	12/11/20 13:00	OP83351	S2Q877
Run #2 [a]	2Q59839.D	5	12/16/20 10:41	NAF	12/11/20 13:00	OP83351	S2Q878
Run #3	2Q59840.D	50	12/16/20 10:56	NAF	12/11/20 13:00	OP83351	S2Q878

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml
Run #3	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0171	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0135	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0322	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0253	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0847 [b]	0.0089	0.0045	ug/l	
375-95-1	Perfluorononanoic acid	0.00096	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0865	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.189	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	1.40 [b]	0.0089	0.0045	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.486 [b]	0.0089	0.0045	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	9.39 [c]	0.089	0.045	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CH-14-RO_120820		
Lab Sample ID:	FA81530-10	**Date Sampled:**	12/08/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND [b]	0.036	0.0089	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND [b]	0.036	0.0089	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Run# 3	Limits
	13C4-PFBA	78%	88%	97%	35-135%
	13C5-PFPeA	77%	87%	96%	50-150%
	13C5-PFHxA	74%	85%	98%	50-150%
	13C4-PFHpA	61%	82%	96%	50-150%
	13C8-PFOA	45% [d]	79%	100%	50-150%
	13C9-PFNA	65%	83%	99%	50-150%
	13C6-PFDA	88%	92%	104%	50-150%
	13C7-PFUnDA	82%	86%	102%	40-140%
	13C2-PFDoDA	73%	79%	102%	40-140%
	13C2-PFTeDA	63%	74%	105%	30-130%
	13C3-PFBS	78%	88%	96%	50-150%
	13C3-PFHxS	64%	80%	94%	50-150%
	13C8-PFOS	64%	88%	102%	50-150%
	13C8-FOSA	73%	87%	102%	30-130%
	d3-MeFOSAA	85%	87%	104%	50-150%
	d5-EtFOSAA	77%	82%	105%	50-150%
	13C2-4:2FTS	73%	85%	94%	50-150%
	13C2-6:2FTS	28% [d]	69%	96%	50-150%
	13C2-8:2FTS	88%	88%	100%	50-150%
	13C3-HFPO-DA	80%	96%	100%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Result is from Run# 3
(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-03_120820		
Lab Sample ID:	FA81530-11	**Date Sampled:**	12/08/20
Matrix:	AQ - Equipment Blank	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q59841.D	1	12/16/20 11:10	NAF	12/11/20 13:00	OP83351	S2Q878
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-03_120820		
Lab Sample ID:	FA81530-11	**Date Sampled:**	12/08/20
Matrix:	AQ - Equipment Blank	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	87%		35-135%
	13C5-PFPeA	86%		50-150%
	13C5-PFHxA	87%		50-150%
	13C4-PFHpA	86%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	89%		50-150%
	13C6-PFDA	93%		50-150%
	13C7-PFUnDA	88%		40-140%
	13C2-PFDoDA	84%		40-140%
	13C2-PFTeDA	74%		30-130%
	13C3-PFBS	87%		50-150%
	13C3-PFHxS	85%		50-150%
	13C8-PFOS	91%		50-150%
	13C8-FOSA	87%		30-130%
	d3-MeFOSAA	93%		50-150%
	d5-EtFOSAA	90%		50-150%
	13C2-4:2FTS	85%		50-150%
	13C2-6:2FTS	87%		50-150%
	13C2-8:2FTS	87%		50-150%
	13C3-HFPO-DA	97%		50-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

FA 81530

SGS North America Inc - Orlando
Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL: 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # : PAGE 1 OF 1

Plant 3

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information | **Project Information** | **Analytical Information** | **Matrix Codes**

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Tiffany.Linder@arcadis.com Email:
Phone #: 810-225-1928
Sampler(s) Name(s) (Printed) Sampler 1: Austin Westhuis Sampler 2:

Project Name: RACER Lansing
Street: 2800 W. Saginaw Hwy
City: Lansing State: MI
Project #: 30042872.03700
Fax #:
Client Purchase Order #

PFAS via Method 537 modified w/ 3-step elution per QSM 5.1

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	CONTAINER INFORMATION TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZnAc	DI WATER	MEOH	LAB USE ONLY
1	MW-18-103_120720	12/7/20	0935	aw	GW	2		2								
2	MW-18-105_120720 ms/msD	12/7/20	1030	aw	GW	6		6								
3	MW-18-95_120720	12/7/20	1200	aw	GW	2		2								
4	Dup-06_120720	12/7/20	----	aw	GW	2		2								
5	MW-18-91_120720	12/7/20	1305	aw	GW	2		2								
6	MW-18-88_120720	12/7/20	1400	aw	GW	2		2								
7	MW-18-90_120720	12/7/20	1450	aw	GW	2		2								
8	WNK-15_120820	12/8/20	1000	aw	GW	2		2								
9	MW-18-89_120820	12/8/20	1100	aw	GW	2		2								
10	CH-14-RO_120820	12/8/20	1140	aw	GW	2		2								
11	EB-03_120820	12/8/20	1200	aw	GW	2		2								

WITHDRAWN

ACCREDITATION

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

*Report EGLE 28 Compounds

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1 Arcadis	12/8/20 1330	2 FX	3 FX	12.9.20/1030	4
Relinquished by/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
5		6	7		8

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 1.6

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA81530: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA81530 **Client:** ARCADIS **Project:** RACER LANSING

Date / Time Received: 12/9/2020 10:30:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 923153821491

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (1.4);

Cooler Temps (Corrected) °C: Cooler 1: (1.6);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: CARLOSD Date: 12/9/2020 10:30:00 A Reviewer: _____ Date: _____

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83351-MB	2Q59741.D	1	12/15/20	NAF	12/11/20	OP83351	S2Q877

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-1, FA81530-2, FA81530-5, FA81530-6, FA81530-7, FA81530-8, FA81530-9, FA81530-10, FA81530-11

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	87%	50-150%
	13C4-PFHpA	87%	50-150%
	13C8-PFOA	90%	50-150%
	13C9-PFNA	87%	50-150%

Method Blank Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83351-MB	2Q59741.D	1	12/15/20	NAF	12/11/20	OP83351	S2Q877

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-1, FA81530-2, FA81530-5, FA81530-6, FA81530-7, FA81530-8, FA81530-9, FA81530-10, FA81530-11

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	92%	50-150%
	13C7-PFUnDA	87%	40-140%
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	85%	30-130%
	13C3-PFBS	88%	50-150%
	13C3-PFHxS	88%	50-150%
	13C8-PFOS	93%	50-150%
	d3-MeFOSAA	84%	50-150%
	d5-EtFOSAA	83%	50-150%

Method Blank Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83436-MB	3Q31526.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-3, FA81530-4

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	91%	35-135%
	13C5-PFPeA	90%	50-150%
	13C5-PFHxA	89%	50-150%
	13C4-PFHpA	89%	50-150%

Method Blank Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83436-MB	3Q31526.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-3, FA81530-4

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	89%	50-150%
	13C9-PFNA	83%	50-150%
	13C6-PFDA	79%	50-150%
	13C7-PFUnDA	70%	40-140%
	13C2-PFDoDA	67%	40-140%
	13C2-PFTeDA	39%	30-130%
	13C3-PFBS	89%	50-150%
	13C3-PFHxS	89%	50-150%
	13C8-PFOS	76%	50-150%
	13C8-FOSA	55%	30-130%
	d3-MeFOSAA	86%	50-150%
	d5-EtFOSAA	87%	50-150%
	13C2-4:2FTS	83%	50-150%
	13C2-6:2FTS	81%	50-150%
	13C2-8:2FTS	72%	50-150%

Instrument Blank

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q877-IBLK	2Q59737.D	1	12/15/20	NAF	n/a	n/a	S2Q877

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81530-1, FA81530-2, FA81530-5, FA81530-6, FA81530-7, FA81530-8, FA81530-9, FA81530-10

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	101%	50-150%
	13C4-PFHpA	103%	50-150%
	13C8-PFOA	104%	50-150%
	13C9-PFNA	103%	50-150%

Instrument Blank

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q877-IBLK	2Q59737.D	1	12/15/20	NAF	n/a	n/a	S2Q877

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81530-1, FA81530-2, FA81530-5, FA81530-6, FA81530-7, FA81530-8, FA81530-9, FA81530-10

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	107%	50-150%
	13C7-PFUnDA	106%	50-150%
	13C2-PFDoDA	107%	50-150%
	13C2-PFTeDA	112%	50-150%
	13C3-PFBS	101%	50-150%
	13C3-PFHxS	106%	50-150%
	13C8-PFOS	110%	50-150%
	d3-MeFOSAA	98%	50-150%
	d5-EtFOSAA	96%	50-150%

Instrument Blank

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q878-IBLK	2Q59833.D	1	12/16/20	NAF	n/a	n/a	S2Q878

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81530-5, FA81530-7, FA81530-8, FA81530-9, FA81530-10, FA81530-11

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C5-PFHxA	101%	50-150%
	13C4-PFHpA	101%	50-150%
	13C8-PFOA	104%	50-150%
	13C9-PFNA	102%	50-150%

Instrument Blank

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q878-IBLK	2Q59833.D	1	12/16/20	NAF	n/a	n/a	S2Q878

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81530-5, FA81530-7, FA81530-8, FA81530-9, FA81530-10, FA81530-11

CAS No.	ID Standard Recoveries		Limits
	13C6-PFDA	109%	50-150%
	13C7-PFUnDA	106%	50-150%
	13C2-PFDoDA	107%	50-150%
	13C2-PFTeDA	111%	50-150%
	13C3-PFBS	101%	50-150%
	13C3-PFHxS	99%	50-150%
	13C8-PFOS	108%	50-150%
	d3-MeFOSAA	108%	50-150%
	d5-EtFOSAA	109%	50-150%

Instrument Blank

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q466-IBLK	3Q31460.D	1	12/21/20	NG	n/a	n/a	S3Q466

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81530-3, FA81530-4

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	99%	50-150%
	13C5-PFPeA	97%	50-150%
	13C5-PFHxA	97%	50-150%
	13C4-PFHpA	98%	50-150%

Instrument Blank

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q466-IBLK	3Q31460.D	1	12/21/20	NG	n/a	n/a	S3Q466

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81530-3, FA81530-4

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	99%	50-150%
	13C9-PFNA	98%	50-150%
	13C6-PFDA	99%	50-150%
	13C7-PFUnDA	98%	50-150%
	13C2-PFDoDA	98%	50-150%
	13C2-PFTeDA	104%	50-150%
	13C3-PFBS	95%	50-150%
	13C3-PFHxS	97%	50-150%
	13C8-PFOS	96%	50-150%
	13C8-FOSA	101%	50-150%
	d3-MeFOSAA	105%	50-150%
	d5-EtFOSAA	107%	50-150%
	13C2-4:2FTS	89%	50-150%
	13C2-6:2FTS	88%	50-150%
	13C2-8:2FTS	85%	50-150%

Blank Spike Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83351-BS	2Q59740.D	1	12/15/20	NAF	12/11/20	OP83351	S2Q877

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-1, FA81530-2, FA81530-5, FA81530-6, FA81530-7, FA81530-8, FA81530-9, FA81530-10, FA81530-11

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0740	93	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0782	98	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0756	95	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0783	98	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0757	95	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0749	94	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0741	93	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0767	96	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0775	97	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0752	94	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0754	94	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0746	93	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0730	91	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0752	94	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0752	94	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0755	94	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0740	93	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0737	92	60-130
754-91-6	PFOSA	0.08	0.0750	94	70-130
2355-31-9	MeFOSAA	0.08	0.0787	98	70-130
2991-50-6	EtFOSAA	0.08	0.0744	93	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0762	95	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0760	95	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0754	94	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0679	85	60-140
919005-14-4	ADONA	0.08	0.0736	92	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0777	97	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0748	94	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C5-PFHxA	86%	50-150%
	13C4-PFHpA	86%	50-150%
	13C8-PFOA	88%	50-150%
	13C9-PFNA	86%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83351-BS	2Q59740.D	1	12/15/20	NAF	12/11/20	OP83351	S2Q877

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-1, FA81530-2, FA81530-5, FA81530-6, FA81530-7, FA81530-8, FA81530-9, FA81530-10, FA81530-11

CAS No.	ID Standard Recoveries	BSP	Limits
	13C6-PFDA	90%	50-150%
	13C7-PFUnDA	85%	40-140%
	13C2-PFDoDA	84%	40-140%
	13C2-PFTeDA	84%	30-130%
	13C3-PFBS	87%	50-150%
	13C3-PFHxS	87%	50-150%
	13C8-PFOS	92%	50-150%
	d3-MeFOSAA	81%	50-150%
	d5-EtFOSAA	81%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83436-BS	3Q31525.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-3, FA81530-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0737	92	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0753	94	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0775	97	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0837	105	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0746	93	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0718	90	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0773	97	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0748	94	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0741	93	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0975	122	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0716	90	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0762	95	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0766	96	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0713	89	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0857	107	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0769	96	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0733	92	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0729	91	60-130
754-91-6	PFOSA	0.08	0.0757	95	70-130
2355-31-9	MeFOSAA	0.08	0.0773	97	70-130
2991-50-6	EtFOSAA	0.08	0.0788	99	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0767	96	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0787	98	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0807	101	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0760	95	60-140
919005-14-4	ADONA	0.08	0.0749	94	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0700	88	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0742	93	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	91%	35-135%
	13C5-PFPeA	89%	50-150%
	13C5-PFHxA	89%	50-150%
	13C4-PFHpA	89%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83436-BS	3Q31525.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-3, FA81530-4

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	89%	50-150%
	13C9-PFNA	85%	50-150%
	13C6-PFDA	83%	50-150%
	13C7-PFUnDA	76%	40-140%
	13C2-PFDoDA	71%	40-140%
	13C2-PFTeDA	50%	30-130%
	13C3-PFBS	89%	50-150%
	13C3-PFHxS	89%	50-150%
	13C8-PFOS	82%	50-150%
	13C8-FOSA	67%	30-130%
	d3-MeFOSAA	90%	50-150%
	d5-EtFOSAA	86%	50-150%
	13C2-4:2FTS	86%	50-150%
	13C2-6:2FTS	85%	50-150%
	13C2-8:2FTS	78%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83436-MS	3Q31528.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466
DA31227-1	3Q31527.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-3, FA81530-4

CAS No.	Compound	DA31227-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0105		0.0714	0.0760	92	70-130
2706-90-3	Perfluoropentanoic acid	0.0161		0.0714	0.0839	95	70-130
307-24-4	Perfluorohexanoic acid	0.0124		0.0714	0.0807	96	70-130
375-85-9	Perfluoroheptanoic acid	0.0054		0.0714	0.0804	105	70-130
335-67-1	Perfluorooctanoic acid	0.0119		0.0714	0.0778	92	70-130
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0658	92	70-130
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0699	98	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0663	93	70-130
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0666	93	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0898	126	65-130
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0641	90	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0186		0.0714	0.0860	94	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0693	97	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0045		0.0714	0.0685	90	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0771	108	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0095		0.0714	0.0802	99	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0666	93	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0632	88	60-130
754-91-6	PFOSA	ND		0.0714	0.0705	99	70-130
2355-31-9	MeFOSAA	ND		0.0714	0.0692	97	70-130
2991-50-6	EtFOSAA	ND		0.0714	0.0723	101	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0714	0.0684	96	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0692	97	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0717	100	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0671	94	60-140
919005-14-4	ADONA	ND		0.0714	0.0667	93	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0635	89	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		0.0714	0.0664	93	60-140

CAS No.	ID Standard Recoveries	MS	DA31227-1	Limits
	13C4-PFBA	85%	86%	35-135%
	13C5-PFPeA	85%	85%	50-150%
	13C5-PFHxA	83%	85%	50-150%
	13C4-PFHpA	85%	87%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83436-MS	3Q31528.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466
DA31227-1	3Q31527.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-3, FA81530-4

CAS No.	ID Standard Recoveries	MS	DA31227-1	Limits
	13C8-PFOA	87%	89%	50-150%
	13C9-PFNA	85%	87%	50-150%
	13C6-PFDA	81%	83%	50-150%
	13C7-PFUnDA	74%	71%	40-140%
	13C2-PFDoDA	65%	63%	40-140%
	13C2-PFTeDA	42%	54%	30-130%
	13C3-PFBS	86%	85%	50-150%
	13C3-PFHxS	86%	86%	50-150%
	13C8-PFOS	82%	82%	50-150%
	13C8-FOSA	21%* [a]	37%	30-130%
	d3-MeFOSAA	91%	89%	50-150%
	d5-EtFOSAA	85%	84%	50-150%
	13C2-4:2FTS	85%	80%	50-150%
	13C2-6:2FTS	86%	83%	50-150%
	13C2-8:2FTS	79%	75%	50-150%

(a) Outside control limits.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83351-MS	2Q59754.D	1	12/15/20	NAF	12/11/20	OP83351	S2Q877
OP83351-MSD	2Q59755.D	1	12/15/20	NAF	12/11/20	OP83351	S2Q877
FA81530-2	2Q59753.D	1	12/15/20	NAF	12/11/20	OP83351	S2Q877

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-1, FA81530-2, FA81530-5, FA81530-6, FA81530-7, FA81530-8, FA81530-9, FA81530-10, FA81530-11

CAS No.	Compound	FA81530-2 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	0.0021	J	0.0714	0.0676	92	0.0714	0.0678	92	0	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.0714	0.0683	96	0.0714	0.0678	95	1	70-130/30
307-24-4	Perfluorohexanoic acid	ND		0.0714	0.0642	90	0.0714	0.0645	90	0	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.0714	0.0682	95	0.0714	0.0678	95	1	70-130/30
335-67-1	Perfluorooctanoic acid	ND		0.0714	0.0673	94	0.0714	0.0680	95	1	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0641	90	0.0714	0.0639	89	0	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0635	89	0.0714	0.0632	88	0	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0663	93	0.0714	0.0668	94	1	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0665	93	0.0714	0.0678	95	2	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0758	106	0.0714	0.0701	98	8	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0663	93	0.0714	0.0656	92	1	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0026		0.0714	0.0663	89	0.0714	0.0667	90	1	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0575	80	0.0714	0.0575	80	0	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.0012	J	0.0714	0.0648	89	0.0714	0.0663	91	2	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0688	96	0.0714	0.0704	99	2	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0105		0.0714	0.0745	90	0.0714	0.0745	90	0	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0632	88	0.0714	0.0639	89	1	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0627	88	0.0714	0.0645	90	3	60-130/30
754-91-6	PFOSA	ND		0.0714	0.0666	93	0.0714	0.0651	91	2	70-130/30
2355-31-9	MeFOSAA	ND		0.0714	0.0641	90	0.0714	0.0654	92	2	70-130/30
2991-50-6	EtFOSAA	ND		0.0714	0.0645	90	0.0714	0.0659	92	2	70-130/30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.0714	0.0666	93	0.0714	0.0657	92	1	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0666	93	0.0714	0.0680	95	2	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0651	91	0.0714	0.0660	92	1	70-130/30
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0573	80	0.0714	0.0566	79	1	60-140/30
919005-14-4	ADONA	ND		0.0714	0.0608	85	0.0714	0.0608	85	0	60-140/30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0659	92	0.0714	0.0656	92	0	60-140/30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		0.0714	0.0670	94	0.0714	0.0670	94	0	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA81530-2	Limits
	13C4-PFBA			70%	35-135%
	13C5-PFPeA			71%	50-150%
	13C5-PFHxA	73%	71%	70%	50-150%
	13C4-PFHpA	71%	71%	69%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83351-MS	2Q59754.D	1	12/15/20	NAF	12/11/20	OP83351	S2Q877
OP83351-MSD	2Q59755.D	1	12/15/20	NAF	12/11/20	OP83351	S2Q877
FA81530-2	2Q59753.D	1	12/15/20	NAF	12/11/20	OP83351	S2Q877

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-1, FA81530-2, FA81530-5, FA81530-6, FA81530-7, FA81530-8, FA81530-9, FA81530-10, FA81530-11

CAS No.	ID Standard Recoveries	MS	MSD	FA81530-2	Limits
	13C8-PFOA	78%	77%	76%	50-150%
	13C9-PFNA	81%	82%	79%	50-150%
	13C6-PFDA	86%	86%	85%	50-150%
	13C7-PFUnDA	79%	81%	79%	40-140%
	13C2-PFDoDA	73%	77%	73%	40-140%
	13C2-PFTeDA	57%	69%	61%	30-130%
	13C3-PFBS	76%	75%	74%	50-150%
	13C3-PFHxS	75%	73%	69%	50-150%
	13C8-PFOS	85%	85%	85%	50-150%
	13C8-FOSA			65%	30-130%
	d3-MeFOSAA	84%	86%	84%	50-150%
	d5-EtFOSAA	79%	82%	81%	50-150%
	13C2-4:2FTS			69%	50-150%
	13C2-6:2FTS			79%	50-150%
	13C2-8:2FTS			82%	50-150%
	13C3-HFPO-DA			81%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83436-DUP	3Q31534.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466
FA81784-2	3Q31533.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-3, FA81530-4

CAS No.	Compound	FA81784-2 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.0080	U	ND		nc	30
2706-90-3	Perfluoropentanoic acid	0.0034	I	0.0034	J	0	30
307-24-4	Perfluorohexanoic acid	0.0026	I	0.0028	J	7	30
375-85-9	Perfluoroheptanoic acid	0.0040	U	ND		nc	30
335-67-1	Perfluorooctanoic acid	0.0022	I	0.0023	J	4	30
375-95-1	Perfluorononanoic acid	0.0040	U	ND		nc	30
335-76-2	Perfluorodecanoic acid	0.0040	U	ND		nc	30
2058-94-8	Perfluoroundecanoic acid	0.0040	U	ND		nc	30
307-55-1	Perfluorododecanoic acid	0.0040	U	ND		nc	30
72629-94-8	Perfluorotridecanoic acid	0.0040	U	ND		nc	30
376-06-7	Perfluorotetradecanoic acid	0.0040	U	ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0021	I	ND		200*	30
2706-91-4	Perfluoropentanesulfonic acid	0.0040	U	ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	0.0040	U	ND		nc	30
375-92-8	Perfluoroheptanesulfonic acid	0.0040	U	ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0040	U	ND		nc	30
68259-12-1	Perfluorononanesulfonic acid	0.0040	U	ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	0.0040	U	ND		nc	30
754-91-6	PFOSA	0.0080	U	ND		nc	30
2355-31-9	MeFOSAA	0.0080	U	ND		nc	30
2991-50-6	EtFOSAA	0.0080	U	ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	0.016	U	ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	0.016	U	ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	0.016	U	ND		nc	30
13252-13-6	HFPO-DA (GenX)	0.0080	U	ND		nc	30
919005-14-4	ADONA	0.016	U	ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.016	U	ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.016	U	ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA81784-2	Limits
	13C4-PFBA	99%		35-135%
	13C5-PFPeA	98%		50-150%
	13C5-PFHxA	97%		50-150%
	13C4-PFHpA	100%		50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81530
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83436-DUP	3Q31534.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466
FA81784-2	3Q31533.D	1	12/22/20	NG	12/18/20	OP83436	S3Q466

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81530-3, FA81530-4

CAS No.	ID Standard Recoveries	DUP	FA81784-2	Limits
	13C8-PFOA	100%	95%	50-150%
	13C9-PFNA	98%		50-150%
	13C6-PFDA	104%		50-150%
	13C7-PFUnDA	96%		40-140%
	13C2-PFDoDA	88%		40-140%
	13C2-PFTeDA	81%		30-130%
	13C3-PFBS	97%		50-150%
	13C3-PFHxS	99%		50-150%
	13C8-PFOS	95%	91%	50-150%
	13C8-FOSA	103%		30-130%
	d3-MeFOSAA	121%		50-150%
	d5-EtFOSAA	120%		50-150%
	13C2-4:2FTS	95%		50-150%
	13C2-6:2FTS	98%		50-150%
	13C2-8:2FTS	95%		50-150%

* = Outside of Control Limits.

The results set forth herein are provided by SGS North America Inc.

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Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA81534

Sampling Dates: 12/07/20 - 12/08/20

Report to:

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Total number of pages in report: 47

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

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SGS North America Inc.

Sample Summary

Arcadis

Job No: FA81534

Racer Lansing PFAS Delineation; Lansing, MI
Project No: 30042872.03700

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
FA81534-1	12/07/20	09:50	DR	12/09/20	AQ	Ground Water	MW-18-101_120720
FA81534-2	12/07/20	11:25	DR	12/09/20	AQ	Ground Water	MW-18-97_120720
FA81534-3	12/07/20	12:35	DR	12/09/20	AQ	Ground Water	MW-18-93_120720
FA81534-4	12/07/20	14:10	DR	12/09/20	AQ	Ground Water	MW-18-94_120720
FA81534-5	12/08/20	09:55	DR	12/09/20	AQ	Ground Water	MW-91-2R_120820
FA81534-6	12/08/20	11:30	DR	12/09/20	AQ	Ground Water	MW-23_120820
FA81534-7	12/08/20	13:00	DR	12/09/20	AQ	Ground Water	MW-02-04(3)_120820
FA81534-8	12/07/20	10:00	DR	12/09/20	AQ	Equipment Blank	EB-02_120720

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Summary of Hits

Job Number: FA81534
Account: Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI
Collected: 12/07/20 thru 12/08/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA81534-1	**MW-18-101_120720**					
Perfluorobutanoic acid		0.0022 J	0.0036	0.0018	ug/l	EPA 537M BY ID
FA81534-2	**MW-18-97_120720**					
No hits reported in this sample.						
FA81534-3	**MW-18-93_120720**					
No hits reported in this sample.						
FA81534-4	**MW-18-94_120720**					
Perfluorobutanoic acid		0.0028 J	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0014 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81534-5	**MW-91-2R_120820**					
No hits reported in this sample.						
FA81534-6	**MW-23_120820**					
No hits reported in this sample.						
FA81534-7	**MW-02-04(3)_120820**					
Perfluorobutanoic acid		0.0080	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0063	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0018	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA81534-8	**EB-02_120720**					
No hits reported in this sample.						

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-18-101_120720		
Lab Sample ID:	FA81534-1	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q31370.D	1	12/17/20 04:55	NG	12/12/20 08:30	OP83355	S3Q464
Run #2 [a]	4Q9440.D	1	12/22/20 13:59	NG	12/19/20 10:00	OP83449	S4Q130

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0022	0.0036	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid [b]	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid [c]	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid [b]	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-101_120720		
Lab Sample ID:	FA81534-1	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Mino [b]	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	75%	74%	35-135%
	13C5-PFPeA	79%	85%	50-150%
	13C5-PFHxA	79%	92%	50-150%
	13C4-PFHpA	82%	95%	50-150%
	13C8-PFOA	85%	99%	50-150%
	13C9-PFNA	83%	93%	50-150%
	13C6-PFDA	74%	80%	50-150%
	13C7-PFUnDA	49%	45%	40-140%
	13C2-PFDoDA	25%	19% [d]	40-140%
	13C2-PFTeDA	3%	8% [d]	30-130%
	13C3-PFBS	79%	85%	50-150%
	13C3-PFHxS	81%	97%	50-150%
	13C8-PFOS	75%	81%	50-150%
	13C8-FOSA	47%	47%	30-130%
	d3-MeFOSAA	64%	66%	50-150%
	d5-EtFOSAA	52%	50%	50-150%
	13C2-4:2FTS	76%	89%	50-150%
	13C2-6:2FTS	79%	97%	50-150%
	13C2-8:2FTS	67%	76%	50-150%
	13C3-HFPO-DA	74%	91%	50-150%

(a) Confirmation run.
(b) Associated ID Standard outside control limits. Confirmed by re-extraction and reanalysis.
(c) Associated BS recovery outside control limits.Associated ID Standard outside control limits. Confirmed by re-extraction and reanalysis.
(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-97_120720		
Lab Sample ID:	FA81534-2	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q31371.D	1	12/17/20 05:11	NG	12/12/20 08:30	OP83355	S3Q464
Run #2 [a]	3Q31420.D	5	12/17/20 18:31	NG	12/12/20 08:30	OP83355	S3Q464

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND [b]	0.0089	0.0045	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND [b]	0.0089	0.0045	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-97_120720		
Lab Sample ID:	FA81534-2	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	81%	93%	35-135%
	13C5-PFPeA	82%	92%	50-150%
	13C5-PFHxA	81%	90%	50-150%
	13C4-PFHpA	83%	90%	50-150%
	13C8-PFOA	88%	93%	50-150%
	13C9-PFNA	89%	91%	50-150%
	13C6-PFDA	83%	89%	50-150%
	13C7-PFUnDA	69%	78%	40-140%
	13C2-PFDoDA	49%	71%	40-140%
	13C2-PFTeDA	12% [c]	36%	30-130%
	13C3-PFBS	82%	91%	50-150%
	13C3-PFHxS	83%	90%	50-150%
	13C8-PFOS	81%	84%	50-150%
	13C8-FOSA	66%	78%	30-130%
	d3-MeFOSAA	80%	84%	50-150%
	d5-EtFOSAA	72%	79%	50-150%
	13C2-4:2FTS	78%	85%	50-150%
	13C2-6:2FTS	84%	85%	50-150%
	13C2-8:2FTS	77%	80%	50-150%
	13C3-HFPO-DA	74%	85%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-93_120720		
Lab Sample ID:	FA81534-3	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q31372.D	1	12/17/20 05:26	NG	12/12/20 08:30	OP83355	S3Q464
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid [a]	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-93_120720		
Lab Sample ID:	FA81534-3	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	83%		35-135%
	13C5-PFPeA	86%		50-150%
	13C5-PFHxA	87%		50-150%
	13C4-PFHpA	87%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	89%		50-150%
	13C6-PFDA	88%		50-150%
	13C7-PFUnDA	83%		40-140%
	13C2-PFDoDA	75%		40-140%
	13C2-PFTeDA	42%		30-130%
	13C3-PFBS	86%		50-150%
	13C3-PFHxS	88%		50-150%
	13C8-PFOS	85%		50-150%
	13C8-FOSA	87%		30-130%
	d3-MeFOSAA	93%		50-150%
	d5-EtFOSAA	90%		50-150%
	13C2-4:2FTS	82%		50-150%
	13C2-6:2FTS	83%		50-150%
	13C2-8:2FTS	82%		50-150%
	13C3-HFPO-DA	78%		50-150%

(a) Associated BS recovery outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-94_120720		
Lab Sample ID:	FA81534-4	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9441.D	1	12/22/20 14:15	NG	12/19/20 10:00	OP83449	S4Q130
Run #2 [a]	3Q31373.D	1	12/17/20 05:42	NG	12/12/20 08:30	OP83355	S3Q464

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0028	0.0036	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0014	0.0018	0.00089	ug/l	J
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid [b]	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid [b]	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid [b]	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-18-94_120720		
Lab Sample ID:	FA81534-4	**Date Sampled:**	12/07/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Mino [b]	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	72%	89%	35-135%
	13C5-PFPeA	89%	91%	50-150%
	13C5-PFHxA	97%	89%	50-150%
	13C4-PFHpA	100%	93%	50-150%
	13C8-PFOA	104%	94%	50-150%
	13C9-PFNA	100%	67%	50-150%
	13C6-PFDA	91%	29% [c]	50-150%
	13C7-PFUnDA	66%	8% [c]	40-140%
	13C2-PFDoDA	37% [c]	2% [c]	40-140%
	13C2-PFTeDA	7% [c]	0% [c]	30-130%
	13C3-PFBS	89%	90%	50-150%
	13C3-PFHxS	101%	91%	50-150%
	13C8-PFOS	93%	37% [c]	50-150%
	13C8-FOSA	32%	11% [c]	30-130%
	d3-MeFOSAA	77%	16% [c]	50-150%
	d5-EtFOSAA	60%	9% [c]	50-150%
	13C2-4:2FTS	92%	85%	50-150%
	13C2-6:2FTS	98%	87%	50-150%
	13C2-8:2FTS	86%	30% [c]	50-150%
	13C3-HFPO-DA	95%	83%	50-150%

(a) Confirmation run.
(b) Associated ID Standard outside control limits. Confirmed by re-extraction and reanalysis.
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-91-2R_120820		
Lab Sample ID:	FA81534-5	**Date Sampled:**	12/08/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q31374.D	1	12/17/20 05:58	NG	12/12/20 08:30	OP83355	S3Q464
Run #2 [a]	3Q31422.D	5	12/17/20 19:02	NG	12/12/20 08:30	OP83355	S3Q464

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND [b]	0.0089	0.0045	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND [b]	0.0089	0.0045	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-91-2R_120820		
Lab Sample ID:	FA81534-5	**Date Sampled:**	12/08/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	76%	88%	35-135%
	13C5-PFPeA	77%	87%	50-150%
	13C5-PFHxA	77%	85%	50-150%
	13C4-PFHpA	79%	86%	50-150%
	13C8-PFOA	85%	88%	50-150%
	13C9-PFNA	85%	87%	50-150%
	13C6-PFDA	83%	84%	50-150%
	13C7-PFUnDA	73%	75%	40-140%
	13C2-PFDoDA	61%	68%	40-140%
	13C2-PFTeDA	23% [c]	50%	30-130%
	13C3-PFBS	78%	88%	50-150%
	13C3-PFHxS	80%	85%	50-150%
	13C8-PFOS	82%	83%	50-150%
	13C8-FOSA	76%	78%	30-130%
	d3-MeFOSAA	86%	81%	50-150%
	d5-EtFOSAA	79%	78%	50-150%
	13C2-4:2FTS	74%	82%	50-150%
	13C2-6:2FTS	79%	82%	50-150%
	13C2-8:2FTS	74%	75%	50-150%
	13C3-HFPO-DA	70%	83%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run# 2
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-23_120820		
Lab Sample ID:	FA81534-6	**Date Sampled:**	12/08/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q31377.D	1	12/17/20 06:46	NG	12/12/20 08:30	OP83355	S3Q464
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid [a]	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-23_120820		
Lab Sample ID:	FA81534-6	**Date Sampled:**	12/08/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	87%		35-135%
	13C5-PFPeA	89%		50-150%
	13C5-PFHxA	89%		50-150%
	13C4-PFHpA	92%		50-150%
	13C8-PFOA	96%		50-150%
	13C9-PFNA	96%		50-150%
	13C6-PFDA	94%		50-150%
	13C7-PFUnDA	85%		40-140%
	13C2-PFDoDA	75%		40-140%
	13C2-PFTeDA	43%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	93%		50-150%
	13C8-PFOS	92%		50-150%
	13C8-FOSA	86%		30-130%
	d3-MeFOSAA	95%		50-150%
	d5-EtFOSAA	89%		50-150%
	13C2-4:2FTS	84%		50-150%
	13C2-6:2FTS	89%		50-150%
	13C2-8:2FTS	85%		50-150%
	13C3-HFPO-DA	82%		50-150%

(a) Associated BS recovery outside control limits.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-02-04(3)_120820		
Lab Sample ID:	FA81534-7	**Date Sampled:**	12/08/20
Matrix:	AQ - Ground Water	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9442.D	1	12/22/20 14:30	NG	12/19/20 10:00	OP83449	S4Q130
Run #2 [a]	3Q31378.D	1	12/17/20 07:01	NG	12/12/20 08:30	OP83355	S3Q464

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.0080	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0063	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0018	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid [b]	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid [b]	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW-02-04(3)_120820
Lab Sample ID: FA81534-7
Matrix: AQ - Ground Water
Method: EPA 537M BY ID EPA 537 MOD
Project: Racer Lansing PFAS Delineation; Lansing, MI

Date Sampled: 12/08/20
Date Received: 12/09/20
Percent Solids: n/a

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	61%	81%	35-135%
	13C5-PFPeA	77%	84%	50-150%
	13C5-PFHxA	87%	85%	50-150%
	13C4-PFHpA	91%	87%	50-150%
	13C8-PFOA	96%	84%	50-150%
	13C9-PFNA	94%	56%	50-150%
	13C6-PFDA	86%	26% [c]	50-150%
	13C7-PFUnDA	69%	9% [c]	40-140%
	13C2-PFDoDA	52%	3% [c]	40-140%
	13C2-PFTeDA	19% [c]	2% [c]	30-130%
	13C3-PFBS	78%	84%	50-150%
	13C3-PFHxS	92%	83%	50-150%
	13C8-PFOS	87%	31% [c]	50-150%
	13C8-FOSA	44%	10% [c]	30-130%
	d3-MeFOSAA	80%	16% [c]	50-150%
	d5-EtFOSAA	70%	12% [c]	50-150%
	13C2-4:2FTS	85%	81%	50-150%
	13C2-6:2FTS	93%	79%	50-150%
	13C2-8:2FTS	82%	28% [c]	50-150%
	13C3-HFPO-DA	85%	81%	50-150%

(a) Confirmation run.
(b) Associated ID Standard outside control limits. Confirmed by re-extraction and reanalysis.
(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-02_120720		
Lab Sample ID:	FA81534-8	**Date Sampled:**	12/07/20
Matrix:	AQ - Equipment Blank	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q31379.D	1	12/17/20 07:17	NG	12/12/20 08:30	OP83355	S3Q464
Run #2							

	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid [a]	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-02_120720		
Lab Sample ID:	FA81534-8	**Date Sampled:**	12/07/20
Matrix:	AQ - Equipment Blank	**Date Received:**	12/09/20
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
NEXT GENERATION PFAS ANALYTES						
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	94%		35-135%
	13C5-PFPeA	92%		50-150%
	13C5-PFHxA	91%		50-150%
	13C4-PFHpA	91%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	92%		50-150%
	13C6-PFDA	93%		50-150%
	13C7-PFUnDA	88%		40-140%
	13C2-PFDoDA	82%		40-140%
	13C2-PFTeDA	76%		30-130%
	13C3-PFBS	92%		50-150%
	13C3-PFHxS	92%		50-150%
	13C8-PFOS	89%		50-150%
	13C8-FOSA	90%		30-130%
	d3-MeFOSAA	93%		50-150%
	d5-EtFOSAA	87%		50-150%
	13C2-4:2FTS	85%		50-150%
	13C2-6:2FTS	85%		50-150%
	13C2-8:2FTS	84%		50-150%
	13C3-HFPO-DA	86%		50-150%

(a) Associated BS recovery outside control limits.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

SGS North America Inc - Orlando
Chain of Custody

Plant 3 FA81534

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # : PAGE 1 OF 1

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: Arcadis
Address: 28550 Cabot Dr Suite 500
City: Novi State: MI Zip: 48377
Project Contact: Tiffany Linder Email: Tiffany.Linder@arcadis.com
Phone #: 517 861 0138
Sampler(s) Name(s) (Printed) Sampler 1: David Richmond Sampler 2:

Project Information

Project Name: Racer Lansing
Street: 2800 W. Saginaw Hwy.
City: Lansing State: MI
Project #: 30042872.03700
Fax #:
Client Purchase Order #:

Analytical Information

PFAS isotope dilution per QSM 5.1 modified 537 modified

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	CONTAINER INFORMATION: OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZnAc	DI WATER	MEOH	LAB USE ONLY
1	MW-18-101_120720	12/7/20	0950	DRR	GW	2		X								X	
2	MW-18-97_120720	12/7/20	1125	DRR	GW	2		X								X	
3	MW-18-93_120720	12/7/20	1235	DRR	GW	2		X								X	
4	MW-18-94_120720	12/7/20	1410	DRR	GW	2		X								X	
5	MW-91-2R_120820	12/8/20	0955	DRR	GW	2		X								X	
6	MW-23_120820	12/8/20	1130	DRR	GW	2		X								X	
7	MW-02-04(3)_120820	12/8/20	1300	DRR	GW	2		X								X	
			1000														
8	EB-02_120720	12/7/20		DRR	WW	2		X								X	

Turnaround Time (Business days)

10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

*Report EGLE 28 compounds
INITIAL ASSESSMENT DO
RE-VERIFICATION MK

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1	Arcadis	12/8/20 1340	2 FX	3 FX		4 12/9/20 1030
5	Relinquished by/Affiliation	Date Time:	6 Received By/Affiliation	7 Relinquished By/Affiliation	Date Time:	8 Received By/Affiliation

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 3.6

http://www.sgs.com/en/terms-and-conditions

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA81534: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA81534 **Client:** ARCADIS **Project:** RACER LANSING

Date / Time Received: 12/9/2020 10:30:00 AM **Delivery Method:** FX **Airbill #'s:** 9231 5382 1506

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** N/A

Cooler Temps (Raw Measured) °C: Cooler 1: (3.4);

Cooler Temps (Corrected) °C: Cooler 1: (3.6);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☐		☐
4. Cooler temp verification	N/A		
5. Cooler media	N/A		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑
	W	**or**	**S**	**N/A**
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☐	☑
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: PETERH Date: 12/9/2020 10:30:00 A Reviewer: _____ Date: _____

FA81534: Chain of Custody
Page 2 of 2

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Instrument Blank

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q130-IBLK	4Q9433.D	1	12/22/20	NG	n/a	n/a	S4Q130

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-4, FA81534-7

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	104%	50-150%
	13C9-PFNA	103%	50-150%
	13C8-PFOS	104%	50-150%

Method Blank Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83355-MB	3Q31366.D	1	12/17/20	NG	12/12/20	OP83355	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	89%	35-135%
	13C5-PFPeA	86%	50-150%
	13C5-PFHxA	86%	50-150%
	13C4-PFHpA	86%	50-150%

Method Blank Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83355-MB	3Q31366.D	1	12/17/20	NG	12/12/20	OP83355	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	88%	50-150%
	13C9-PFNA	87%	50-150%
	13C6-PFDA	85%	50-150%
	13C7-PFUnDA	79%	40-140%
	13C2-PFDoDA	73%	40-140%
	13C2-PFTeDA	59%	30-130%
	13C3-PFBS	86%	50-150%
	13C3-PFHxS	86%	50-150%
	13C8-PFOS	83%	50-150%
	13C8-FOSA	85%	30-130%
	d3-MeFOSAA	87%	50-150%
	d5-EtFOSAA	86%	50-150%
	13C2-4:2FTS	80%	50-150%
	13C2-6:2FTS	80%	50-150%
	13C2-8:2FTS	77%	50-150%

Method Blank Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83449-MB	4Q9439.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-4, FA81534-7

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	87%	35-135%
	13C5-PFPeA	91%	50-150%
	13C5-PFHxA	91%	50-150%
	13C4-PFHpA	91%	50-150%

Method Blank Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83449-MB	4Q9439.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-4, FA81534-7

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	93%	50-150%
	13C9-PFNA	91%	50-150%
	13C6-PFDA	92%	50-150%
	13C7-PFUnDA	86%	40-140%
	13C2-PFDoDA	79%	40-140%
	13C2-PFTeDA	71%	30-130%
	13C3-PFBS	91%	50-150%
	13C3-PFHxS	89%	50-150%
	13C8-PFOS	91%	50-150%
	13C8-FOSA	85%	30-130%
	d3-MeFOSAA	94%	50-150%
	d5-EtFOSAA	88%	50-150%
	13C2-4:2FTS	85%	50-150%
	13C2-6:2FTS	89%	50-150%
	13C2-8:2FTS	87%	50-150%

Instrument Blank

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q464-IBLK	3Q31303.D	1	12/16/20	NG	n/a	n/a	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries		Limits
	13C4-PFBA	104%	50-150%
	13C5-PFPeA	101%	50-150%
	13C5-PFHxA	101%	50-150%
	13C4-PFHpA	101%	50-150%

Instrument Blank

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q464-IBLK	3Q31303.D	1	12/16/20	NG	n/a	n/a	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M QSM5.3 B-15

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	ID Standard Recoveries		Limits
	13C8-PFOA	103%	50-150%
	13C9-PFNA	102%	50-150%
	13C6-PFDA	103%	50-150%
	13C7-PFUnDA	105%	50-150%
	13C2-PFDoDA	105%	50-150%
	13C2-PFTeDA	110%	50-150%
	13C3-PFBS	102%	50-150%
	13C3-PFHxS	103%	50-150%
	13C8-PFOS	99%	50-150%
	13C8-FOSA	107%	50-150%
	d3-MeFOSAA	105%	50-150%
	d5-EtFOSAA	104%	50-150%
	13C2-4:2FTS	95%	50-150%
	13C2-6:2FTS	94%	50-150%
	13C2-8:2FTS	91%	50-150%

Blank Spike Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83355-BS	3Q31365.D	1	12/17/20	NG	12/12/20	OP83355	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0780	98	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0792	99	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0820	103	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0895	112	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0800	100	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0771	96	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0838	105	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0802	100	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0782	98	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.172	215*	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0779	97	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0799	100	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0798	100	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0769	96	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0871	109	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0809	101	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0785	98	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0717	90	60-130
754-91-6	PFOSA	0.08	0.0816	102	70-130
2355-31-9	MeFOSAA	0.08	0.0809	101	70-130
2991-50-6	EtFOSAA	0.08	0.0836	105	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0799	100	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0802	100	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0828	104	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0816	102	60-140
919005-14-4	ADONA	0.08	0.0816	102	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0721	90	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0814	102	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	90%	35-135%
	13C5-PFPeA	87%	50-150%
	13C5-PFHxA	86%	50-150%
	13C4-PFHpA	86%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83355-BS	3Q31365.D	1	12/17/20	NG	12/12/20	OP83355	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	88%	50-150%
	13C9-PFNA	87%	50-150%
	13C6-PFDA	85%	50-150%
	13C7-PFUnDA	76%	40-140%
	13C2-PFDoDA	56%	40-140%
	13C2-PFTeDA	15%* [a]	30-130%
	13C3-PFBS	87%	50-150%
	13C3-PFHxS	85%	50-150%
	13C8-PFOS	84%	50-150%
	13C8-FOSA	80%	30-130%
	d3-MeFOSAA	84%	50-150%
	d5-EtFOSAA	75%	50-150%
	13C2-4:2FTS	86%	50-150%
	13C2-6:2FTS	84%	50-150%
	13C2-8:2FTS	82%	50-150%

(a) Outside control limits.

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83355-BS	3Q31433.D	1	12/17/20	NG	12/12/20	OP83355	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0786	98	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0782	98	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0809	101	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0884	111	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0793	99	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0758	95	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0827	103	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0805	101	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0792	99	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0900	113	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0770	96	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0794	99	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0804	101	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0750	94	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0859	107	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0827	103	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0810	101	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0757	95	60-130
754-91-6	PFOSA	0.08	0.0817	102	70-130
2355-31-9	MeFOSAA	0.08	0.0815	102	70-130
2991-50-6	EtFOSAA	0.08	0.0838	105	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0802	100	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0816	102	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0845	106	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0771	96	60-140
919005-14-4	ADONA	0.08	0.0797	100	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0754	94	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0758	95	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	89%	35-135%
	13C5-PFPeA	88%	50-150%
	13C5-PFHxA	86%	50-150%
	13C4-PFHpA	86%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83355-BS	3Q31433.D	1	12/17/20	NG	12/12/20	OP83355	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	88%	50-150%
	13C9-PFNA	87%	50-150%
	13C6-PFDA	85%	50-150%
	13C7-PFUnDA	80%	40-140%
	13C2-PFDoDA	73%	40-140%
	13C2-PFTeDA	62%	30-130%
	13C3-PFBS	87%	50-150%
	13C3-PFHxS	86%	50-150%
	13C8-PFOS	84%	50-150%
	13C8-FOSA	82%	30-130%
	d3-MeFOSAA	85%	50-150%
	d5-EtFOSAA	80%	50-150%
	13C2-4:2FTS	84%	50-150%
	13C2-6:2FTS	83%	50-150%
	13C2-8:2FTS	81%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83449-BS	4Q9438.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-4, FA81534-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0725	91	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0728	91	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0720	90	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0718	90	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0721	90	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0722	90	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0721	90	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0715	89	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0719	90	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0738	92	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0732	92	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0732	92	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0722	90	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0698	87	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0730	91	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0689	86	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0702	88	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0662	83	60-130
754-91-6	PFOSA	0.08	0.0721	90	70-130
2355-31-9	MeFOSAA	0.08	0.0707	88	70-130
2991-50-6	EtFOSAA	0.08	0.0743	93	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.08	0.0750	94	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0746	93	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0743	93	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0737	92	60-140
919005-14-4	ADONA	0.08	0.0675	84	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.08	0.0648	81	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.08	0.0699	87	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	89%	35-135%
	13C5-PFPeA	93%	50-150%
	13C5-PFHxA	94%	50-150%
	13C4-PFHpA	94%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83449-BS	4Q9438.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-4, FA81534-7

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	95%	50-150%
	13C9-PFNA	93%	50-150%
	13C6-PFDA	94%	50-150%
	13C7-PFUnDA	90%	40-140%
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	78%	30-130%
	13C3-PFBS	92%	50-150%
	13C3-PFHxS	94%	50-150%
	13C8-PFOS	95%	50-150%
	13C8-FOSA	81%	30-130%
	d3-MeFOSAA	97%	50-150%
	d5-EtFOSAA	94%	50-150%
	13C2-4:2FTS	93%	50-150%
	13C2-6:2FTS	94%	50-150%
	13C2-8:2FTS	94%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83355-MS	3Q31425.D	5	12/17/20	NG	12/12/20	OP83355	S3Q464
FA81537-1	3Q31380.D	1	12/17/20	NG	12/12/20	OP83355	S3Q464
FA81537-1 [a]	3Q31424.D	5	12/17/20	NG	12/12/20	OP83355	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	Compound	FA81537-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0237		0.16	0.172	93	70-130
2706-90-3	Perfluoropentanoic acid	0.0351		0.16	0.178	89	70-130
307-24-4	Perfluorohexanoic acid	0.0290		0.16	0.189	100	70-130
375-85-9	Perfluoroheptanoic acid	0.0189		0.16	0.211	120	70-130
335-67-1	Perfluorooctanoic acid	0.0376		0.16	0.186	93	70-130
375-95-1	Perfluorononanoic acid	0.0080		0.16	0.165	98	70-130
335-76-2	Perfluorodecanoic acid	0.020	U [b]	0.16	0.159	99	70-130
2058-94-8	Perfluoroundecanoic acid	0.020	U [b]	0.16	0.158	99	70-130
307-55-1	Perfluorododecanoic acid	0.020	U [b]	0.16	0.151	94	70-130
72629-94-8	Perfluorotridecanoic acid	0.020	U [b]	0.16	0.521	326*	65-130
376-06-7	Perfluorotetradecanoic acid	0.020	U [b]	0.16	0.143	89	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0108		0.16	0.156	91	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.0040	U	0.16	0.178	111	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0166		0.16	0.177	100	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.0040	U	0.16	0.173	108	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.385		0.16	0.564	112	70-130
68259-12-1	Perfluorononanesulfonic acid	0.0040	U	0.16	0.179	112	65-130
335-77-3	Perfluorodecanesulfonic acid	0.020	U [b]	0.16	0.131	82	60-130
754-91-6	PFOSA	0.040	U [b]	0.16	0.163	102	70-130
2355-31-9	MeFOSAA	0.040	U [b]	0.16	0.161	101	70-130
2991-50-6	EtFOSAA	0.040	U [b]	0.16	0.171	107	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	0.016	U	0.16	0.157	98	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.016	U	0.16	0.157	98	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.016	U	0.16	0.161	101	70-130
13252-13-6	HFPO-DA (GenX)	0.0080	U	0.16	0.151	94	60-140
919005-14-4	ADONA	0.016	U	0.16	0.149	93	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.016	U	0.16	0.148	93	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.016	U	0.16	0.169	106	60-140

CAS No.	ID Standard Recoveries	MS	FA81537-1	FA81537-1	Limits
	13C4-PFBA	89%	58%	82%	35-135%
	13C5-PFPeA	88%	61%	81%	50-150%
	13C5-PFHxA	81%	52%	75%	50-150%
	13C4-PFHpA	79%	51%	73%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83355-MS	3Q31425.D	5	12/17/20	NG	12/12/20	OP83355	S3Q464
FA81537-1	3Q31380.D	1	12/17/20	NG	12/12/20	OP83355	S3Q464
FA81537-1 [a]	3Q31424.D	5	12/17/20	NG	12/12/20	OP83355	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	ID Standard Recoveries	MS	FA81537-1	FA81537-1	Limits
	13C8-PFOA	84%	55%	78%	50-150%
	13C9-PFNA	86%	54%	82%	50-150%
	13C6-PFDA	85%	48%* [c]	85%	50-150%
	13C7-PFUnDA	82%	32%* [c]	77%	40-140%
	13C2-PFDoDA	67%	16%* [c]	51%	40-140%
	13C2-PFTeDA	9%* [c]	2%* [c]	6%* [c]	30-130%
	13C3-PFBS	88%	63%	82%	50-150%
	13C3-PFHxS	84%	59%	80%	50-150%
	13C8-PFOS	82%	57%	79%	50-150%
	13C8-FOSA	23%* [c]	3%* [c]	21%* [c]	30-130%
	d3-MeFOSAA	111%	37%* [c]	110%	50-150%
	d5-EtFOSAA	114%	34%* [c]	111%	50-150%
	13C2-4:2FTS	83%	52%	74%	50-150%
	13C2-6:2FTS	90%	56%	79%	50-150%
	13C2-8:2FTS	94%	53%	89%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run #2.
(c) Outside control limits.

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83449-MS	4Q9452.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130
FA81772-1	4Q9451.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-4, FA81534-7

CAS No.	Compound	FA81772-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	ND		0.16	0.146	91	70-130
2706-90-3	Perfluoropentanoic acid	ND		0.16	0.145	91	70-130
307-24-4	Perfluorohexanoic acid	ND		0.16	0.144	90	70-130
375-85-9	Perfluoroheptanoic acid	ND		0.16	0.145	91	70-130
335-67-1	Perfluorooctanoic acid	ND		0.16	0.144	90	70-130
375-95-1	Perfluorononanoic acid	ND		0.16	0.144	90	70-130
335-76-2	Perfluorodecanoic acid	ND		0.16	0.148	93	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.16	0.145	91	70-130
307-55-1	Perfluorododecanoic acid	ND		0.16	0.145	91	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.16	0.149	93	65-130
376-06-7	Perfluorotetradecanoic acid	ND		0.16	0.148	93	70-130
375-73-5	Perfluorobutanesulfonic acid	ND		0.16	0.144	90	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.16	0.142	89	70-130
355-46-4	Perfluorohexanesulfonic acid	ND		0.16	0.143	89	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.16	0.147	92	70-130
1763-23-1	Perfluorooctanesulfonic acid	ND		0.16	0.142	89	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.16	0.146	91	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.16	0.131	82	60-130
754-91-6	PFOSA	ND		0.16	0.144	90	70-130
2355-31-9	MeFOSAA	ND		0.16	0.142	89	70-130
2991-50-6	EtFOSAA	ND		0.16	0.147	92	70-130
757124-72-4	4:2 Fluorotelomer sulfonate	ND		0.16	0.150	94	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.16	0.148	93	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.16	0.153	96	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.16	0.148	93	60-140
919005-14-4	ADONA	ND		0.16	0.135	84	60-140
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		0.16	0.131	82	60-140
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		0.16	0.137	86	60-140

CAS No.	ID Standard Recoveries	MS	FA81772-1	Limits
	13C4-PFBA	97%	94%	35-135%
	13C5-PFPeA	100%	98%	50-150%
	13C5-PFHxA	101%	98%	50-150%
	13C4-PFHpA	100%	99%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83449-MS	4Q9452.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130
FA81772-1	4Q9451.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-4, FA81534-7

CAS No.	ID Standard Recoveries	MS	FA81772-1	Limits
	13C8-PFOA	102%	101%	50-150%
	13C9-PFNA	102%	100%	50-150%
	13C6-PFDA	101%	100%	50-150%
	13C7-PFUnDA	100%	95%	40-140%
	13C2-PFDoDA	94%	89%	40-140%
	13C2-PFTeDA	87%	83%	30-130%
	13C3-PFBS	100%	98%	50-150%
	13C3-PFHxS	100%	97%	50-150%
	13C8-PFOS	100%	92%	50-150%
	13C8-FOSA	92%	82%	30-130%
	d3-MeFOSAA	106%	108%	50-150%
	d5-EtFOSAA	101%	97%	50-150%
	13C2-4:2FTS	99%	93%	50-150%
	13C2-6:2FTS	102%	98%	50-150%
	13C2-8:2FTS	102%	96%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83355-DUP	3Q31427.D	5	12/17/20	NG	12/12/20	OP83355	S3Q464
FA81537-4	3Q31384.D	1	12/17/20	NG	12/12/20	OP83355	S3Q464
FA81537-4 [a]	3Q31426.D	5	12/17/20	NG	12/12/20	OP83355	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	Compound	FA81537-4 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.0505		0.0512		1	30
2706-90-3	Perfluoropentanoic acid	0.141		0.143		1	30
307-24-4	Perfluorohexanoic acid	0.0884		0.0916		4	30
375-85-9	Perfluoroheptanoic acid	0.0422		0.0445		5	30
335-67-1	Perfluorooctanoic acid	0.0451		0.0475		5	30
375-95-1	Perfluorononanoic acid	0.0047		ND		200*	30
335-76-2	Perfluorodecanoic acid	0.0040 U		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	0.0040 U		ND		nc	30
307-55-1	Perfluorododecanoic acid	0.0040 U		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	0.020 U [b]		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	0.020 U [b]		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0128		0.0201		44*	30
2706-91-4	Perfluoropentanesulfonic acid	0.0066		ND		200*	30
355-46-4	Perfluorohexanesulfonic acid	0.0273		0.0279		2	30
375-92-8	Perfluoroheptanesulfonic acid	0.0030	I	ND		200*	30
1763-23-1	Perfluorooctanesulfonic acid	0.0885		0.0910		3	30
68259-12-1	Perfluorononanesulfonic acid	0.0040 U		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	0.0040 U		ND		nc	30
754-91-6	PFOSA	0.0080 U		ND		nc	30
2355-31-9	MeFOSAA	0.0080 U		ND		nc	30
2991-50-6	EtFOSAA	0.0140		ND		200*	30
757124-72-4	4:2 Fluorotelomer sulfonate	0.016 U		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	0.0650		0.0718	J	10	30
39108-34-4	8:2 Fluorotelomer sulfonate	0.016 U		ND		nc	30
13252-13-6	HFPO-DA (GenX)	0.0080 U		ND		nc	30
919005-14-4	ADONA	0.016 U		ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	0.016 U		ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	0.016 U		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA81537-4	FA81537-4	Limits
	13C4-PFBA	102%	73%	90%	35-135%
	13C5-PFPeA	100%	74%	89%	50-150%
	13C5-PFHxA	97%	71%	85%	50-150%
	13C4-PFHpA	98%	74%	85%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83355-DUP	3Q31427.D	5	12/17/20	NG	12/12/20	OP83355	S3Q464
FA81537-4	3Q31384.D	1	12/17/20	NG	12/12/20	OP83355	S3Q464
FA81537-4 [a]	3Q31426.D	5	12/17/20	NG	12/12/20	OP83355	S3Q464

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-1, FA81534-2, FA81534-3, FA81534-5, FA81534-6, FA81534-8

CAS No.	ID Standard Recoveries	DUP	FA81537-4	FA81537-4	Limits
	13C8-PFOA	103%	79%	91%	50-150%
	13C9-PFNA	105%	82%	91%	50-150%
	13C6-PFDA	105%	83%	89%	50-150%
	13C7-PFUnDA	90%	76%	84%	40-140%
	13C2-PFDoDA	69%	55%	77%	40-140%
	13C2-PFTeDA	42%	24%* [c]	48%	30-130%
	13C3-PFBS	103%	76%	91%	50-150%
	13C3-PFHxS	101%	76%	91%	50-150%
	13C8-PFOS	101%	80%	87%	50-150%
	13C8-FOSA	88%	48%	81%	30-130%
	d3-MeFOSAA	112%	112%	97%	50-150%
	d5-EtFOSAA	105%	111%	93%	50-150%
	13C2-4:2FTS	94%	70%	83%	50-150%
	13C2-6:2FTS	102%	81%	88%	50-150%
	13C2-8:2FTS	96%	86%	83%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).
(b) Result is from Run #2.
(c) Outside control limits.

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83449-DUP	4Q9445.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130
FA81712-70	4Q9444.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-4, FA81534-7

CAS No.	Compound	FA81712-70 ug/l	Q	DUP ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.0117		0.0119		2	30
2706-90-3	Perfluoropentanoic acid	0.0370		0.0382		3	30
307-24-4	Perfluorohexanoic acid	0.0255		0.0273		7	30
375-85-9	Perfluoroheptanoic acid	0.0187		0.0199		6	30
335-67-1	Perfluorooctanoic acid	0.0215		0.0225		5	30
375-95-1	Perfluorononanoic acid	0.0673		0.0697		4	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	ND		0.0021	J	200*	30
2706-91-4	Perfluoropentanesulfonic acid	0.0022	J	0.0024	J	9	30
355-46-4	Perfluorohexanesulfonic acid	0.0259		0.0278		7	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0424		0.0421		1	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-4	4:2 Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	0.0085	J	0.0090	J	6	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA81712-70	Limits
	13C4-PFBA	89%		35-135%
	13C5-PFPeA	94%		50-150%
	13C5-PFHxA	97%	95%	50-150%
	13C4-PFHpA	98%	97%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA81534
Account: ARCMIL Arcadis
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83449-DUP	4Q9445.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130
FA81712-70	4Q9444.D	1	12/22/20	NG	12/19/20	OP83449	S4Q130

The QC reported here applies to the following samples: **Method:** EPA 537M BY ID

FA81534-4, FA81534-7

CAS No.	ID Standard Recoveries	DUP	FA81712-70	Limits
	13C8-PFOA	102%	100%	50-150%
	13C9-PFNA	101%	99%	50-150%
	13C6-PFDA	103%	99%	50-150%
	13C7-PFUnDA	94%	88%	40-140%
	13C2-PFDoDA	89%	86%	40-140%
	13C2-PFTeDA	86%	84%	30-130%
	13C3-PFBS	95%	94%	50-150%
	13C3-PFHxS	97%	97%	50-150%
	13C8-PFOS	101%	95%	50-150%
	13C8-FOSA	90%		30-130%
	d3-MeFOSAA	107%	100%	50-150%
	d5-EtFOSAA	100%	97%	50-150%
	13C2-4:2FTS	93%		50-150%
	13C2-6:2FTS	98%		50-150%
	13C2-8:2FTS	96%		50-150%
	13C3-HFPO-DA		92%	50-150%

* = Outside of Control Limits.

Appendix C

Low-Flow Logs

(on attached CD)

Groundwater Sampling Form

Project Number	30042872	**Well ID**	CH-14-RO			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.65	**Total Depth (ft-bmp)**	14.8	**Water Column(ft)**	7	**Gallons in Well**	1.16
MP Elevation		**Pump Intake (ft-bmp)**	12	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:55	**Volumes Purged**		**Sample ID**	CH-14-RO_060820	**Sampled by**	Jacob Pisarkiewicz
Purge Start	15:25	**Gallons Purged**					
Purge End	15:50			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:35		200	7.9	0.00	7.14	0.8	0.02	0.44	20.2	56.5	Clear	None
15:40	5	200	7.9	0.00	7.11	0.79	0.02	0.43	19.4	61.6	Clear	None
15:45	5	200	7.9	0.00	7.11	0.79	0.02	0.43	19.5	62.7	Clear	None
15:50	5	200	7.9	0.00	7.11	0.79	0.02	0.42	19.4	63.2	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None
Metals	250 mL Plastic	1	HNO3
hexavalent chromium	125 mL Plastic	1	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-01(2)			**Date**	6/10/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.33	**Total Depth (ft-bmp)**	16	**Water Column(ft)**	9	**Gallons in Well**	1.41
MP Elevation		**Pump Intake (ft-bmp)**	14	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:20	**Volumes Purged**		**Sample ID**	MW-01 (2)_061020	**Sampled by**	Jacob Pisarkiewicz
Purge Start	10:40	**Gallons Purged**					
Purge End	11:15			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:50		200	7.89	0.00	6.76	3.56	0.54	0.89	18.8	46.6	Clear	None
10:55	5	200	8.2	0.00	6.77	3.93	0.02	0.88	18.7	20.5	Clear	None
11:00	5	200	8.2	0.00	6.79	4.17	0.02	0.84	19.1	6.7	Clear	None
11:05	5	200	8.2	0.00	6.85	4.3	0.02	0.77	19.1	-14.2	Clear	None
11:10	5	200	8.2	0.00	6.85	4.3	0.02	0.75	19.2	-16.3	Clear	None
11:15	5	200	8.2	0.00	6.86	4.31	0.02	0.78	19.2	-17.4	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-02-02(3)			**Date**	6/11/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 70F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	57.62	**Total Depth (ft-bmp)**	83.6	**Water Column(ft)**	26	**Gallons in Well**	4.22
MP Elevation		**Pump Intake (ft-bmp)**	82.1	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:25	**Volumes Purged**		**Sample ID**	MW-02-02 (3)_061120	**Sampled by**	Austin Westhuis
Purge Start	09:00	**Gallons Purged**					
Purge End	09:30			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:05		200	57.62	0.26	6.35	4.86	3.8	0.02	14.6	37.9	Clear	None
09:10	5	200	57.62	0.53	6.35	4.87	2.44	0.02	14.6	36.7	Clear	None
09:15	5	200	57.62	0.79	6.35	4.86	2.22	0.01	14.6	35.5	Clear	None
09:20	5	200	57.62	1.06	6.36	4.87	1.91	0.01	14.4	37.4	Clear	None
09:25	5	200	57.62	1.32	6.36	4.88	1.74	0.01	14.4	37.6	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-02-03(6)			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Overcast, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	28.01	**Total Depth (ft-bmp)**	44.8	**Water Column(ft)**	17	**Gallons in Well**	2.73
MP Elevation		**Pump Intake (ft-bmp)**	40	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:35	**Volumes Purged**		**Sample ID**	MW-02-03(6)	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**	0.00				
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:25		250	32.28	0.00	7.18	0.36	116	11.63	16.9	-21.4	Cloudy	None
11:30	5	250	32.28	0.00	7.21	0.273	115	9.09	15.9	-76.7	Cloudy	None
11:35	5	250	34.63	0.00	7.35	0.44	98.3	8.66	14.6	-72	Cloudy	None
11:40	5	250	34.96	0.00	7.48	0.14	110	8.16	15.1	-59.1	Cloudy	None
11:45	5	250	34.96	0.00	7.53	0.16	141	8.04	14.4	-56	Cloudy	None
11:50	5	250	35.75	0.00	7.5	-32	706	8.57	16.3	-44.2	Cloudy	None
11:55	5	250	35.75	0.00	7.71	0.127	851	8.41	17.8	-31.1	Cloudy	None
12:00	5	250	36.9	0.00	7.48	6.32	656	9.87	15.3	-91.7	Cloudy	None
12:05	5	250	37.81	0.00	7.47	5.76	667	9.4	15	-100.9	Cloudy	None
12:10	5	250	37.97	0.00	7.49	7.96	202	9.24	15	-98.8	Cloudy	None
12:15	5	250	38.45	0.00	7.45	7.67	753	9.16	15	-100.1	Cloudy	None
12:20	5	250	39.27	0.00	7.4	7.69	496	9.11	15.1	-98.6	Cloudy	None
12:25	5	250	39.8	0.00	7.4	7.24	421	9.41	15.2	-100	Cloudy	None
12:30	5	250	40.12	0.00	7.5	7.34	384	9.65	15.1	-99.3	Cloudy	None

Constituent Sampled	Container	Number	Preservative
SVOCs	1L Amber	1	None
1,4-Dioxane	50 mL Glass	3	HCL

Comments: High turbidity and unstable readings

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-02-04(3)			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	55.91	**Total Depth (ft-bmp)**	84	**Water Column(ft)**	28	**Gallons in Well**	4.56
MP Elevation		**Pump Intake (ft-bmp)**	83.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:35	**Volumes Purged**		**Sample ID**	MW-02-04 (3)_060820	**Sampled by**	Austin Westhuis
Purge Start	10:05	**Gallons Purged**					
Purge End	10:40			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:10		200	55.91	0.26	6.68	5.57	24.7	0.02	14.5	-30.3	Clear	None
10:15	5	200	55.91	0.53	6.73	5.48	15.6	0.01	14.5	-35.8	Clear	None
10:20	5	200	55.91	0.79	6.74	5.43	8.68	0.01	14.5	-35.9	Clear	None
10:25	5	200	55.91	1.06	6.74	5.43	3.38	0.01	14.4	-35.6	Clear	None
10:30	5	200	55.91	1.32	6.74	5.43	2.96	0.01	14.3	-36.2	Clear	None
10:35	5	200	55.91	1.59	6.75	5.41	2.7	0.01	14.3	-36	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
1,4-Dioxane	40 mL Glass	3	HCL
Metals	125 mL Plastic	1	HNO3

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-02-04(3)			**Date**	12/08/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	58.12	**Total Depth (ft-bmp)**	84	**Water Column(ft)**	25.88	**Gallons in Well**	4.21
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:00	**Volumes Purged**	0.83	**Sample ID**	MW-02-04(3)	**Sampled by**	Donald Richmond
Purge Start	12:00	**Gallons Purged**	3.50	**Replicate/ Code No.**			
Purge End	13:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:15	0	0	100	45.24	--	6.86	4.77	62.6	8.32	9.3	49	--	--
12:20	5	5	100	45.24	--	6.87	4.8	65.6	8	9.4	-1.9	--	--
12:25	5	10	100	45.24	--	6.87	4.77	95.4	7.34	9.2	-46.8	--	--
12:30	5	15	100	45.24	--	6.87	4.81	138	6.85	9.5	-56.2	--	--
12:35	5	20	100	45.24	--	6.87	4.79	149	6.63	9.3	-58.5	--	--
12:40	5	25	100	45.24	--	6.88	4.78	154	6.47	9.3	-60.8	--	--
12:45	5	30	100	45.24	--	6.88	4.68	137	6.18	8.5	-63.5	--	--
12:50	5	35	100	45.24	--	6.88	4.71	126	5.83	8.7	-64.9	--	--
12:55	5	40	100	45.24	--	6.89	4.71	135	5.58	9	-65.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good condition

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Flush mount

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-03-05			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Overcast, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	23.23	**Total Depth (ft-bmp)**	48.51	**Water Column(ft)**	25	**Gallons in Well**	4.11
MP Elevation		**Pump Intake (ft-bmp)**	35	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:25	**Volumes Purged**		**Sample ID**	MW-03-05	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:35		250	23.23	0.00	7.68	2.6	53.2	9.15	14.3	-2.9	Clear	None
09:40	5	250	25.94	0.00	7.69	2.6	52.4	9.13	13.2	-67.9	Clear	None
09:45	5	250	26.88	0.00	7.7	2.6	57.7	8.23	13.2	-80.9	Clear	None
09:50	5	250	29.55	0.00	7.7	2.6	48.2	8.01	13	-89.4	Clear	None
09:55	5	250	31.3	0.00	7.71	7.75	38.4	8.08	13.3	-93.5	Clear	None
10:00	5	250	31.95	0.00	7.72	2.6	25.1	7.78	13.1	-97.1	Clear	None
10:05	5	250	32.4	0.00	7.72	2.6	45.1	7.07	13.3	-98.8	Clear	None
10:10	5	250	33.12	0.00	7.72	2.6	28.4	6.83	13.2	-100	Clear	None
10:15	5	250	34.05	0.00	7.73	2.6	22.8	6.79	13.1	-100.1	Clear	None
10:25	10	250	34.05	0.00	7.72	2.6	20.1	6.32	13.2	-104.1	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
VOCs	40 mL Glass	3	HCL
1,4-Dioxane	40 mL Glass		HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	20G200

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-03-06			**Date**	6/2/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	36.05	**Total Depth (ft-bmp)**	41	**Water Column(ft)**	5	**Gallons in Well**	0.8
MP Elevation		**Pump Intake (ft-bmp)**	39	**Purge Method**	No-Purge	**Sample Method**	Volumetric
Sample Time	15:10	**Volumes Purged**		**Sample ID**	MW-03-06	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:35		250	36.25	0.00	6.82	10.33	8.26	0.84	15.2	-35.4	Clear	None
14:40	5	250	36.25	0.00	6.82	10.32	9.95	0.6	15	-37.8	Clear	None
14:45	5	250	36.25	0.00	6.83	10.32	12.4	0.49	15.1	-44.2	Clear	None
14:50	5	250	36.25	0.00	6.83	10.3	11	0.46	14.7	-45.1	Clear	None
14:55	5	250	36.25	0.00	6.84	10.29	0.5	0.36	14.5	-49	Clear	None
15:00	5	250	36.25	0.00	6.84	10.3	0.5	0.37	14.7	-51.3	Clear	None
15:05	5	250	36.25	0.00	6.84	10.29	0.82	0.33	14.5	-53.5	Clear	None
15:10	5	250	36.25	0.00	6.85	10.29	0.8	0.34	14.7	-54.6	Clear	None
15:15	5	250	36.25	0.00	6.84	10.29	0.72	0.33	14.7	-55.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	50 mL Glass	3	HCL
VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-03-07			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	25.84	**Total Depth (ft-bmp)**	41	**Water Column(ft)**	15	**Gallons in Well**	2.46
MP Elevation		**Pump Intake (ft-bmp)**	39	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:05	**Volumes Purged**		**Sample ID**	MW-03-07_060820	**Sampled by**	Jacob Pisarkiewicz
Purge Start	09:30	**Gallons Purged**					
Purge End	10:00			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:35		200	26.05	0.00	7.09	1.37	4.56	0.89	16	-76.8	Clear	None
09:40	5	200	26.4	0.00	7.12	1.37	5.43	0.81	16.1	-87.2	Clear	None
09:45	5	200	26.4	0.00	7.14	1.37	3.95	0.69	16	-93.3	Clear	None
09:50	5	200	26.4	0.00	7.19	1.36	1.91	0.62	15.9	-98.2	Clear	None
09:55	5	200	26.4	0.00	7.22	1.34	0.02	0.58	16	-100.2	Clear	None
10:00	5	200	26.4	0.00	7.22	1.34	0.02	0.58	16.1	-100.9	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-03-08			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 93F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.15	**Total Depth (ft-bmp)**	90.01	**Water Column(ft)**	24	**Gallons in Well**	3.88
MP Elevation		**Pump Intake (ft-bmp)**	84.41	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:35	**Volumes Purged**		**Sample ID**	MW-03-08_060920	**Sampled by**	Austin Westhuis
Purge Start	22:10	**Gallons Purged**					
Purge End	10:40			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:15		200	32.96	0.26	6.99	2.03	12.6	0.02	13.5	-74.6	Clear	None
10:20	5	200	32.96	0.53	7.01	2.01	4.58	0.02	13.5	-77.3	Clear	None
10:25	5	200	32.96	0.79	7.01	2.05	2.55	0.02	13.5	-82.1	Clear	None
10:30	5	200	32.96	1.06	7.01	2.05	2.14	0.02	13.4	-82.6	Clear	None
10:35	5	200	32.96	1.32	7.02	2.05	1.78	0.02	13.4	-84.7	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	no
Condition of Well:	Good	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-04-01(6)			**Date**	6/2/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.58	**Total Depth (ft-bmp)**	89.31	**Water Column(ft)**	24	**Gallons in Well**	3.86
MP Elevation		**Pump Intake (ft-bmp)**	80	**Purge Method**	Volumetric	**Sample Method**	Grab
Sample Time	13:30	**Volumes Purged**		**Sample ID**	MW-04-01(6)	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:35		250	65.37	0.00	7.01	0.86	16.8	1.66	17.1	25.7	Clear	None
12:40	5	250	65.4	0.00	7.02	0.83	22.9	9.6	17.2	-17.5	Clear	None
12:50	10	250	65.4	0.00	7.02	0.83	16.7	0.82	16.5	-21.4	Clear	None
12:55	5	250	65.4	0.00	7.03	0.85	41.2	0.74	15.8	-28.5	Clear	None
13:00	5	250	65.4	0.00	7.03	0.89	11.7	0.58	15.5	-35.5	Clear	None
13:05	5	250	65.4	0.00	7.03	0.91	4.49	0.47	15.8	-38.2	Clear	None
13:10	5	250	65.4	0.00	7.03	0.92	0.04	0.39	15.7	-43.3	Clear	None
13:15	5	250	65.4	0.00	7.04	0.92	0.02	0.37	15.5	-45.9	Clear	None
13:21	6	250	65.4	0.00	7.04	0.92	0.02	0.35	15.5	-49.6	Clear	None
13:25	4	250	65.4	0.00	7.04	0.92	0.02	0.35	15.5	-50.1	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1-4 Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-04-04R			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Hot, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	71.2	**Total Depth (ft-bmp)**	113	**Water Column(ft)**	42	**Gallons in Well**	27.17
MP Elevation		**Pump Intake (ft-bmp)**	109	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	12:20	**Volumes Purged**		**Sample ID**	MW-04-04R_060320	**Sampled by**	Jacob Pisarkiewicz
Purge Start	11:30	**Gallons Purged**					
Purge End	12:15			**Replicate/ Code No.**	DUP-11		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:55		200	71.2	0.00	6.97	1.63	3.79	0.78	20	-64.9	Clear	None
12:00	5	200	71.2	0.00	6.96	1.65	1.23	2.53	20.1	-69.3	Clear	None
12:05	5	200	71.2	0.00	6.95	1.65	4.58	2.73	19.7	-61.5	Clear	None
12:10	5	200	71.2	0.00	6.95	1.64	4.88	2.69	19.9	-64.9	Clear	None
12:15	5	200	71.2	0.00	6.97	1.64	3.21	2.65	20.1	-65.5	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None
1,4 dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-04-05(6)			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Hot, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.2	**Total Depth (ft-bmp)**	29.6	**Water Column(ft)**	20	**Gallons in Well**	3.31
MP Elevation		**Pump Intake (ft-bmp)**	26	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	14:40	**Volumes Purged**		**Sample ID**	MW-04-05 (6)_060320	**Sampled by**	Jacob Pisarkiewicz
Purge Start	14:00	**Gallons Purged**					
Purge End	14:35			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:15		200	10.2	0.00	7.24	4.19	0.81	0.43	15	-73.2	Clear	None
14:20	5	200	10.8	0.00	7.24	4.21	1.03	0.39	15.5	-78.1	Clear	None
14:25	5	200	10.8	0.00	7.25	4.28	0.98	0.43	16.2	-83.8	Clear	None
14:30	5	200	10.8	0.00	7.25	4.26	0.78	0.4	16.3	-84.4	Clear	None
14:35	5	200	10.8	0.00	7.25	4.25	0.8	0.43	16.4	-85.6	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-04-06R			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Hot, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC,Steel
Static Water Level (ft-bmp)	59.85	**Total Depth (ft-bmp)**	79.8	**Water Column(ft)**	20	**Gallons in Well**	12.97
MP Elevation		**Pump Intake (ft-bmp)**	76	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	11:00	**Volumes Purged**		**Sample ID**	MW-04-06R_060320	**Sampled by**	Jacob Pisarkiewicz
Purge Start	21:50	**Gallons Purged**					
Purge End	10:55			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:10		200	60.5	0.00	6.96	5.17	23.4	0.36	16.6	115.2	Clear	None
10:15	5	200	60.5	0.00	7.62	5.17	20.2	0.15	16.6	-29.2	Clear	None
10:20	5	200	60.5	0.00	7.66	5.19	20.3	0.12	16.7	-93.4	Clear	None
10:25	5	200	60.5	0.00	7.63	5.2	17.4	0.11	17	-167.3	Clear	None
10:30	5	200	60.5	0.00	7.59	5.24	16.5	0.11	16.3	-231.5	Clear	None
10:35	5	200	60.5	0.00	7.58	5.25	15.5	0.09	16.4	-242.9	Clear	None
10:40	5	200	60.5	0.00	7.6	5.34	11.5	0.11	16.3	-265.3	Clear	None
10:45	5	200	60.5	0.00	7.59	5.34	10.9	0.1	16.5	-270.6	Clear	None
10:50	5	200	60.5	0.00	7.54	5.39	9.54	0.11	16.2	266.5	Clear	None
10:55	5	200	60.5	0.00	7.51	5.4	9.12	0.12	16.1	-264.5	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None
1,4 dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-05(3)			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	0.05	**Total Depth (ft-bmp)**	14.7	**Water Column(ft)**	15	**Gallons in Well**	9.52
MP Elevation		**Pump Intake (ft-bmp)**	12	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:15	**Volumes Purged**		**Sample ID**	MW-05 (3)	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:10		250	0.6	0.00	10.22	0.17	10.8	1.16	20.8	43.5	Clear	None
13:15	5	250	1.1	0.00	10.32	0.18	6.99	1.15	20.6	6.6	Clear	None
13:20	5	250	1.1	0.00	10.69	0.23	14.2	1.6	17.7	-27	Clear	None
13:25	5	250	1.21	0.00	10.54	0.2	7.47	1.38	20.2	-38.4	Clear	None
13:30	5	250	1.46	0.00	10.57	0.2	6.53	1.29	20.2	-40.5	Clear	None
13:35	5	250	2.2	0.00	10.37	0.19	4.47	1.07	20.8	-46.9	Clear	None
13:40	5	250	2.41	0.00	10.22	0.18	4.65	0.97	20.5	-49.6	Clear	None
13:45	5	250	2.82	0.00	10.12	0.17	6.55	0.82	21	-54.3	Clear	None
13:50	5	250	3.38	0.00	10.16	0.18	9.38	1.15	21.3	-59.1	Clear	None
13:55	5	250	3.42	0.00	10.16	0.18	10.6	1.14	21.4	-59.4	Clear	None
14:00	5	250	3.86	0.00	10.15	0.18	9.65	1.25	21.2	-60.1	Clear	None
14:05	5	250	3.86	0.00	10.15	0.18	11.2	1.35	21.2	-60.3	Clear	None
14:10	5	250	4.12	0.00	10.21	0.18	12.2	1.36	21.5	-60.8	Clear	None
14:15	5	250	4.24	0.00	10.22	0.18	12	1.35	21.5	-60.8	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
VOCs	50 mL Glass	3	HCL

Comments: Pumped water out of vault. Water in PVC went to very top. Did best not to get residual vault water in tube

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-01			**Date**	6/5/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 80's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	67.67	**Total Depth (ft-bmp)**	111	**Water Column(ft)**	43	**Gallons in Well**	28.16
MP Elevation		**Pump Intake (ft-bmp)**	108.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:05	**Volumes Purged**	0.04	**Sample ID**	MW-12-01_060520	**Sampled by**	Billy J Cobern
Purge Start	08:25	**Gallons Purged**	1.06				
Purge End	09:05			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:25		100	67.67	0.00							Clear	No
08:30	5	100	67.74	0.13	7.13	1.9	26.7	1.48	15.6	8.9	Clear	No
08:35	5	100	67.77	0.26	7.15	1.9	20.3	0.84	15.2	-14.4	Clear	No
08:40	5	100	67.77	0.40	7.16	1.9	16.8	0.74	15.2	-19.3	Clear	No
08:45	5	100	67.77	0.53	7.16	1.9	15.4	0.7	15.2	-23.6	Clear	No
08:50	5	100	67.77	0.66	7.16	1.9	11.3	0.71	15.3	-29.5	Clear	No
08:55	5	100	67.77	0.79	7.16	1.9	9.92	0.71	15.4	-31	Clear	No
09:00	5	100	67.77	0.92	7.16	1.9	9.67	0.71	15.5	-31.5	Clear	No
09:05	5	100	67.77	1.06	7.16	1.9	9.57	0.69	15.6	-32.4	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	250 mL Amber	1	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-02			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 70's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	58.31	**Total Depth (ft-bmp)**	106	**Water Column(ft)**	48	**Gallons in Well**	31
MP Elevation		**Pump Intake (ft-bmp)**	103.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:50	**Volumes Purged**	0.04	**Sample ID**	MW-12-02_060420	**Sampled by**	Billy J Cobern
Purge Start	14:00	**Gallons Purged**	1.32				
Purge End	14:50			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:00		100	58.31	0.00							Clear	No
14:05	5	100	58.37	0.13	6.99	1.08	188	2.21	26.3	-38.6	Clear	No
14:10	5	100	58.37	0.26	6.94	1.16	161	1.45	28.2	-65.3	Clear	No
14:15	5	100	58.37	0.40	6.94	1.2	147	1.37	29.5	-71.3	Clear	No
14:20	5	100	58.37	0.53	6.94	1.2	123	1.35	30.3	-75.3	Clear	No
14:25	5	100	58.37	0.66	6.93	1.2	104	1.33	30.5	-78.1	Clear	No
14:30	5	100	58.37	0.79	6.93	1.24	81.1	1.63	26.5	-78.3	Clear	No
14:35	5	100	58.37	0.92	6.94	1.23	94	1.66	24.4	-73.7	Clear	No
14:40	5	100	58.37	1.06	6.95	1.21	92.7	1.46	24.1	-69	Clear	No
14:45	5	100	58.37	1.19	6.95	1.21	91.2	1.42	24.2	-68.7	Clear	No
14:50	5	100	58.37	1.32	6.95	1.21	93.4	1.42	14.2	-68.4	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	250 mL Amber	1	HCL

Comments: All parameters stable, but turbidity was above 10 NTU

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-05R			**Date**	6/5/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 70's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	66.81	**Total Depth (ft-bmp)**	117.01	**Water Column(ft)**	50	**Gallons in Well**	32.63
MP Elevation		**Pump Intake (ft-bmp)**	114.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:20	**Volumes Purged**	0.04	**Sample ID**	MW-12-05R	**Sampled by**	Billy J Cobern
Purge Start	09:30	**Gallons Purged**	1.32				
Purge End	10:20			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:30		100	66.81	0.00							Clear	No
09:35	5	100	66.81	0.13	8.19	1.52	123	7.44	19.6	-11.4	Clear	No
09:40	5	100	66.81	0.26	7.62	1.55	53.4	7.09	19.7	-83.1	Clear	No
09:45	5	100	66.81	0.40	7.23	1.64	50.2	6.97	19.3	-108.1	Clear	No
09:50	5	100	66.81	0.53	7.19	1.64	20.3	6.43	19.9	-143.3	Clear	No
09:55	5	100	66.81	0.66	7.18	1.64	17.9	6.18	19.7	-164.4	Clear	No
10:00	5	100	66.81	0.79	7.16	1.63	15.9	5.84	20	-172.2	Clear	No
10:05	5	100	66.81	0.92	7.15	1.65	14.5	5.67	20.3	-174.9	Clear	No
10:10	5	100	66.81	1.06	7.16	1.65	13.2	5.64	20	-176.4	Clear	No
10:15	5	100	66.81	1.19	7.18	1.66	13.1	5.76	19.8	-177	Clear	No
10:20	5	100	66.81	1.32	7.19	1.66	13.4	5.68	19.7	-177.8	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	250 mL Amber	1	HCL

Comments: All parameters stablized, but turbidity was above 10 NTU

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-06			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 80's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	65.52	**Total Depth (ft-bmp)**	104.5	**Water Column(ft)**	39	**Gallons in Well**	25.34
MP Elevation		**Pump Intake (ft-bmp)**	102	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	17:18	**Volumes Purged**	0.05	**Sample ID**	MW-12-06_060420	**Sampled by**	Billy J Cobern
Purge Start	16:45	**Gallons Purged**	1.32				
Purge End	17:35			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
16:45		100	65.52	0.00							Clear	No
16:50	5	100	65.58	0.13	7.52	0.75	57.3	6.8	25.2	-100.3	Clear	No
16:55	5	100	65.58	0.26	7.4	0.81	48.6	7.27	23.6	-90.2	Clear	No
17:00	5	100	65.58	0.40	7.33	0.88	37.1	5.8	26.2	-128.8	Clear	No
17:05	5	100	65.58	0.53	7.33	0.91	25.6	5.73	26	-139.8	Clear	No
17:10	5	100	65.58	0.66	7.33	0.91	17.2	5.68	25.6	-144.3	Clear	No
17:15	5	100	65.58	0.79	7.34	0.91	12.6	5.46	25.5	-149.3	Clear	No
17:20	5	100	65.58	0.92	7.34	0.91	10.2	5.45	25.3	-151.1	Clear	No
17:25	5	100	65.58	1.06	7.34	0.92	9.88	5.52	24.9	-152.3	Clear	No
17:30	5	100	65.58	1.19	7.34	0.92	9.77	5.56	24.7	-152.8	Clear	No
17:35	5	100	65.58	1.32	7.34	0.92	9.68	5.51	24.8	-152.7	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	250 mL Amber	1	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-09			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.6	**Total Depth (ft-bmp)**	21.6	**Water Column(ft)**	8	**Gallons in Well**	1.3
MP Elevation		**Pump Intake (ft-bmp)**	19	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:00	**Volumes Purged**		**Sample ID**	MW-12-09_060820	**Sampled by**	Jacob Pisarkiewicz
Purge Start	00:00	**Gallons Purged**					
Purge End	12:55			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:05		200	13.61	0.00	6.86	2.65	105	0.33	16.8	-26.6	Clear	None
12:10	5	200	13.61	0.00	6.84	2.44	107	0.25	16.8	-33.6	Clear	None
12:15	5	200	13.61	0.00	6.89	2.35	88.2	0.2	17	-41.6	Clear	None
12:20	5	200	13.61	0.00	6.9	2.32	63.1	0.2	17	-42.8	Clear	None
12:25	5	200	13.61	0.00	6.9	2.3	45.5	0.17	17	-44.6	Clear	None
12:30	5	200	13.61	0.00	6.9	2.29	39.9	0.16	17	-44.6	Clear	None
12:35	5	200	13.61	0.00	6.91	2.28	22.7	0.21	17.4	-45.6	Clear	None
12:40	5	200	13.61	0.00	6.91	2.28	15.2	0.2	17	-44.5	Clear	None
12:45	5	200	13.61	0.00	6.91	2.27	10.2	0.21	17.5	-45.5	Clear	None
12:50	5	200	13.61	0.00	6.91	2.28	9.55	20	17.5	-45.9	Clear	None
12:55	5	200	13.61	0.00	6.92	2.28	8.89	0.21	17.4	-46	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
VOCs	40 mL Glass	3	HCL
1,4-Dioxane	40 mL Glass	0	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-09			**Date**	12/04/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	40 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.26	**Total Depth (ft-bmp)**	21.6	**Water Column(ft)**	7.34	**Gallons in Well**	1.19
MP Elevation		**Pump Intake (ft-bmp)**	19.1	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:15	**Volumes Purged**	0.67	**Sample ID**	MW-12-09_120420	**Sampled by**	Austin Westhuis
Purge Start	12:50	**Gallons Purged**	0.79	**Replicate/ Code No.**			
Purge End	13:20						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:55	0	0	100	14.26	0.13	6.94	2.08	2.86	0.47	13.3	-42.6	--	--
13:00	5	5	100	14.26	0.26	7.03	1.93	1.69	0.16	14.1	-46.8	--	--
13:05	5	10	100	14.26	0.40	7.1	1.74	1.5	0.1	14.1	-51.7	--	--
13:10	5	15	100	14.26	0.53	7.14	1.72	1.37	0.1	14.1	-53	--	--
13:15	5	20	100	14.26	0.66	7.16	1.7	1.22	0.1	14.1	-53.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-11			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Hot, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.28	**Total Depth (ft-bmp)**	16.8	**Water Column(ft)**	14	**Gallons in Well**	2.2
MP Elevation		**Pump Intake (ft-bmp)**	14	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	12:55	**Volumes Purged**		**Sample ID**	MW-12-11_060420	**Sampled by**	Jacob Pisarkiewicz
Purge Start	12:10	**Gallons Purged**					
Purge End	12:45			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:20		200	4.35	0.00	6.76	5.83	17.6	0.71	13	-77.6	Clear	None
12:25	5	200	4.6	0.00	6.54	5.6	4.33	0.55	12.9	-79.2	Clear	None
12:30	5	200	4.6	0.00	6.58	5.55	2.33	0.5	12.8	-78.9	Clear	None
12:35	5	200	4.6	0.00	6.78	5.43	2.22	0.52	12.8	-76.8	Clear	None
12:40	5	200	4.6	0.00	6.78	5.39	1.93	0.56	12.6	-75.6	Clear	None
12:45	5	200	4.6	0.00	6.77	5.33	0.02	0.51	12.6	-72.3	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-12-12			**Date**	3/3/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	6.88	**Total Depth (ft-bmp)**	17.2	**Water Column(ft)**	10.32	**Gallons in Well**	1.68
MP Elevation	NA	**Pump Intake (ft-bmp)**	15.2	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	16:25	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	15:50						
Purge End:	16:30						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:55	0	200	8.44	0.26	7.98	0.428	3.18	0.49	8.6	99.4	Clear	None
16:00	5	200	9.36	0.53	7.93	0.429	2.93	0.15	8.6	101.9	Clear	None
16:05	5	200	9.63	0.79	7.89	0.439	2.39	0.29	8.5	102.8	Clear	None
16:10	5	200	9.63	1.06	7.85	0.465	1.97	0.23	8.5	102.4	Clear	None
16:15	5	200	9.63	1.32	7.81	0.484	1.55	0.17	8.6	103.4	Clear	None
16:20	5	200	9.63	1.59	7.8	0.487	1.25	0.15	8.5	104	Clear	None
16:25	5	200	9.63	1.85	7.78	0.489	1.02	0.14	8.5	104.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: no

Well Locked at Departure: no

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-12			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Hot, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.45	**Total Depth (ft-bmp)**	17.2	**Water Column(ft)**	12	**Gallons in Well**	1.91
MP Elevation		**Pump Intake (ft-bmp)**	15	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	15:35	**Volumes Purged**		**Sample ID**	MW-12-12_060320	**Sampled by**	Jacob Pisarkiewicz
Purge Start	15:00	**Gallons Purged**					
Purge End	15:30			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:04		200	6.5	0.00	7.71	0.5	2.82	0.44	17.6	-44.4	Clear	None
15:10	6	200	7.11	0.00	7.65	0.49	11.4	0.35	18.4	-41.2	Clear	None
15:15	5	200	7.11	0.00	7.64	0.51	13.1	0.39	18.5	-37.5	Clear	None
15:20	5	200	7.11	0.00	7.59	0.53	11.3	0.37	18.2	-34.8	Clear	None
15:25	5	200	7.11	0.00	7.6	0.56	10.9	0.35	18	-32.8	Clear	None
15:30	5	200	7.11	0.00	7.59	0.59	10.1	0.34	17.9	-31.1	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-12			**Date**	08/31/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	63.0 degrees F and Clear. The wind is blowing SE at 37.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	8.09	**Total Depth (ft-bmp)**	17.19	**Water Column(ft)**	9.1	**Gallons in Well**	1.48
MP Elevation		**Pump Intake (ft-bmp)**	14.69	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:25	**Volumes Purged**		**Sample ID**	MW-12-12_083120	**Sampled by**	Austin Westhuis
Purge Start	09:50	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	10:30						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:55	0	0	100	8.76	0.13	6.78	2.39	3.93	0.5	18.2	62.3	--	--
10:00	5	5	100	9.35	0.26	7.26	1.4	1.77	0.19	18.1	4.3	--	--
10:05	5	10	100	9.82	0.40	7.41	0.76	1.56	0.13	18	-22.4	--	--
10:10	5	15	100	10.29	0.53	7.41	0.66	1.5	0.12	18	-39.8	--	--
10:15	5	20	100	10.39	0.66	7.41	0.62	1.32	0.11	17.9	-43.3	--	--
10:20	5	25	100	10.45	0.79	7.41	0.61	1.22	0.11	17.9	-45.6	--	--
10:25	5	30	100	10.53	0.92	7.42	0.61	1.13	0.1	17.9	-47	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-12			**Date**	12/02/2020
Project Name/Location	RACER Lansing/ Lansing, MI		**Weather(°F)**	30.9 degrees F and Clear. The wind is blowing W at 37.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	8.27	**Total Depth (ft-bmp)**	17.2	**Water Column(ft)**	8.93	**Gallons in Well**	1.45
MP Elevation		**Pump Intake (ft-bmp)**	15	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:15	**Volumes Purged**	0.82	**Sample ID**	MW-12-12_120220	**Sampled by**	Billy Cobern
Purge Start	09:30	**Gallons Purged**	1.19	**Replicate/ Code No.**			
Purge End	10:20						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:30	0	0	100	8.27	0.00							--	--
09:35	5	5	100	8.98	0.13	7.96	0.516	8.32	1.09	11.8	51.4	--	--
09:40	5	10	100	9.61	0.26	7.6	0.67	7.34	0.65	12.9	64.6	--	--
09:45	5	15	100	10.03	0.40	7.45	0.73	6.82	0.6	12.9	58.9	--	--
09:50	5	20	100	10.49	0.53	7.59	0.646	6.35	0.48	12.9	48.7	--	--
09:55	5	25	100	10.91	0.66	7.67	0.622	6.06	0.46	12.9	51.2	--	--
10:00	5	30	100	11.39	0.79	7.64	0.637	5.87	0.43	13.1	50.1	--	--
10:05	5	35	100	11.79	0.92	7.63	0.629	5.62	0.4	13.1	47.5	--	--
10:10	5	40	100	12.20	1.06	7.68	0.626	5.45	0.37	13.1	45.6	--	--
10:15	5	45	100	12.54	1.19	7.68	0.621	5.32	0.37	13.2	46.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 6

Well Locked at Arrival: no

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-12-13			**Date**	3/4/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	9.49	**Total Depth (ft-bmp)**	25.5	**Water Column(ft)**	16.01	**Gallons in Well**	2.6
MP Elevation	NA	**Pump Intake (ft-bmp)**	23.5	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	10:00	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	09:15						
Purge End:	10:05						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:20	0	200	9.54	0.26	7.49	0.75	5.91	2.63	8.6	205.2	Clear	None
09:25	5	200	9.54	0.53	7.59	0.75	2.49	2.31	8.9	197.3	Clear	None
09:30	5	200	9.54	0.79	7.58	0.75	2.13	2.04	8.9	196.5	Clear	None
09:35	5	200	9.54	1.06	7.56	0.74	1.8	1.63	9.1	188.2	Clear	None
09:40	5	200	9.54	1.32	7.52	0.72	1.59	1.3	9	164	Clear	None
09:45	5	200	9.54	1.59	7.52	0.72	1.52	1.11	9.1	146.5	Clear	None
09:50	5	200	9.54	1.85	7.52	0.71	1.28	0.9	9.2	129.7	Clear	None
09:55	5	200	9.54	2.11	7.5	0.68	1.24	0.87	9.2	125.6	Clear	None
10:00	5	200	9.54	2.38	7.5	0.66	1.2	0.85	9.2	121.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-13			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Hot, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.9	**Total Depth (ft-bmp)**	25.5	**Water Column(ft)**	16	**Gallons in Well**	2.53
MP Elevation		**Pump Intake (ft-bmp)**	23	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	09:25	**Volumes Purged**		**Sample ID**	MW-12-13_060420	**Sampled by**	Jacob Pisarkiewicz
Purge Start	20:45	**Gallons Purged**					
Purge End	09:20			**Replicate/ Code No.**	Dup-10		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:50		200	10.75	0.00	7.2	1.09	3.53	0.69	13.7	147.6	Clear	None
08:55	5	200	11.1	0.00	7.23	1.05	2.59	0.39	13.5	106.5	Clear	None
09:00	5	200	11.1	0.00	7.24	1.02	2.13	0.34	13.7	49.4	Clear	None
09:05	5	200	11.1	0.00	7.25	1	3.12	0.28	13.9	6.8	Clear	None
09:10	5	200	11.1	0.00	7.27	0.99	0.02	0.26	13.4	-18.9	Clear	None
09:15	5	200	11.1	0.00	7.26	0.99	0.02	0.25	13.5	-20.1	Clear	None
09:20	5	200	11.1	0.00	7.26	0.99	0.02	0.27	13.6	-22.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
Metals	250 mL Plastic	1	HNO3

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-13			**Date**	08/31/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	76 °F, Sunny, S winds at 9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.74	**Total Depth (ft-bmp)**	25.42	**Water Column(ft)**	13.68	**Gallons in Well**	2.22
MP Elevation		**Pump Intake (ft-bmp)**	22.92	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:25	**Volumes Purged**		**Sample ID**	MW-12-13_083120	**Sampled by**	Austin Westhuis
Purge Start	11:55	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:30						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:00	0	0	100	12.58	0.13	7.34	0.75	20.5	0.09	16.4	-87.9	--	--
12:05	5	5	100	12.66	0.26	7.35	0.74	12.8	0.08	16.3	-99.3	--	--
12:10	5	10	100	12.88	0.40	7.37	0.73	5.73	0.08	16.1	-113.5	--	--
12:15	5	15	100	12.92	0.53	7.38	0.73	3.12	0.07	16	-118	--	--
12:20	5	20	100	12.96	0.66	7.38	0.72	2.89	0.07	16	-119.1	--	--
12:25	5	25	100	12.99	0.79	7.38	0.72	2.62	0.07	15.9	-119.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-13			**Date**	12/02/2020
Project Name/Location	RACER Lansing/ Lansing, MI		**Weather(°F)**	37.0 degrees F and Clear. The wind is blowing W at 41.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.85	**Total Depth (ft-bmp)**	25.45	**Water Column(ft)**	14.6	**Gallons in Well**	2.37
MP Elevation		**Pump Intake (ft-bmp)**	23	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:10	**Volumes Purged**	0.28	**Sample ID**	MW-12-13	**Sampled by**	Billy Cobern
Purge Start	11:45	**Gallons Purged**	0.66	**Replicate/ Code No.**			
Purge End	12:15						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:45	0	0	100	10.85	0.00							--	--
11:50	5	5	100	11.39	0.13	7.45	0.89	7.89	4.68	12.3	37.6	--	--
11:55	5	10	100	11.52	0.26	7.36	0.88	8.42	4.01	12.2	40.5	--	--
12:00	5	15	100	11.67	0.40	7.35	0.87	7.98	4.15	12.3	40.6	--	--
12:05	5	20	100	11.77	0.53	7.35	0.87	7.67	4.15	12.4	40.7	--	--
12:10	5	25	100	11.86	0.66	7.32	0.87	7.42	4.11	12.4	40.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-18			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.8	**Total Depth (ft-bmp)**	35	**Water Column(ft)**	12	**Gallons in Well**	1.98
MP Elevation		**Pump Intake (ft-bmp)**	33	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:35	**Volumes Purged**		**Sample ID**	MW-12-18_060820	**Sampled by**	Jacob Pisarkiewicz
Purge Start	10:55	**Gallons Purged**					
Purge End	11:30			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:00		200	22.8	0.00	7.04	2.23	48.5	0.69	15.3	39.2	Clear	None
11:05	5	200	23.5	0.00	7	2.22	44.6	0.36	14.9	18.3	Clear	None
11:10	5	200	23.8	0.00	7.02	2.23	36.5	0.28	15.2	-1.3	Clear	None
11:15	5	200	23.8	0.00	7.03	2.23	34.5	0.27	15.1	-6.7	Clear	None
11:20	5	200	23.8	0.00	7.06	2.42	20.3	0.25	15.4	-16.6	Clear	None
11:25	5	200	23.8	0.00	7.06	2.24	19.5	0.23	15.4	-17.8	Clear	None
11:30	5	200	23.8	0.00	7.06	2.24	18.8	0.24	15.4	-18.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-18			**Date**	12/04/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	40 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	23.72	**Total Depth (ft-bmp)**	34.85	**Water Column(ft)**	11.13	**Gallons in Well**	1.81
MP Elevation		**Pump Intake (ft-bmp)**	32.35	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:05	**Volumes Purged**	0.51	**Sample ID**	MW-12-18_120420	**Sampled by**	Austin Westhuis
Purge Start	10:35	**Gallons Purged**	0.92	**Replicate/ Code No.**	Not Applicable		
Purge End	11:15						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:40	0	0	100	24.75	0.13	6.77	1.62	3.83	0.31	11.4	-64.4	--	--
10:45	5	5	100	25.07	0.26	6.92	1.64	1.88	0.32	11	-58.9	--	--
10:50	5	10	100	25.09	0.40	6.95	1.62	1.29	0.26	10.9	-57.9	--	--
10:55	5	15	100	25.09	0.53	6.96	1.6	1.2	0.32	10.9	-57.4	--	--
11:00	5	20	100	25.09	0.66	6.96	1.61	1.07	0.31	10.9	-57.2	--	--
11:05	5	25	100	25.09	0.79	6.97	1.62	1.02	0.29	11	-57.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-20			**Date**	6/10/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	59.85	**Total Depth (ft-bmp)**	80.5	**Water Column(ft)**	21	**Gallons in Well**	3.36
MP Elevation		**Pump Intake (ft-bmp)**	78	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:15	**Volumes Purged**		**Sample ID**	MW-12-20_061020	**Sampled by**	Jacob Pisarkiewicz
Purge Start	13:35	**Gallons Purged**					
Purge End	14:10			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:50		200	60.25	0.00	6.82	1.53	17.8	0.43	20.1	-79.8	Clear	None
13:55	5	200	60.25	0.00	6.85	1.54	17	0.42	17.2	-79.2	Clear	None
14:00	5	200	60.25	0.00	6.85	1.53	16.3	0.37	17.6	-79.6	Clear	None
14:05	5	200	60.25	0.00	6.86	1.53	16.5	0.34	17.2	-78.8	Clear	None
14:10	5	200	60.25	0.00	6.86	1.54	16.1	0.33	16.6	-78.9	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-12-21			**Date**	6/11/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	61.25	**Total Depth (ft-bmp)**	78.75	**Water Column(ft)**	18	**Gallons in Well**	2.84
MP Elevation		**Pump Intake (ft-bmp)**	76	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:00	**Volumes Purged**		**Sample ID**	MW-12-21_061020	**Sampled by**	Jacob Pisarkiewicz
Purge Start	08:15	**Gallons Purged**					
Purge End	08:55			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:25		200	62	0.00	6.76	1.42	50.7	0.69	14.2	-52	Clear	None
08:30	5	200	62.6	0.00	6.79	1.42	63.3	0.62	14.2	-56.9	Clear	None
08:35	5	200	62.6	0.00	6.81	1.42	63.3	0.59	14.5	-60.9	Clear	None
08:40	5	200	62.6	0.00	6.83	1.42	64.9	0.56	14.6	-61.6	Clear	None
08:45	5	200	62.6	0.00	6.84	1.42	60.2	0.6	14.5	-61.6	Clear	None
08:50	5	200	62.6	0.00	6.85	1.41	58.9	0.63	14.5	-60.9	Clear	None
08:55	5	200	62.6	0.00	6.85	1.41	57.5	0.62	14.5	-60.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Glass	3	HCL
VOCs	40 mL Glass	0	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-12-21			**Date**	12/8/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cold, overcast
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	62.45	**Total Depth (ft-bmp)**	75	**Water Column(ft)**	12.55	**Gallons in Well**	2.04
MP Elevation	NA	**Pump Intake (ft-bmp)**	72	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	11:40	**Gallons Purged**		**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	10:25						
Purge End:	11:35						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:40	0	200	64.35	0.00	6.83	1.41	10.3	0.92	11.4	-32.4	Clear	None
10:45	5	200	64.35	0.00	6.89	1.4	4.59	0.69	11.7	-38.2	Clear	None
10:50	5	200	64.35	0.00	6.93	1.4	3.5	0.7	11.9	-41.1	Clear	None
10:55	5	200	64.35	0.00	7	1.35	3.78	0.88	10.2	-36.5	Clear	None
11:00	5	200	64.35	0.00	6.9	1.46	26.6	0.32	12.5	-57.7	Clear	None
11:05	5	200	64.35	0.00	6.91	1.48	86	0.19	12.6	-61.4	Clear	None
11:10	5	200	64.35	0.00	6.93	1.47	121	0.14	12.2	-64.9	Clear	None
11:15	5	200	64.35	0.00	6.88	1.44	94	0.14	12.2	-60.6	Clear	None
11:20	5	200	64.35	0.00	6.89	1.42	83.6	0.18	12.2	-57.7	Clear	None
11:25	5	200	64.35	0.00	6.9	1.41	88.4	0.2	12.3	-54.4	Clear	None
11:30	5	200	64.35	0.00	6.9	1.42	87.1	0.21	12.3	-53.8	Clear	None
11:35	5	200	64.35	0.00	6.9	1.41	91.1	0.2	12.2	-52.3	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

2020-03-03, MW-13-22

Created	2020-03-03 19:06:51 UTC by Jake Pisarkiewicz
Updated	2020-03-03 19:52:36 UTC by Jake Pisarkiewicz
Location	42.7423553774531, -84.5886361040963
Project Number	30006870
Project Name / Location	RACER Lansing, MI
Sampler Name	Jake Pisarkiewicz
Date	2020-03-03
Well ID	MW-13-22
Are you able to purge and/or sample this well? If not, explain why in the Comments section below.	Yes
Replicate No. (e.g. Dup)	MS/MSD
Weather	Cool, windy, overcast

Evacuation Details

Measuring Point (mp) Description	Top of Casing
Casing Diameter (inches)	2
Static Water Level (ft-bmp)	62.49
Total Depth (ft-bmp)	96
Water Column	33.51
Gallons in Well	5.45

Reference Note: Well Volume Calculation [$\pi r^2 h$, where h= 1foot] Well radius (inch):Volume (Gal./foot):Volume (mL/foot) 0.5" = 0.04 gal/ft = 154 mL/ft 1" = 0.16 gal/ft = 617 mL/ft 2" = 0.65 gal/ft = 2470 mL/ft 3" = 1.47 gal/ft = 5557 mL/ft

Purge Method	Low-Flow
Type of Equipment used	Bladder
Sample Method	Grab
Sample Depth (ft-bmp) (e.g. pump intake)	92
Purge Start	14:20

@14:25, DTW:62.5, pH:6.81, temp:11.7, cond:1.92, turb:6.27, DO:0.5, redox:-20.1

Reading Time	14:25
Rate (mL/min)	50
Depth to Water (ft)	62.5
pH	6.81
Conductivity (mS/cm)	1.92
Turbidity (NTU)	6.27
Dissolved Oxygen (mg/L)	0.5
Temperature (Degrees Celsius)	11.7
Redox (ORP mV)	-20.1
parameters	@14:25, DTW:62.5, pH:6.81, temp:11.7, cond:1.92, turb:6.27, DO:0.5, redox:-20.1

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -Turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -Specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

@14:30, DTW:62.5, pH:6.81, temp:12.1, cond:1.95, turb:23.7, DO:0.46, redox:-35.2

Reading Time	14:30
Minutes Elapsed between readings	5
Rate (mL/min)	50

Depth to Water (ft)	62.5
pH	6.81
Conductivity (mS/cm)	1.95
Turbidity (NTU)	23.7
Dissolved Oxygen (mg/L)	0.46
Temperature (Degrees Celsius)	12.1
Redox (ORP mV)	-35.2
parameters	@14:30, DTW:62.5, pH:6.81, temp:12.1, cond:1.95, turb:23.7, DO:0.46, redox:-35.2

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -Turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -Specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

@14:35, DTW:62.5, pH:6.82, temp:11.6, cond:1.97, turb:24.2, DO:0.29, redox:-40.1

Reading Time	14:35
Minutes Elapsed between readings	5
Rate (mL/min)	50
Depth to Water (ft)	62.5
pH	6.82
Conductivity (mS/cm)	1.97
Turbidity (NTU)	24.2
Dissolved Oxygen (mg/L)	0.29
Temperature (Degrees Celsius)	11.6
Redox (ORP mV)	-40.1
parameters	@14:35, DTW:62.5, pH:6.82, temp:11.6, cond:1.97, turb:24.2, DO:0.29, redox:-40.1

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -Turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -Specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

@14:40, DTW:62.5, pH:6.82, temp:11.5, cond:1.97, turb:27.6, DO:0.25, redox:-41.7

Reading Time	14:40
Minutes Elapsed between readings	5
Rate (mL/min)	50
Depth to Water (ft)	62.5
pH	6.82
Conductivity (mS/cm)	1.97
Turbidity (NTU)	27.6
Dissolved Oxygen (mg/L)	0.25
Temperature (Degrees Celsius)	11.5
Redox (ORP mV)	-41.7
parameters	@14:40, DTW:62.5, pH:6.82, temp:11.5, cond:1.97, turb:27.6, DO:0.25, redox:-41.7

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -Turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -Specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

@14:45, DTW:62.5, pH:6.82, temp:11.4, cond:1.98, turb:24.1, DO:0.25, redox:-44.1

Reading Time	14:45
Minutes Elapsed between readings	5
Rate (mL/min)	50
Depth to Water (ft)	62.5

pH	6.82
Conductivity (mS/cm)	1.98
Turbidity (NTU)	24.1
Dissolved Oxygen (mg/L)	0.25
Temperature (Degrees Celsius)	11.4
Redox (ORP mV)	-44.1
parameters	@14:45, DTW:62.5, pH:6.82, temp:11.4, cond:1.98, turb:24.1, DO:0.25, redox:-44.1
Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -Turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -Specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit	

@14:50, DTW:62.5, pH:6.82, temp:11.7, cond:1.98, turb:23.3, DO:0.23, redox:-44.9

Reading Time	14:50
Minutes Elapsed between readings	5
Rate (mL/min)	50
Depth to Water (ft)	62.5
pH	6.82
Conductivity (mS/cm)	1.98
Turbidity (NTU)	23.3
Dissolved Oxygen (mg/L)	0.23
Temperature (Degrees Celsius)	11.7
Redox (ORP mV)	-44.9
parameters	@14:50, DTW:62.5, pH:6.82, temp:11.7, cond:1.98, turb:23.3, DO:0.23, redox:-44.9
Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -Turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -Specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit	
Purge End	14:55

Sample Information

Sample Time	15:00
Color	Clear
Notable odors	None

1,4-Dioxane

Constituent Sampled	1,4-Dioxane
Container Type	40 mL Vial
Number of Containers	3
Preservative	HCL

Well Information

Well Location	Plant 3
Condition of Well	Good
Well Locked at Arrival	Yes
Well Locked at Departure	Yes

Signature

Signed 2020-03-03 19:08:43 UTC

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-22			**Date**	6/11/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Stainless Steel
Static Water Level (ft-bmp)	62.2	**Total Depth (ft-bmp)**	98	**Water Column(ft)**	36	**Gallons in Well**	5.82
MP Elevation		**Pump Intake (ft-bmp)**	91	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:45	**Volumes Purged**		**Sample ID**	MW-13-22	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:35		250	62.3	0.00	6.93	1.91	19.2	0.96	14.5	-53	Clear	None
08:40	5	250	62.3	0.00	6.94	1.91	3.81	0.7	14.2	-65.9	Clear	None
08:45	5	250	62.3	0.00	6.95	1.91	4.58	0.66	14.1	-67.9	Clear	None
08:50	5	250	62.3	0.00	6.96	1.9	4.45	0.48	14	-73	Clear	None
08:55	5	250	62.3	0.00	6.96	1.9	4.07	0.39	14	-77	Clear	None
09:00	5	250	62.3	0.00	6.96	1.9	4.7	0.36	14.1	-80.4	Clear	None
09:05	5	250	62.3	0.00	6.96	1.91	4.43	0.29	14.1	-84.4	Clear	None
09:10	5	250	62.3	0.00	6.96	1.9	4.64	0.29	14.2	-84.5	Clear	None
09:15	5	250	62.3	0.00	6.95	1.92	33.6	0.26	14.1	-84.5	Clear	None
09:20	5	250	62.3	0.00	6.95	1.94	56.5	0.26	14.2	-84.3	Clear	None
09:25	5	250	62.3	0.00	6.95	1.94	53.3	0.26	14.1	-84.3	Clear	None
09:30	5	250	62.3	0.00	6.96	1.93	51	0.24	14.2	-84.2	Clear	None
09:35	5	250	62.3	0.00	6.96	1.94	57.9	0.75	14.1	-85	Clear	None
09:40	5	250	62.3	0.00	6.95	1.94	58.7	0.59	14.2	-85.6	Clear	None
09:37	1437	250	62.3	0.00	6.95	1.94	76.6	0.47	14.2	-85.4	Clear	None

Constituent Sampled	Container	Number	Preservative
VOCs	50 mL Glass	3	HCL
1,4-Dioxane	50 mL Glass	0	HCL

Comments: Unstable well

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-22			**Date**	08/27/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**	84.0 degrees F and Clear. The wind is blowing W at 62.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.98	**Total Depth (ft-bmp)**	96.15	**Water Column(ft)**	31.17	**Gallons in Well**	5.06
MP Elevation		**Pump Intake (ft-bmp)**	92	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:55	**Volumes Purged**	0.29	**Sample ID**	MW-13-22_082720	**Sampled by**	Billy Cobern
Purge Start	12:00	**Gallons Purged**	1.45	**Replicate/ Code No.**			
Purge End	13:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:00	0	0	100	64.98	0.00							--	--
12:05	5	5	100	65.05	0.13	7.13	2.02	19.3	3.79	26.3	61.7	--	--
12:10	5	10	100	65.05	0.26	6.9	1.94	14.1	3.11	22.9	-12.7	--	--
12:15	5	15	100	65.05	0.40	6.88	1.92	11.3	2.04	22.7	-33.4	--	--
12:20	5	20	100	65.05	0.53	6.88	1.91	9.89	1.78	22.7	-40.1	--	--
12:25	5	25	100	65.05	0.66	6.87	1.9	8.67	1.68	22.4	-41.8	--	--
12:30	5	30	100	65.05	0.79	6.87	1.9	7.62	1.66	21.3	-41.8	--	--
12:35	5	35	100	65.05	0.92	6.87	1.89	6.12	1.61	21.3	-42.1	--	--
12:40	5	40	100	65.05	1.06	6.87	1.89	5.01	1.6	21.3	-42.2	--	--
12:45	5	45	100	65.05	1.19	6.87	1.89	4.86	1.57	21.3	-42.4	--	--
12:50	5	50	100	65.05	1.32	6.87	1.89	4.41	1.57	21.4	-42.5	--	--
12:55	5	55	100	65.05	1.45	6.87	1.89	3.97	1.52	21.4	-42.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL

Comments: O2=20.9, CO=0, H2S=0, LEL=0, PID=0

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-22			**Date**	12/01/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.61	**Total Depth (ft-bmp)**	96.15	**Water Column(ft)**	29.54	**Gallons in Well**	4.8
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:05	**Volumes Purged**		**Sample ID**	MW-13-22	**Sampled by**	Donald Richmond
Purge Start	13:25	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	14:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:35	0	0	100	64.16	--	6.85	1.17	126	7.03	3.4	-4	--	--
13:40	5	5	100	64.16	--	6.82	1.18	282	5.18	3.2	-16.9	--	--
13:45	5	10	100	64.16	--	6.81	1.17	383	4.94	3.2	-21.2	--	--
13:50	5	15	100	64.16	--	6.81	1.19	483	4.72	3.3	-22.5	--	--
13:55	5	20	100	64.16	--	6.81	1.18	614	4.33	2.9	-24.2	--	--
14:00	5	25	100	64.16	--	6.81	1.17	665	4.04	2.5	-25.2	--	--
14:05	5	30	100	64.16	--	6.81	1.17	637	3.55	2.4	-25.9	Gray	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-23			**Date**	6/11/2020
Project Name/Location	RACER Lansing					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Stainless Steel
Static Water Level (ft-bmp)	64.01	**Total Depth (ft-bmp)**	79.1	**Water Column(ft)**	15	**Gallons in Well**	2.45
MP Elevation		**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:25	**Volumes Purged**		**Sample ID**	MW-13-23	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:20		250	64.01	0.00	6.59	2.32	1100	1.78	15.2	58.6	Clear	None
10:25	5	250	64.01	0.00	6.61	2.31	1100	0.47	15	55	Clear	None
10:30	5	250	64.52	0.00	6.6	2.3	1100	0.37	15.1	54.2	Clear	None
10:35	5	250	64.52	0.00	6.61	2.3	305	0.33	15.6	51.7	Clear	None
10:40	5	250	64.52	0.00	6.58	2.3	241	0.22	15.3	51.6	Clear	None
10:45	5	250	64.52	0.00	6.58	2.3	131	0.2	15.4	51.9	Clear	None
10:50	5	250	64.52	0.00	6.59	2.29	68	0.19	15.6	52.1	Clear	None
10:55	5	250	64.52	0.00	6.59	2.3	49.7	0.17	15.6	52.2	Clear	None
11:00	5	250	64.52	0.00	6.59	2.29	88.4	0.17	15.5	52.6	Clear	None
11:05	5	250	64.52	0.00	6.6	2.29	76.9	0.16	15.6	52.8	Clear	None
11:10	5	250	64.52	0.00	6.6	2.29	52.8	0.16	15.6	53	Clear	None
11:15	5	250	64.52	0.00	6.6	2.29	46.8	0.16	15.5	53.6	Clear	None
11:20	5	250	64.52	0.00	6.61	2.29	40	0.15	15.6	53.3	Clear	None
11:25	5	250	64.52	0.00	6.61	2.3	35.7	0.8	15.7	54.7	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	50 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-24			**Date**	6/10/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Cloudy, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Stainless Steel
Static Water Level (ft-bmp)	59.27	**Total Depth (ft-bmp)**	78	**Water Column(ft)**	19	**Gallons in Well**	3.04
MP Elevation		**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:55	**Volumes Purged**		**Sample ID**	MW-13-24	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:50		250	59.27	0.00	6.98	1.02	15.7	2.7	18.4	-69.7	Clear	None
12:55	5	250	59.27	0.00	6.98	1	12.1	0.72	17	-74.4	Clear	None
13:00	5	250	59.27	0.00	6.98	0.97	8.03	0.95	16.9	-72.8	Clear	None
13:05	5	250	59.27	0.00	7.05	0.93	8	1.16	16.3	-77.3	Clear	None
13:10	5	250	59.27	0.00	7.07	0.93	6.05	1.18	16.2	-79.1	Clear	None
13:15	5	250	59.27	0.00	7.05	0.94	6.07	1.24	16.3	-79.3	Clear	None
13:20	5	250	59.27	0.00	7.04	0.97	4.56	1.07	16.1	-78.4	Clear	None
13:25	5	250	59.27	0.00	7.03	0.98	4.52	0.96	16	-77.8	Clear	None
13:30	5	250	59.27	0.00	7.02	1	4.59	0.83	16.2	-77.4	Clear	None
13:35	5	250	59.27	0.00	7	1.01	4.58	0.69	15.8	-76.9	Clear	None
13:40	5	250	59.27	0.00	7	1.01	4.58	0.63	15.7	-77	Clear	None
13:45	5	250	59.27	0.00	7	1.03	4.03	0.58	15.6	-74.6	Clear	None
13:50	5	250	59.27	0.00	6.99	1.03	3.99	0.61	15.8	-76.7	Clear	None
13:55	5	250	59.27	0.00	7	1.03	3.97	0.6	15.6	-76.7	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	50 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-25			**Date**	6/10/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Cloudy, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Stainless Steel
Static Water Level (ft-bmp)	63.49	**Total Depth (ft-bmp)**	76.8	**Water Column(ft)**	13	**Gallons in Well**	2.16
MP Elevation		**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:50	**Volumes Purged**		**Sample ID**	MW-25	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	#Error						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:40		250	63.6	0.00	6.79	2.56	76.8	3.16	20.5	-77.7	Clear	None
09:45	5	250	63.6	0.00	6.7	2.79	35.6	0.79	19.8	-76.5	Clear	None
09:50	5	250	63.6	0.00	6.73	2.77	26	0.44	20.4	-82	Clear	None
09:55	5	250	63.6	0.00	6.75	2.73	23.2	0.41	19.8	-83.9	Clear	None
10:00	5	250	63.6	0.00	6.79	2.5	14.9	0.78	19.6	-84.8	Clear	None
10:05	5	250	63.6	0.00	6.87	2.27	12	2.99	19.1	-80.1	Clear	None
10:10	5	250	63.6	0.00	6.93	2.2	35.6	4.31	18.8	-76.2	Clear	None
10:15	5	250	63.6	0.00	6.99	2.15	19.2	6.12	18.5	-70	Clear	None
10:20	5	250	63.6	0.00	6.99	2.15	14.6	6	18.5	-70	Clear	None
10:25	5	250	63.6	0.00	7.02	2.13	9.2	6.17	18.4	-70.9	Clear	None
10:30	5	250	63.6	0.00	7.05	2.13	10.3	6.53	18.3	-71.3	Clear	None
10:35	5	250	63.6	0.00	7.06	2.11	9.82	6.19	18.3	-71.6	Clear	None
10:40	5	250	63.6	0.00	7.07	2.12	11.5	6.67	18.3	-71.5	Clear	None
10:45	5	250	63.6	0.00	7.07	2.12	11.9	6.16	18.1	-71.3	Clear	None
10:50	5	250	63.6	0.00	7.08	2.11	11.1	6.06	18.2	-71	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	50 mL Glass	3	HCL

Comments: Unstable well

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-13-25	**Date**	12/8/2020
Project Name/Location	RACER Lansing, MI			**Weather(°F)**	Cold, overcast

Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	63.11	**Total Depth (ft-bmp)**	72	**Water Column(ft)**	8.89	**Gallons in Well**	1.44
MP Elevation	NA	**Pump Intake (ft-bmp)**	69	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time: 09:50		**Gallons Purged**		**Replicate/ Code No.**	MS/MSD	**Evacuation Method**	Bladder
Purge Start: 08:55							
Purge End: 09:45							

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:05	0	200	63.15	0.00	6.56	2.46	67.3	0.72	11.3	-13.8	Clear	None
09:15	10	200	63.15	0.00	6.79	2.41	23.1	7.09	7.5	-30	Clear	None
09:20	5	200	63.15	0.00	6.83	2.3	18.9	3.86	11.2	-41.1	Clear	None
09:25	5	200	63.15	0.00	6.85	2.31	12.4	3.71	10.9	-42.1	Clear	None
09:30	5	200	63.15	0.00	6.82	2.24	9.8	3.34	10.7	-39.8	Clear	None
09:35	5	200	63.15	0.00	6.85	2.25	6.65	3.24	10.6	-41.5	Clear	None
09:43	8	200	63.15	0.00	6.89	2.25	4.54	3.3	10.3	-44	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-28			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Cloudy, 80's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	63.02	**Total Depth (ft-bmp)**	106	**Water Column(ft)**	43	**Gallons in Well**	27.94
MP Elevation		**Pump Intake (ft-bmp)**	103	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:50	**Volumes Purged**	0.03	**Sample ID**	MW-13-28	**Sampled by**	Billy J Cobern
Purge Start	15:15	**Gallons Purged**	0.92				
Purge End	15:50			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:15		100	63.02	0.00							Clear	No
15:20	5	100	63.09	0.13	10.45	0.242	27.2	7.82	21.9	56.9	Clear	No
15:25	5	100	63.09	0.26	10.44	0.242	17.6	7.49	22.2	56.7	Clear	No
15:30	5	100	63.09	0.40	10.45	0.244	13.9	7.47	22.1	56.5	Clear	No
15:35	5	100	63.09	0.53	10.44	0.245	10.8	711	22.8	56.5	Clear	No
15:40	5	100	63.09	0.66	10.45	0.247	9.49	7.33	22.4	56	Clear	No
15:45	5	100	63.09	0.79	10.45	0.247	9.31	7.4	22.1	56.4	Clear	No
15:50	5	100	63.09	0.92	10.46	0.247	9.17	7.36	22.2	56.4	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	250 mL Amber	1	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-29			**Date**	6/10/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Cloudy, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Stainless Steel
Static Water Level (ft-bmp)	62.66	**Total Depth (ft-bmp)**	78	**Water Column(ft)**	15	**Gallons in Well**	2.49
MP Elevation		**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:20	**Volumes Purged**		**Sample ID**	MW-13-29	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:30		250	62.66	0.00	6.62	3	11.5	1.22	13.8	-36.3	Clear	None
11:35	5	250	62.66	0.00	6.63	2.98	4.6	0.53	16.3	-34.8	Clear	None
11:40	5	250	62.66	0.00	6.63	2.98	8.49	0.41	16.4	-36.1	Clear	None
11:45	5	250	62.7	0.00	6.64	3	8.84	0.29	16.5	-38	Clear	None
11:50	5	250	62.7	0.00	6.64	3.01	8.26	0.29	16.1	-38.2	Clear	None
11:55	5	250	62.7	0.00	6.65	3.03	6.23	0.29	16.2	-39.3	Clear	None
12:00	5	250	62.7	0.00	6.65	3.02	10.5	0.27	16.3	-40.3	Clear	None
12:05	5	250	62.7	0.00	6.66	3.02	12.8	0.25	16.1	-41	Clear	None
12:10	5	250	62.7	0.00	6.66	3.03	6.11	0.25	16	-41.6	Clear	None
12:15	5	250	62.7	0.00	6.66	3.03	6.1	0.25	16.1	-41.9	Clear	None
12:20	5	250	62.7	0.00	6.67	3.03	6.1	0.26	16.1	-42.1	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	50 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-32			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Stainless Steel
Static Water Level (ft-bmp)	5.86	**Total Depth (ft-bmp)**	12.64	**Water Column(ft)**	7	**Gallons in Well**	1.1
MP Elevation		**Pump Intake (ft-bmp)**	11	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:45	**Volumes Purged**		**Sample ID**	MW-13-32	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:50		250	5.86	0.00	6.85	1.19	74.2	0.48	15.9	-15.6	Clear	None
14:55	5	250	5.86	0.00	6.86	1.13	52.9	0.29	15.3	-4.7	Clear	None
15:00	5	250	6.16	0.00	6.92	1	26.9	0.31	15.6	0.2	Clear	None
15:05	5	250	6.16	0.00	6.91	0.91	7.77	0.3	15.6	5.6	Clear	None
15:10	5	250	6.16	0.00	6.95	0.86	1.59	0.44	15.3	5.6	Clear	None
15:15	5	250	6.16	0.00	6.98	0.79	0.7	0.5	15.6	4.3	Clear	None
15:20	5	250	6.16	0.00	7	0.74	0.58	0.41	15.2	3.1	Clear	None
15:25	5	250	6.16	0.00	6.98	0.66	0.57	0.26	14.5	-0.5	Clear	None
15:30	5	250	6.16	0.00	6.98	0.62	0.02	0.2	14.6	-2	Clear	None
15:35	5	250	6.16	0.00	6.99	0.56	0.02	0.15	15	-2.5	Clear	None
15:40	5	250	6.16	0.00	7	0.55	0.02	0.15	14.9	-2.4	Clear	None
15:45	5	250	6.16	0.00	6.99	0.55	0.02	0.14	14.7	-2.4	Clear	None

Constituent Sampled	Container	Number	Preservative
Metals	250 mL Plastic	1	HNO3
SVOCs	1L Amber	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-34			**Date**	6/10/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Mostly Cloudy, 83F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	56.23	**Total Depth (ft-bmp)**	79.76	**Water Column(ft)**	24	**Gallons in Well**	3.82
MP Elevation		**Pump Intake (ft-bmp)**	77.26	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:00	**Volumes Purged**		**Sample ID**	MW-13-34_061020	**Sampled by**	Austin Westhuis
Purge Start	11:25	**Gallons Purged**					
Purge End	12:05			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:30		200	56.23	0.26	7.08	1.5	3.69	0.02	15.6	-87.5	Clear	None
11:35	5	200	56.23	0.53	6.97	1.9	2.04	0.02	15.8	-81.4	Clear	None
11:40	5	200	56.23	0.79	6.91	1.66	1.77	0.01	15.3	-88.7	Clear	None
11:45	5	200	56.23	1.06	6.88	1.72	1.5	0.01	15.3	-89.4	Clear	None
11:50	5	200	56.23	1.32	6.88	1.77	1.42	0.01	15.2	-90.1	Clear	None
11:55	5	200	56.23	1.59	6.88	1.79	1.26	0.01	15.2	-90.9	Clear	None
12:00	5	200	56.23	1.85	6.88	1.81	1.2	0.01	15	-91.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Glass	3	HCL
VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-34			**Date**	08/27/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**	89.1 degrees F and Clear and Windy. The wind is blowing W at 70.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	60.78	**Total Depth (ft-bmp)**	79.9	**Water Column(ft)**	19.12	**Gallons in Well**	3.11
MP Elevation		**Pump Intake (ft-bmp)**	76	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:30	**Volumes Purged**	0.51	**Sample ID**	MW-13-34_082720	**Sampled by**	Billy Cobern
Purge Start	13:30	**Gallons Purged**	1.59	**Replicate/ Code No.**			
Purge End	14:35						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:30	0	0	100	60.78	0.00							--	--
13:35	5	5	100	61.22	0.13	7.14	2.03	897	4.02	25	-57.3	--	--
13:40	5	10	100	61.19	0.26	7.11	2.01	941	1.19	24.1	-77.1	--	--
13:45	5	15	100	61.17	0.40	7.08	1.99	798	0.73	23.1	-86.2	--	--
13:50	5	20	100	61.14	0.53	7.05	1.97	604	0.57	22.6	-92	--	--
13:55	5	25	100	61.11	0.66	7.05	2.01	479	0.57	22.1	-99.9	--	--
14:00	5	30	100	61.11	0.79	6.96	2.18	342	0.35	21.5	-93.4	--	--
14:05	5	35	100	61.11	0.92	6.94	2.21	237	0.33	22	-93.1	--	--
14:10	5	40	100	61.11	1.06	6.98	2.1	212	0.52	22.7	-97.7	--	--
14:15	5	45	100	61.11	1.19	6.93	2.26	223	0.35	21.9	-98.1	--	--
14:20	5	50	100	61.11	1.32	6.93	2.24	197	0.35	21.8	-98.2	--	--
14:25	5	55	100	61.11	1.45	6.93	2.28	204	0.34	21.8	-98.2	--	--
14:30	5	60	100	61.11	1.59	6.93	2.28	204	0.35	21.2	-97.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL

Comments: O2=20.9, CO=0, H2S=0, LEL=0, PID=0

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-34			**Date**	12/01/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	60.21	**Total Depth (ft-bmp)**	80.15	**Water Column(ft)**	19.94	**Gallons in Well**	3.24
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:55	**Volumes Purged**		**Sample ID**	MW-13-34	**Sampled by**	Donald Richmond
Purge Start	15:15	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	16:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:20	0	0	100	60.21	--	6	1.29	67.6	0.66	9.1	-14.1	--	--
15:25	5	5	100	60.21	--	7.2	1.31	69.1	0.47	9.4	-43.9	--	--
15:30	5	10	100	60.21	--	7.16	1.34	79.8	0.28	9.3	-57.8	--	--
15:35	5	15	100	60.21	--	7.02	1.49	73.6	0.18	9.1	-60.8	--	--
15:40	5	20	100	60.21	--	6.99	1.54	84.7	0.2	9.3	-61.9	--	--
15:45	5	25	100	60.21	--	6.98	1.6	87.9	0.14	9.6	-64.7	--	--
15:50	5	30	100	60.21	--	6.97	1.64	96.8	0.12	9.8	-69	--	--
15:55	5	35	100	60.21	--	6.97	1.64	94.5	0.12	9.7	-70.6	Gray	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-35			**Date**	2/18/2020
Project Name/Location	RACER Lansing					**Weather(°F)**	Cloudy, light snow, 37F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.94	**Total Depth (ft-bmp)**	29.53	**Water Column(ft)**	7	**Gallons in Well**	1.07
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:30	**Volumes Purged**		**Sample ID**	MW-13-35_02182020.	**Sampled by**	Austin Westhuis
Purge Start	15:10	**Gallons Purged**					
Purge End	15:40			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:15		200	22.94	0.26	6.63	1.46	3.88	0.82	9.8	44.3	Clear	None
15:20	5	200	22.94	0.53	6.65	1.46	3.6	0.8	9.8	42.1	Clear	None
15:25	5	200	22.94	0.79	6.66	1.46	3.5	0.78	9.7	41	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
SVOCs	1L Amber	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well: Good
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-35			**Date**	08/31/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	79.0 degrees F and Clear. The wind is blowing S/SE at 41.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.81	**Total Depth (ft-bmp)**	29.46	**Water Column(ft)**	6.65	**Gallons in Well**	1.08
MP Elevation		**Pump Intake (ft-bmp)**	26.96	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:50	**Volumes Purged**		**Sample ID**	MW-13-35_083120	**Sampled by**	Austin Westhuis
Purge Start	16:30	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	17:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:35	0	0	100	22.83	0.13	7.03	1.64	2.47	0.2	16.3	-107.8	--	--
16:40	5	5	100	22.83	0.26	7.03	1.65	1.69	0.19	16.7	-113.1	--	--
16:45	5	10	100	22.83	0.40	7.03	1.65	1.55	0.18	16.8	-119.1	--	--
16:50	5	15	100	22.83	0.53	7.03	1.66	1.4	0.18	16.8	-121.1	Clear	None

Constituent Sampled	Container	Number	Preservative
SVOCs	1L Amber	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-36R			**Date**	2/17/2020
Project Name/Location	RACER Lansing					**Weather(°F)**	Cloudy, light snow, 30F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.73	**Total Depth (ft-bmp)**	25.28	**Water Column(ft)**	15	**Gallons in Well**	2.37
MP Elevation		**Pump Intake (ft-bmp)**	10	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:10	**Volumes Purged**		**Sample ID**	NA	**Sampled by**	Austin Westhuis
Purge Start	15:35	**Gallons Purged**		**Replicate/ Code No.**	Dup-01		
Purge End	16:25						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:40		200	5.2	0.26	12.01	0.94	12.6	0.75	5.8	120.8	Clear	None
15:45	5	200	5.2	0.53	11.92	0.95	4.33	0.52	5.8	91.3	Clear	None
15:50	5	200	5.2	0.79	11.6	0.92	2.8	0.41	5.8	77	Clear	None
15:55	5	200	5.2	1.06	10.8	0.91	2.44	0.34	5.9	60.9	Clear	None
16:00	5	200	5.2	1.32	10.78	0.92	2.1	0.35	5.9	58.3	Clear	None
16:05	5	200	5.2	1.59	10.74	0.92	1.88	0.37	5.8	57.2	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
SVOCs	1L Amber	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well: Good
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-13-36R			**Date**	3/4/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	4.56	**Total Depth (ft-bmp)**	12.17	**Water Column(ft)**	7.61	**Gallons in Well**	1.24
MP Elevation	NA	**Pump Intake (ft-bmp)**	10.17	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	12:05	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	11:35						
Purge End:	12:10						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:40	0	200	4.6	0.26	11.89	1.12	3.82	0.09	6	156.7	Clear	None
11:45	5	200	4.6	0.53	11.91	1.12	2.18	0.09	6	157.8	Clear	None
11:50	5	200	4.6	0.79	11.91	1.09	1.48	0.07	5.9	159.4	Clear	None
11:55	5	200	4.6	1.06	11.93	1.06	1.28	0.07	5.9	161.2	Clear	None
12:00	5	200	4.6	1.32	11.96	1.03	1.2	0.07	5.9	162.4	Clear	None
12:05	5	200	4.6	1.59	11.98	1.03	1.25	0.06	5.9	164	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-36R			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Hot, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.53	**Total Depth (ft-bmp)**	12.6	**Water Column(ft)**	7	**Gallons in Well**	1.15
MP Elevation		**Pump Intake (ft-bmp)**	10	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	11:30	**Volumes Purged**		**Sample ID**	MW-13-36R_060420	**Sampled by**	Jacob Pisarkiewicz
Purge Start	11:00	**Gallons Purged**					
Purge End	11:25			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:05		200	5.55	0.00	11.34	0.85	7.56	0.24	15.5	62.5	Clear	None
11:10	5	200	5.55	0.00	11.51	1	2.67	0.15	15.6	55.4	Clear	None
11:15	5	200	5.55	0.00	11.59	1.13	2.06	0.13	15.1	49.5	Clear	None
11:20	5	200	5.55	0.00	11.6	1.16	1.25	0.14	15.4	46.9	Clear	None
11:25	5	200	5.55	0.00	11.62	1.18	0.02	0.13	15.5	46	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
Metals	250 mL Plastic	1	HNO3

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-36R			**Date**	08/31/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	79 °F, Sunny, S winds at 9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.70	**Total Depth (ft-bmp)**	12.74	**Water Column(ft)**	6.04	**Gallons in Well**	0.98
MP Elevation		**Pump Intake (ft-bmp)**	10.24	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:20	**Volumes Purged**		**Sample ID**	MW-13-36R_083120	**Sampled by**	Austin Westhuis
Purge Start	13:45	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	14:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:50	0	0	100	6.77	0.13	11.89	1.54	15.7	0.21	21.6	-138.8	--	--
13:55	5	5	100	6.77	0.26	12.02	1.54	4.33	0.16	19.6	-189.9	--	--
14:00	5	10	100	6.77	0.40	12.02	1.52	2.9	0.14	19.6	-203.1	--	--
14:05	5	15	100	6.77	0.53	12.01	1.5	2.02	0.13	19.5	-209.3	--	--
14:10	5	20	100	6.77	0.66	11.99	1.46	1.79	0.12	19.6	-215.1	--	--
14:15	5	25	100	6.77	0.79	11.99	1.43	1.36	0.12	19.5	-222.1	--	--
14:20	5	30	100	6.77	0.92	11.98	1.42	1.3	0.12	19.5	-225.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
SVOCs	1L Amber	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-36R			**Date**	12/02/2020
Project Name/Location	RACER Lansing/ Lansing, MI		**Weather(°F)**	42.1 degrees F and Clear. The wind is blowing W at 45.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.72	**Total Depth (ft-bmp)**	12.7	**Water Column(ft)**	6.98	**Gallons in Well**	1.13
MP Elevation		**Pump Intake (ft-bmp)**	10	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:55	**Volumes Purged**	0.58	**Sample ID**	MW-13-36R_120220	**Sampled by**	Billy Cobern
Purge Start	13:30	**Gallons Purged**	0.66	**Replicate/ Code No.**	DUP-02_120220		
Purge End	14:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:30	0	0	100	5.72	0.00							--	--
13:35	5	5	100	5.74	0.13	11.76	1.29	18.3	1.47	11.1	73.9	--	--
13:40	5	10	100	5.74	0.26	11.59	1.33	12.6	0.95	11	80.3	--	--
13:45	5	15	100	5.74	0.40	11.59	1.33	8.42	0.86	10.9	81.8	--	--
13:50	5	20	100	5.74	0.53	11.58	1.33	8.41	0.78	11.1	82.5	--	--
13:55	5	25	100	5.74	0.66	11.58	1.33	8.23	0.78	11	82.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-37			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Cloudy, 80's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	64.18	**Total Depth (ft-bmp)**	114.39	**Water Column(ft)**	50	**Gallons in Well**	32.63
MP Elevation		**Pump Intake (ft-bmp)**	112	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	17:15	**Volumes Purged**	0.05	**Sample ID**	MW-13-37_060320	**Sampled by**	Billy J Cobern
Purge Start	16:15	**Gallons Purged**	1.59				
Purge End	17:15			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
16:15		100	64.18	0.00							Clear	No
16:20	5	100	64.2	0.13	8.99	0.75	38.3	6.25	27	125.4	Clear	No
16:25	5	100	64.2	0.26	8.96	0.76	30.2	6.14	27.4	126.1	Clear	No
16:30	5	100	64.2	0.40	8.94	0.76	27.2	6.11	27.5	126	Clear	No
16:35	5	100	64.2	0.53	8.91	0.76	24.1	5.88	27.8	125.5	Clear	No
16:40	5	100	64.2	0.66	8.9	0.76	21.4	5.65	25.2	124	Clear	No
16:45	5	100	64.2	0.79	8.9	0.76	19.4	5.46	25.2	123	Clear	No
16:50	5	100	64.2	0.92	8.9	0.76	17.1	5.46	24.9	123.2	Clear	No
16:55	5	100	64.2	1.06	8.9	0.76	14.6	5.43	25	122.9	Clear	No
17:00	5	100	64.2	1.19	8.9	0.76	11.7	5.44	24.9	122.9	Clear	No
17:05	5	100	64.2	1.32	8.9	0.76	9.92	5.3	25.1	122.8	Clear	No
17:10	5	100	64.2	1.45	8.9	0.75	9.79	5.32	25.1	122.6	Clear	No
17:15	5	100	64.2	1.59	8.89	0.75	9.69	5.28	25.3	122.4	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	250 mL Amber	1	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-38			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 70's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	65.05	**Total Depth (ft-bmp)**	132.5	**Water Column(ft)**	67	**Gallons in Well**	43.84
MP Elevation		**Pump Intake (ft-bmp)**	130	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:00	**Volumes Purged**	0.04	**Sample ID**	MW-13-38_060420	**Sampled by**	Billy J Cobern
Purge Start	08:00	**Gallons Purged**	1.59				
Purge End	09:00			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:00		100	65.05	0.00							Clear	No
08:05	5	100	65.22	0.13	9.17	1.73	22.8	1.09	15.2	184.6	Clear	No
08:10	5	100	65.22	0.26	9.21	1.7	27.8	0.5	15	169.9	Clear	No
08:15	5	100	65.22	0.40	9.21	1.7	29.4	0.45	14.9	165.8	Clear	No
08:20	5	100	65.22	0.53	9.21	1.7	26.7	0.46	15.1	164.1	Clear	No
08:25	5	100	65.22	0.66	9.21	1.7	23.4	0.42	15.1	161.3	Clear	No
08:30	5	100	65.22	0.79	9.22	1.7	19.8	0.41	15.1	158.2	Clear	No
08:35	5	100	65.22	0.92	9.23	1.7	17.8	0.43	15	153.9	Clear	No
08:40	5	100	65.22	1.06	9.24	1.7	16.8	0.47	15.1	151.2	Clear	No
08:45	5	100	65.22	1.19	9.24	1.7	16.1	0.47	15.1	150	Clear	No
08:50	5	100	65.22	1.32	9.24	1.7	15.8	0.49	15.1	149.5	Clear	No
08:55	5	100	65.22	1.45	9.24	1.71	15.3	0.49	15	149.2	Clear	No
09:00	5	100	65.22	1.59	9.25	1.7	15.1	0.5	15	148.9	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	250 mL Amber	1	HCL

Comments: Missing locking cover, all parameters stable, turbidity was above 10 ntu

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Well Locked at Arrival: no

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	no
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-41			**Date**	6/11/2020
Project Name/Location	RACER Lansing					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Stainless Steel
Static Water Level (ft-bmp)	57.08	**Total Depth (ft-bmp)**	86.65	**Water Column(ft)**	30	**Gallons in Well**	4.8
MP Elevation		**Pump Intake (ft-bmp)**	80	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:40	**Volumes Purged**		**Sample ID**	MW-13-41	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:00		250	57.08	0.00	7.52	4.16	40	4.87	16.4	-71.2	Clear	None
12:05	5	250	57.08	0.00	7.43	4.47	57.2	0.82	15.3	-95.1	Clear	None
12:10	5	250	57.08	0.00	7.44	4.46	50.7	0.39	15.3	-105.6	Clear	None
12:15	5	250	57.08	0.00	7.44	4.47	52	0.3	16.1	-111.2	Clear	None
12:20	5	250	57.08	0.00	7.44	4.46	49.6	0.28	15.2	-111.5	Clear	None
12:25	5	250	57.08	0.00	7.44	4.47	52.8	0.25	15	-116.8	Clear	None
12:30	5	250	57.08	0.00	7.46	4.46	71.4	0.26	15.2	-119.1	Clear	None
12:35	5	250	57.08	0.00	7.46	4.46	72	0.25	15.1	-119.4	Clear	None
12:40	5	250	57.08	0.00	7.46	4.47	72.1	0.24	15.1	-119.6	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
VOCs	50 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-43			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 90s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Stainless Steel
Static Water Level (ft-bmp)	62.78	**Total Depth (ft-bmp)**	81	**Water Column(ft)**	18	**Gallons in Well**	2.96
MP Elevation		**Pump Intake (ft-bmp)**	79	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:40	**Volumes Purged**		**Sample ID**	MW13-43	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	#Error						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:25		250	62.78	0.00	7.07	2.03	944	1.65	17.4	-92.2	Clear	None
14:30	5	250	62.78	0.00	7.03	2.18	851	0.75	16.6	-89.5	Clear	None
14:35	5	250	62.78	0.00	7.03	2.25	448	0.47	16.6	-88.1	Clear	None
14:40	5	250	62.78	0.00	7.01	2.26		0.42	15.9	-86.7	Clear	None
14:45	5	250	62.78	0.00	7.04	2.29	302	0.36	15.8	-87.3	Clear	None
14:50	5	250	62.78	0.00	7.04	2.3	258	0.39	15.6	-37	Clear	None
14:55	5	250	62.78	0.00	7.04	2.3	245	0.37	15.7	-86.7	Clear	None
15:00	5	250	62.78	0.00	7.06	2.31	212	0.38	15.7	-87.1	Clear	None
15:05	5	250	62.78	0.00	7.06	2.29	180	0.38	15.6	-86.5	Clear	None
15:10	5	250	62.78	0.00	7.08	2.31	173	0.4	15.6	-86.9	Clear	None
15:15	5	250	62.78	0.00	7.06	2.31	157	0.38	15.6	-85.3	Clear	None
15:20	5	250	62.78	0.00	7.06	2.3	116	0.39	15.7	-85	Clear	None
15:25	5	250	62.78	0.00	7.08	2.31	89	0.38	15.5	-84.6	Clear	None
15:30	5	250	62.78	0.00	7.06	2.31	65.8	0.31	15.7	-84.4	Clear	None
15:35	5	250	62.78	0.00	7.07	2.31	62.1	0.33	15.9	-84.4	Clear	None
15:40	5	250	62.78	0.00	7.07	2.31	61	0.28	15.5	-84.5	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
VOCs	50 mL Glass	3	HCL

Comments: Pump slipped and touched bottom of well. High turbidity as a result

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-13-43			**Date**	12/4/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cold, windy
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	68.15	**Total Depth (ft-bmp)**	79	**Water Column(ft)**	10.85	**Gallons in Well**	1.76
MP Elevation	NA	**Pump Intake (ft-bmp)**	75	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	10:25	**Gallons Purged**		**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	09:05						
Purge End:	10:20						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:25	0	200	70.2	0.00	7.06	2.54	617	5.4	12.2	119	Cloudy	None
09:30	5	200	70.2	0.00	7.07	2.54	589	5.07	12.2	101.1	Cloudy	None
09:35	5	200	70.2	0.00	7.08	2.55	790	4.23	11.9	92.3	Cloudy	None
09:40	5	200	70.2	0.00	7.08	2.52	957	3.9	12.3	86.6	Cloudy	None
09:45	5	200	70.2	0.00	7.08	2.52	785	4.54	11.9	86.3	Cloudy	None
09:50	5	200	70.2	0.00	7.04	2.52	756	4.58	11.9	87.8	Cloudy	None
09:55	5	200	70.2	0.00	7.03	2.52	456	4.6	12.2	88.2	Cloudy	None
10:00	5	200	70.2	0.00	7.06	2.53	459	4.43	11.8	87.9	Cloudy	None
10:05	5	200	70.2	0.00	7.06	2.53	595	4.25	11.8	88.4	Cloudy	None
10:10	5	200	70.2	0.00	7.09	2.51	667	4.16	11.9	87.9	Cloudy	None
10:15	5	200	70.2	0.00	7.07	2.5	676	4.24	11.7	88.9	Cloudy	None
10:20	5	200	70.2	0.00	7.08	2.49	680	4.26	11.7	88.9	Cloudy	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments: Turbidity did not clear up, sampled after 1 hour of purging

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-44			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 80's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	68.02	**Total Depth (ft-bmp)**	122.1	**Water Column(ft)**	54	**Gallons in Well**	35.15
MP Elevation		**Pump Intake (ft-bmp)**	119.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	18:50	**Volumes Purged**	0.03	**Sample ID**	MW-13-44_060420	**Sampled by**	Billy J Cobern
Purge Start	18:10	**Gallons Purged**	1.06				
Purge End	18:50			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
18:10		100	68.02	0.00							Clear	No
18:15	5	100	68.05	0.13	9.13	1.26	24.9	5.07	27	76.3	Clear	No
18:20	5	100	68.05	0.26	7.5	1.42	35.9	6.21	25.2	60.7	Clear	No
18:25	5	100	68.09	0.40	7.29	1.46	34.9	6.01	23.9	15.7	Clear	No
18:30	5	100	68.11	0.53	7.24	1.47	28.8	4.7	22.8	-51.4	Clear	No
18:35	5	100	68.11	0.66	7.24	1.46	29.7	4.6	22.9	-62.2	Clear	No
18:40	5	100	68.11	0.79	7.24	1.47	27.8	4.52	22.9	-66.7	Clear	No
18:45	5	100	68.11	0.92	7.23	1.47	26.1	4.48	22.8	-68.3	Clear	No
18:50	5	100	68.11	1.06	7.23	1.46	25.9	4.48	23	-68.9	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	250 mL Amber	1	HCL

Comments: All parameters stablized, turbidity was above 10 NTU

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-45			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 70s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.32	**Total Depth (ft-bmp)**	77	**Water Column(ft)**	14	**Gallons in Well**	2.22
MP Elevation		**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	09:45	**Volumes Purged**	1.13	**Sample ID**	MW-13-45_060920	**Sampled by**	D. Stockard
Purge Start	08:55	**Gallons Purged**	2.50				
Purge End	09:45			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:55		200	63.32	0.00	6.97	1.04	485	2.14	16.6	198.8	None	None
09:00	5	200	63.76	0.00	7	1.03	278	0.53	15.7	133	None	None
09:10	10	200	63.76	0.00	7.07	97	83.5	0.37	15.5	96	None	None
09:15	5	200	63.76	0.00	7.18	1.05	23.7	0.24	15.4	50.4	None	None
09:25	10	200	63.76	0.00	7.21	1.05	18	0.23	15.3	30.2	None	None
09:30	5	200	63.81	0.00	7.22	1.06	17.6	0.21	15.3	16.4	None	None
09:35	5	200	63.83	0.00	7.22	1.06	18.6	0.19	15.4	7.8	None	None
09:40	5	200	63.83	0.00	7.25	1.06	18	0.18	15.4	4	None	None
09:45	5	200	63.81	0.00	7.25	1.06	17.9	0.18	15.4	-1	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:		Well Locked at Departure:	yes
Well Completion:	NA	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-13-45			**Date**	12/4/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cold, windy
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	63.78	**Total Depth (ft-bmp)**	79	**Water Column(ft)**	15.22	**Gallons in Well**	2.47
MP Elevation	NA	**Pump Intake (ft-bmp)**	74	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	11:45	**Gallons Purged**		**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	10:45						
Purge End:	11:40						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:05	0	200	64.06	0.00	7.14	1.05	30.9	0.22	12.3	-91.8	Clear	None
11:10	5	200	64.06	0.00	7.16	1.11	12.9	0.16	12.4	-92.8	Clear	None
11:15	5	200	64.06	0.00	7.18	1.13	10.2	0.11	12.3	-94.6	Clear	None
11:20	5	200	64.06	0.00	7.22	1.14	9.11	0.1	12.6	-96.3	Clear	None
11:25	5	200	64.06	0.00	7.21	1.14	8.08	0.09	12.4	-95.5	Clear	None
11:30	5	200	64.06	0.00	7.21	1.14	5.77	0.09	12.4	-95.5	Clear	None
11:35	5	200	64.06	0.00	7.23	1.15	4.04	0.08	12.5	-97.2	Clear	None
11:40	5	200	64.06	0.00	7.21	1.14	3.21	0.09	12.7	-95.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant2

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-46			**Date**	6/10/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Mostly Cloudy, 83F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	55.62	**Total Depth (ft-bmp)**	74.62	**Water Column(ft)**	19	**Gallons in Well**	3.09
MP Elevation		**Pump Intake (ft-bmp)**	72.12	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:20	**Volumes Purged**		**Sample ID**	MW-13-46_061020	**Sampled by**	Austin Westhuis
Purge Start	12:50	**Gallons Purged**					
Purge End	13:25			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:55		200	55.62	0.26	6.58	2.04	113	0.78	15.2	-37	Clear	None
13:00	5	200	55.62	0.53	6.57	2.06	49.1	0.74	15	-43.8	Clear	None
13:05	5	200	55.62	0.79	6.55	2.06	20.2	0.54	14.8	-47.6	Clear	None
13:10	5	200	55.62	1.06	6.56	2.06	9.46	0.51	14.8	-48.1	Clear	None
13:15	5	200	55.62	1.32	6.55	2.05	3.29	0.5	14.8	-48.5	Clear	None
13:20	5	200	55.62	1.59	6.55	2.06	2.92	0.49	14.7	-48.8	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-13-46			**Date**	12/7/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Sunny, cold
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	59.2	**Total Depth (ft-bmp)**	73	**Water Column(ft)**	13.8	**Gallons in Well**	2.24
MP Elevation	NA	**Pump Intake (ft-bmp)**	70	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	13:00	**Gallons Purged**		**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	12:15						
Purge End:	12:55						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:25	0	200	59.38	0.00	6.57	2.2	83	0.6	12.3	-36.3	Clear	None
12:30	5	200	59.38	0.00	6.59	2.2	65.8	0.21	12	-32.1	Clear	None
12:35	5	200	59.38	0.00	6.64	2.23	49.2	0.13	11.9	-39	Clear	None
12:40	5	200	59.38	0.00	6.65	2.24	41.1	0.11	11.9	-41.7	Clear	None
12:45	5	200	59.38	0.00	6.67	2.25	40.2	0.1	11.8	-44.6	Clear	None
12:50	5	200	59.38	0.00	6.67	2.26	42.7	0.12	11.6	-46.6	Clear	None
12:55	5	200	59.38	0.00	6.67	2.26	40.9	0.1	11.8	-46.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-47			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 70's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	56.5	**Total Depth (ft-bmp)**	113.7	**Water Column(ft)**	57	**Gallons in Well**	9.29
MP Elevation		**Pump Intake (ft-bmp)**	111	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:25	**Volumes Purged**	0.10	**Sample ID**	MW-13-47_060420	**Sampled by**	Billy J Cobern
Purge Start	10:50	**Gallons Purged**	0.92				
Purge End	11:25			**Replicate/ Code No.**	N/A		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:50		100	56.5	0.00							Clear	No
10:55	5	100	56.55	0.13	7.19	1.71	31.4	6.35	22.6	-108.4	Clear	No
11:00	5	100	56.55	0.26	7.21	1.71	19.7	6.56	21.7	-120.2	Clear	No
11:05	5	100	56.55	0.40	7.23	1.7	14.9	6.17	21.8	-136.3	Clear	No
11:10	5	100	56.55	0.53	7.2	1.69	11.9	5.41	24.1	-142.2	Clear	No
11:15	5	100	56.55	0.66	7.17	1.7	9.66	5.1	25.5	-142.6	Clear	No
11:20	5	100	56.55	0.79	7.17	1.7	9.56	5.16	25.5	-142.1	Clear	No
11:25	5	100	56.55	0.92	7.17	1.7	9.38	5.11	25.6	-142.5	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	250 mL Amber	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-48			**Date**	6/10/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Mostly Cloudy, 83F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	54.92	**Total Depth (ft-bmp)**	73.02	**Water Column(ft)**	18	**Gallons in Well**	2.94
MP Elevation		**Pump Intake (ft-bmp)**	70.52	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:00	**Volumes Purged**		**Sample ID**	MW-13-48_061020	**Sampled by**	Austin Westhuis
Purge Start	10:30	**Gallons Purged**					
Purge End	11:05			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:35		200	54.92	0.26	6.52	2.11	4.89	0.08	15	-58.1	Clear	None
10:40	5	200	54.92	0.53	6.6	2.1	2.19	0.01	14.6	-66.4	Clear	None
10:45	5	200	54.92	0.79	6.6	2.1	1.91	0.01	14.6	-67.4	Clear	None
10:50	5	200	54.92	1.06	6.56	2.1	1.7	0.01	14.5	-67.9	Clear	None
10:55	5	200	54.92	1.32	6.58	2.1	1.6	0.01	14.4	-68.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Glass	3	HCL
VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-13-48			**Date**	12/7/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, cold
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	54.57	**Total Depth (ft-bmp)**	70	**Water Column(ft)**	15.43	**Gallons in Well**	2.51
MP Elevation	NA	**Pump Intake (ft-bmp)**	67	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	14:20	**Gallons Purged**		**Replicate/ Code No.**	Dup-07_120720	**Evacuation Method**	Bladder
Purge Start:	13:40						
Purge End:	14:15						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:50	0	200	54.59	0.00	6.79	2.52	0.02	0.13	11.6	-52.5	Clear	None
13:55	5	200	54.59	0.00	6.82	2.51	0.02	0.08	10.9	-60.4	Clear	None
14:00	5	200	54.59	0.00	6.82	2.49	0.02	0.05	10.9	-60.3	Clear	None
14:05	5	200	54.59	0.00	6.84	2.5	0.02	0.06	11.4	-63.4	Clear	None
14:10	5	200	54.59	0.00	6.84	2.52	0.02	0.05	11.5	-65.9	Clear	None
14:15	5	200	54.59	0.00	6.85	2.53	0.02	0.04	11.6	-66.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-49			**Date**	6/10/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Mostly Cloudy, 83F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	56.44	**Total Depth (ft-bmp)**	81.6	**Water Column(ft)**	25	**Gallons in Well**	4.09
MP Elevation		**Pump Intake (ft-bmp)**	81.25	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:10	**Volumes Purged**		**Sample ID**	MW-13-49_061020	**Sampled by**	Austin Westhuis
Purge Start	09:45	**Gallons Purged**					
Purge End	10:15			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:50		200	56.44	0.26	6.63	1.49	3.81	0.57	15.5	-42.7	Clear	None
09:55	5	200	56.44	0.53	6.65	1.48	2.26	0.47	15.4	-46.5	Clear	None
10:00	5	200	56.44	0.79	6.67	1.48	2.11	0.29	15.3	-48.7	Clear	None
10:05	5	200	56.44	1.06	6.68	1.47	1.94	0.27	15.3	-49.1	Clear	None
10:10	5	200	56.44	1.32	6.68	1.48	1.6	0.27	15.3	-50.2	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-50			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**		**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	71.75	**Total Depth (ft-bmp)**	113	**Water Column(ft)**	41	**Gallons in Well**	
MP Elevation		**Pump Intake (ft-bmp)**	105	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:35	**Volumes Purged**		**Sample ID**	MW-13-50	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:00		250	71.75	0.00	7.24	0.96	44.8	3.15	24.9	-115.9	Clear	None
12:05	5	250	71.75	0.00	7.13	1.27	41.8	3.67	18.5	-115.6	Clear	None
12:10	5	250	71.75	0.00	7.14	1.29	25.2	1.87	17.9	-123.2	Clear	None
12:15	5	250	71.75	0.00	7.14	1.31		0.95	17.2	-126.2	Clear	None
12:55	40	250	71.75	0.00	7.14	1.31	52.9	1.51	19	-130.9	Clear	None
13:00	5	250	71.75	0.00	7.14	1.32	38.7	1.14	21.3	-128.7	Clear	None
13:05	5	250	71.75	0.00	7.14	1.32	36.3	1.03	22	-129.5	Clear	None
13:10	5	250	71.75	0.00	7.14	1.32	29.7	0.95	22.6	-129.6	Clear	None
13:15	5	250	71.75	0.00	7.14	1.33	41.8	1	22.5	-129.8	Clear	None
13:20	5	250	71.75	0.00	7.14	1.36	26.2	1.08	20.4	-131.3	Clear	None
13:25	5	250	71.75	0.00	7.17	1.32	32	0.75	17.2	-130.9	Clear	None
13:30	5	250	71.75	0.00	7.16	1.31	23.4	0.68	17.4	-131.1	Clear	None
13:35	5	250	71.75	0.00	7.16	1.31	14.5	0.66	17.3	-131.8	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	50 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 6

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-51			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 80's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.9	**Total Depth (ft-bmp)**	89.85	**Water Column(ft)**	21	**Gallons in Well**	3.4
MP Elevation		**Pump Intake (ft-bmp)**	87	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:20	**Volumes Purged**	0.43	**Sample ID**	MW-13-51	**Sampled by**	Billy J Cobern
Purge Start	14:25	**Gallons Purged**	1.45				
Purge End	15:20			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:25		100	68.9	0.00							Clear	No
14:30	5	100	69.1	0.13	6.98	1.66	102	2.2	29.3	12.5	Clear	No
14:35	5	100	69.18	0.26	6.94	1.62	98.6	1.68	25.1	4.7	Clear	No
14:40	5	100	69.26	0.40	6.93	1.6	78.2	1.34	24.9	2.1	Clear	No
14:45	5	100	69.26	0.53	6.92	1.59	52.1	0.93	25.6	-1.7	Clear	No
14:50	5	100	69.26	0.66	6.93	1.61	24.8	0.84	24.2	-3.4	Clear	No
14:55	5	100	69.26	0.79	6.93	1.59	23.1	0.74	23.8	-4	Clear	No
15:00	5	100	69.26	0.92	6.92	1.59	19.6	0.67	6.93	-4.3	Clear	No
15:05	5	100	69.26	1.06	6.92	1.57	16.4	0.54	24.4	-6.6	Clear	No
15:10	5	100	69.26	1.19	6.92	1.57	16.6	0.46	25.1	-8.2	Clear	No
15:15	5	100	69.26	1.32	6.92	1.57	16.3	0.47	25	-9.2	Clear	No
15:20	5	100	69.26	1.45	6.92	1.57	16	0.48	25.1	-10.8	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	40 mL Glass	3	HCL

Comments: All parameters stablized, but turbidity was above 10 NTU

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2
Well Locked at Arrival: yes
Condition of Well: Good
Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-52			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Steel
Static Water Level (ft-bmp)	67.15	**Total Depth (ft-bmp)**	82.3	**Water Column(ft)**	15	**Gallons in Well**	2.46
MP Elevation		**Pump Intake (ft-bmp)**	79	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:05	**Volumes Purged**		**Sample ID**	MW-13-52	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:55		250	67.15	0.00	7.06	1.67	41.9	1.53	15.8	-75.7	Clear	None
10:00	5	250	67.15	0.00	7.01	1.66	40.7	1.06	15.4	-77.4	Clear	None
10:05	5	250	67.15	0.00	7.03	1.66	43.1	0.76	15.2	-81.1	Clear	None
10:10	5	250	67.15	0.00	7.03	1.66	47.3	0.79	15	-78	Clear	None
10:15	5	250	67.15	0.00	7.06	1.65	45.3	0.86	14.9	-73.8	Clear	None
10:20	5	250	67.15	0.00	7.08	1.65	46.1	0.98	14.9	-69.5	Clear	None
10:25	5	250	67.15	0.00	7.09	1.65	41.7	1.11	15.1	-65.3	Clear	None
10:30	5	250	67.15	0.00	7.09	1.64	37.5	1.17	15.1	-62.1	Clear	None
10:35	5	250	67.15	0.00	7.09	1.65	37.5	1.22	14.9	-60.1	Clear	None
10:40	5	250	67.15	0.00	7.09	1.64	29.7	1.19	15	-59.7	Clear	None
10:45	5	250	67.15	0.00	7.1	1.65	25	1.22	14.9	-59.7	Clear	None
10:50	5	250	67.15	0.00	7.09	1.64	21.3	1.24	14.9	-60	Clear	None
10:55	5	250	67.15	0.00	7.09	1.63	20.1	1.58	15	-60	Clear	None
11:00	5	250	67.15	0.00	7.09	1.64	20.4	1.29	14.9	-60.9	Clear	None
11:05	5	250	67.15	0.00	7.09	1.65	17.8	1.33	15	-60.3	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	50 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 6	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-13-53			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Stainless Steel
Static Water Level (ft-bmp)	70.4	**Total Depth (ft-bmp)**	86.1	**Water Column(ft)**	16	**Gallons in Well**	2.55
MP Elevation		**Pump Intake (ft-bmp)**	82	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:05	**Volumes Purged**		**Sample ID**	MW-13-53	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:20		250	70.4	0.00	6.91	1.76	35.3	3.64	15.9	-54.6	Clear	None
14:25	5	250	70.4	0.00	6.94	1.71	22.8	0.9	15.7	-53.6	Clear	None
14:30	5	250	70.4	0.00	6.97	1.7	20.6	4.24	15.9	-50.6	Clear	None
14:35	5	250	70.4	0.00	6.99	1.72	19.2	4.65	15.6	-48.7	Clear	None
14:40	5	250	70.4	0.00	7	1.69	18.1	4.83	15.5	-41.5	Clear	None
14:45	5	250	70.4	0.00	7	1.68	16.6	5.17	15.2	-35.9	Clear	None
14:50	5	250	70.4	0.00	7.02	1.69	14.9	5.77	15.1	-33.7	Clear	None
14:55	5	250	70.4	0.00	7.03	1.68	10.9	5.78	14.8	-29.1	Clear	None
15:00	5	250	70.4	0.00	7.04	1.69	10.2	5.78	15.2	-24.7	Clear	None
15:05	5	250	70.4	0.00	7.05	1.68	10.2	5.85	14.9	-23.4	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	50 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-54			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 90s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Stainless Steel
Static Water Level (ft-bmp)	12.96	**Total Depth (ft-bmp)**	19.18	**Water Column(ft)**	6	**Gallons in Well**	1.01
MP Elevation		**Pump Intake (ft-bmp)**	17	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:35	**Volumes Purged**		**Sample ID**	MW-14-54	**Sampled by**	Jessica Fransted
Purge Start	10:35	**Gallons Purged**					
Purge End	11:35			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:35		250	12.96	0.00	8.31	1.42	5.58	0.33	15.1	-162.8	Clear	Gas
10:40	5	250	12.96	0.00	8.31	1.43	0.02	0.33	14.9	-186.5	Clear	Gas
10:45	5	250	13.2	0.00	8.33	1.42	0.02	0.15	14.8	-254.5	Clear	Gas
10:50	5	250	13.2	0.00	8.36	1.42	0.02	0.13	14.8	-275.2	Clear	Gas
10:55	5	250	13.2	0.00	8.37	1.42	1.12	0.11	14.6	-283.6	Clear	Gas
11:00	5	250	13.2	0.00	8.37	1.41	6.81	0.08	14.5	-291.3	Clear	Gas
11:05	5	250	13.2	0.00	8.38	1.41	1.82	0.06	14.4	-297.4	Clear	Gas
11:10	5	250	13.2	0.00	8.38	1.4	7.94	0.06	14.3	-301.3	Clear	Gas
11:15	5	250	13.2	0.00	8.4	1.37	4.17	0.07	14.5	-303.5	Clear	Gas
11:20	5	250	13.2	0.00	8.42	1.33	4.25	0.06	14.5	-307.3	Clear	Gas
11:25	5	250	13.2	0.00	8.43	1.29	4.19	0.06	14.6	-309.5	Clear	Gas
11:30	5	250	13.2	0.00	8.44	1.28	4.16	0.06	14.7	-309.9	Clear	Gas
11:35	5	250	13.2	0.00	8.44	1.29	4.16	0.06	14.6	-309.9	Clear	Gas

Constituent Sampled	**Container**	**Number**	**Preservative**
VOCs	50 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-55			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 90s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Stainless Steel
Static Water Level (ft-bmp)	16.14	**Total Depth (ft-bmp)**	20.3	**Water Column(ft)**	4	**Gallons in Well**	0.68
MP Elevation		**Pump Intake (ft-bmp)**	18	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:25	**Volumes Purged**		**Sample ID**	MW-14-55	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:15		250	16.14	0.00	7.43	0.64	105	7.42	13.8	26.8	Clear	None
12:20	5	250	16.4	0.00	7.39	0.64	48.6	6.65	13.5	19.9	Clear	None
12:25	5	250	16.4	0.00	7.39	0.64	45.3	6.37	13.5	19	Clear	None
12:30	5	250	16.4	0.00	7.39	0.64	42.4	6.47	13.3	24.1	Clear	None
12:35	5	250	16.4	0.00	7.39	0.65	33.2	6.37	12.8	28.2	Clear	None
12:40	5	250	16.4	0.00	7.39	0.64	30.4	6.32	13	31.5	Clear	None
12:45	5	250	16.4	0.00	7.4	0.64	29.1	6.45	13.1	35.1	Clear	None
12:50	5	250	16.4	0.00	7.4	0.64	21.2	6.72	12.5	38.5	Clear	None
12:55	5	250	16.4	0.00	7.41	0.64	17.2	6.27	13.3	43.6	Clear	None
13:00	5	250	16.4	0.00	7.41	0.64	16.4	6.39	13.3	43.8	Clear	None
13:05	5	250	16.4	0.00	7.41	0.64	14.3	6.43	13.4	45.2	Clear	None
13:10	5	250	16.4	0.00	7.42	0.64	12.7	6.23	13.1	47.9	Clear	None
13:15	5	250	16.4	0.00	7.42	0.64	11.7	6.27	12.9	49.9	Clear	None
13:20	5	250	16.4	0.00	7.42	0.64	7.97	6.31	13.3	50.5	Clear	None
13:25	5	250	16.4	0.00	7.42	0.64	10.6	6.36	13.2	50.6	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
VOCs	50 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-56			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	62.75	**Total Depth (ft-bmp)**	78.96	**Water Column(ft)**	16	**Gallons in Well**	2.63
MP Elevation		**Pump Intake (ft-bmp)**	76.46	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:15	**Volumes Purged**		**Sample ID**	MW-14-56_060820	**Sampled by**	Austin Westhuis
Purge Start	14:55	**Gallons Purged**					
Purge End	15:20			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:00		200	62.75	0.26	6.74	4.36	3.76	7.07	14.2	-48.5	Clear	None
15:05	5	200	62.75	0.53	6.76	4.35	2.59	6.36	13.9	-49.1	Clear	None
15:10	5	200	62.75	0.79	6.72	4.35	2.16	5.49	13.9	-49.4	Clear	None
15:10	1440	200	62.75	1.06	6.71	4.34	1.73	5.26	13.8	-49.6	Clear	None
15:15	5	200	62.75	1.32	6.71	4.33	1.6	5.14	13.8	-49.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
1,4-Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-56			**Date**	12/03/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	40 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.68	**Total Depth (ft-bmp)**	79	**Water Column(ft)**	14.32	**Gallons in Well**	2.33
MP Elevation		**Pump Intake (ft-bmp)**	76.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:20	**Volumes Purged**	0.45	**Sample ID**	MW-14-56_120320	**Sampled by**	Austin Westhuis
Purge Start	12:45	**Gallons Purged**	1.06	**Replicate/ Code No.**			
Purge End	13:25						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:50	0	0	100	66.72	0.13	6.98	4.07	24.7	1.08	12.3	-11.8	--	--
12:55	5	5	100	67.09	0.26	7.03	4.09	13.7	0.83	12.5	-27.9	--	--
13:00	5	10	100	67.22	0.40	7.04	4.09	5.82	0.7	12.4	-35.6	--	--
13:05	5	15	100	67.30	0.53	7.04	4.09	3.9	0.63	12.4	-38.3	--	--
13:10	5	20	100	67.35	0.66	7.03	4.09	1.68	0.61	12.4	-40.4	--	--
13:15	5	25	100	67.39	0.79	7.03	4.09	1.55	0.59	12.4	-42.1	--	--
13:20	5	30	100	67.44	0.92	7.03	4.1	1.32	0.57	12.4	-42.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-57			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 90s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Steel
Static Water Level (ft-bmp)	12.95	**Total Depth (ft-bmp)**	21.2	**Water Column(ft)**	8	**Gallons in Well**	1.34
MP Elevation		**Pump Intake (ft-bmp)**	19	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:55	**Volumes Purged**		**Sample ID**	MW-14-57	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:10		250	12.95	0.00	7.36	0.69	56.1	1.88	14.2	95.8	Clear	None
09:15	5	250	13.02	0.00	7.29	0.69	65.6	1.76	14.2	92.6	Clear	None
09:20	5	250	13.02	0.00	7.35	0.68	61.3	1.59	13.9	81.5	Clear	None
09:25	5	250	13.02	0.00	7.4	0.66	57.3	1.46	13.9	75.7	Clear	None
09:30	5	250	13.02	0.00	7.43	0.65	39.9	1.39	14	72.1	Clear	None
09:35	5	250	13.02	0.00	7.45	0.64	21.7	1.38	14	68.4	Clear	None
09:40	5	250	13.02	0.00	7.46	0.64	16.8	1.34	13.9	66.4	Clear	None
09:45	5	250	13.02	0.00	7.47	0.64	12	1.37	14.1	64.6	Clear	None
09:50	5	250	13.02	0.00	7.48	0.64	11.2	1.35	14	62.9	Clear	None
09:55	5	250	13.02	0.00	7.48	0.64	11.4	1.37	13.9	62.9	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	50 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-58			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.08	**Total Depth (ft-bmp)**	29.9	**Water Column(ft)**	16	**Gallons in Well**	2.57
MP Elevation		**Pump Intake (ft-bmp)**	27	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:25	**Volumes Purged**		**Sample ID**	MW-14-58_060920	**Sampled by**	Jacob Pisarkiewicz
Purge Start	13:35	**Gallons Purged**					
Purge End	14:20			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:45		200	14.1	0.00	6.68	5.37	91.3	0.31	19.5	-71.1	Clear	None
13:50	5	200	14.1	0.00	6.68	5.4	63.3	0.26	19.5	-72.4	Clear	None
13:55	5	200	14.1	0.00	6.69	5.31	35.5	0.22	19.9	-74.5	Clear	None
14:00	5	200	14.1	0.00	6.7	5.3	28.1	0.21	20.3	-75.5	Clear	None
14:05	5	200	14.1	0.00	6.71	5.18	25.5	0.21	20.2	-76.5	Clear	None
14:10	5	200	14.1	0.00	6.72	5.05	22.6	0.19	19.8	-77.2	Clear	None
14:15	5	200	14.1	0.00	6.72	5.04	21.1	0.19	20.1	-77.5	Clear	None
14:20	5	200	14.1	0.00	6.73	5.02	20.8	0.19	19.9	-78.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
VOCs	40 mL Glass	3	HCL
1,4-Dioxane	40 mL Glass	0	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-58			**Date**	12/04/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	40 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	14.50	**Total Depth (ft-bmp)**	30.5	**Water Column(ft)**	16	**Gallons in Well**	2.6
MP Elevation		**Pump Intake (ft-bmp)**	28	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:10	**Volumes Purged**	0.36	**Sample ID**	MW-14-58_120420	**Sampled by**	Austin Westhuis
Purge Start	11:40	**Gallons Purged**	0.92	**Replicate/ Code No.**	Dup-04_120420		
Purge End	12:15						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:45	0	0	100	14.53	0.13	6.54	3.75	21.6	0.41	12.1	-47.3	--	--
11:50	5	5	100	14.53	0.26	6.71	3.97	14.1	0.22	12.9	-62.8	--	--
11:55	5	10	100	14.53	0.40	6.77	4.07	5.83	0.13	13.1	-74.3	--	--
12:00	5	15	100	14.53	0.53	6.79	4.07	3.27	0.12	13.3	-76	--	--
12:05	5	20	100	14.53	0.66	6.78	4.08	2.88	0.12	13.4	-77.2	--	--
12:10	5	25	100	14.53	0.79	6.78	4.09	2.4	0.11	13.3	-77.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-59			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.95	**Total Depth (ft-bmp)**	18.8	**Water Column(ft)**	11	**Gallons in Well**	1.76
MP Elevation		**Pump Intake (ft-bmp)**	16.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:15	**Volumes Purged**		**Sample ID**	MW-14-59_060920	**Sampled by**	Jacob Pisarkiewicz
Purge Start	10:30	**Gallons Purged**					
Purge End	11:05			**Replicate/ Code No.**	Dup-01		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:40		200	8.06	0.00	7.24	0.65	7.7	0.27	18.7	-33.3	Clear	None
10:45	5	200	8.13	0.00	7.19	0.66	6.98	0.2	18.2	-43.6	Clear	None
10:50	5	200	8.13	0.00	7.17	0.66	5.95	0.19	18.8	-46.8	Clear	None
10:55	5	200	8.13	0.00	7.19	0.67	4.32	0.25	18.9	-60.1	Clear	None
11:00	5	200	8.13	0.00	7.21	0.67	5.04	0.24	18.7	-62.5	Clear	None
11:05	5	200	8.13	0.00	7.19	0.67	4.04	0.23	18.3	-64.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
VOCs	40 mL Glass	3	HCL
SVOCs	1L Glass	1	None
1,4-Dioxane	40 mL Glass	0	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-59			**Date**	12/04/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	40 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.32	**Total Depth (ft-bmp)**	18.88	**Water Column(ft)**	11.56	**Gallons in Well**	1.88
MP Elevation		**Pump Intake (ft-bmp)**	16.38	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:00	**Volumes Purged**	0.42	**Sample ID**	MW-14-59_120420	**Sampled by**	Austin Westhuis
Purge Start	13:35	**Gallons Purged**	0.79	**Replicate/ Code No.**			
Purge End	14:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:40	0	0	100	7.72	0.13	7.29	0.58	4.71	0.71	12.8	20.2	--	--
13:45	5	5	100	7.72	0.26	7.36	0.57	1.94	0.43	13	1.5	--	--
13:50	5	10	100	7.72	0.40	7.39	0.57	1.6	0.21	13	-10	--	--
13:55	5	15	100	7.72	0.53	7.39	0.57	1.41	0.2	13.1	-10.6	--	--
14:00	5	20	100	7.72	0.66	7.4	0.58	1.15	0.2	13.1	-11.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-60			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.28	**Total Depth (ft-bmp)**	22.5	**Water Column(ft)**	10	**Gallons in Well**	1.66
MP Elevation		**Pump Intake (ft-bmp)**	20	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:10	**Volumes Purged**		**Sample ID**	MW-14-60_060920	**Sampled by**	Jacob Pisarkiewicz
Purge Start	12:10	**Gallons Purged**					
Purge End	13:05			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:20		200	12.3	0.00	7.17	1.29	122	0.39	18.4	-102.6	Clear	None
12:25	5	200	12.3	0.00	7.2	1.28	93.3	0.17	18.6	-112.7	Clear	None
12:30	5	200	12.3	0.00	7.2	1.28	75.6	0.17	18.6	-114.6	Clear	None
12:35	5	200	12.3	0.00	7.24	1.27	71.5	0.14	18.1	-117.2	Clear	None
12:40	5	200	12.3	0.00	7.22	1.27	69.5	0.14	18.1	-116.2	Clear	None
12:45	5	200	12.3	0.00	7.2	1.27	60.8	0.14	18.1	-115.6	Clear	None
12:50	5	200	12.3	0.00	7.2	1.27	52.2	0.15	18.3	-115.3	Clear	None
12:55	5	200	12.3	0.00	7.23	1.27	48.9	0.14	18.4	-117.7	Clear	None
13:00	5	200	12.3	0.00	7.25	1.28	46.1	0.13	18.8	-119.5	Clear	None
13:05	5	200	12.3	0.00	7.25	1.27	44.9	0.14	18.4	-119.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
VOCs	40 mL Glass	3	HCL
SVOCs	1L Glass	1	None
1,4-Dioxane	40 mL Glass	0	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good
Well Locked at Arrival: yes
Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-60			**Date**	12/04/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	40 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.53	**Total Depth (ft-bmp)**	23.6	**Water Column(ft)**	12.07	**Gallons in Well**	1.96
MP Elevation		**Pump Intake (ft-bmp)**	21.1	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:55	**Volumes Purged**		**Sample ID**	MW-14-60_120420	**Sampled by**	Austin Westhuis
Purge Start	14:25	**Gallons Purged**	0.00	**Replicate/ Code No.**			
Purge End	15:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:30	0	0	100	11.53	0.13	7.25	0.88	6.59	0.29	14.1	-81.2	--	--
14:35	5	5	100	11.53	0.26	7.5	0.9	3.28	0.09	14.6	-104.4	--	--
14:40	5	10	100	11.53	0.40	7.5	0.9	3.03	0.06	14.6	-105.2	--	--
14:50	10	20	100	11.53	0.66	7.49	0.91	2.34	0.06	14.5	-104	--	--
14:55	5	25	100	11.53	0.79	7.49	0.92	2.12	0.06	14.4	-103.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-14-61			**Date**	3/3/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 37°
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	64.19	**Total Depth (ft-bmp)**	77.49	**Water Column(ft)**	13.3	**Gallons in Well**	2.16
MP Elevation	NA	**Pump Intake (ft-bmp)**	72	**Purge Method:**	Low-Flow	**Sample Method**	Grab
Sample Time:	10:05	**Gallons Purged**	2.50	**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	09:20						
Purge End:	10:05						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:25	0	126	64.24	0.09	6.98	1.17	53.7	6.81	9.7	50.2	Clear	None
09:30	5	125	64.26	0.16	6.98	1.27	43.3	2.97	12.2	-15.5	Clear	None
09:35	5	125	64.23	0.26	7.01	1.27	35.7	1.13	12.5	-33.4	Clear	None
09:40	5	125	64.24	0.37	7.01	1.28	26.4	1	12.6	-39.7	Clear	None
09:45	5	125	64.15	0.48	7	1.3	15.4	1.3	12.6	-43	Clear	None
09:50	5	125	64.24	0.58	7	1.32	12.6	1.27	12.7	-43.5	Clear	None
09:55	5	125	64.14	0.69	7	1.34	12.5	1.44	12.6	-43.4	Clear	None
10:00	5	125	64.14	0.79	7	1.35	12.9	1.5	12.7	-42.7	Clear	None
10:05	5	125	64.18	0.90	7	1.35	13.2	1.6	12.7	-42.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL
Total P, TKN	250 mL Plastic	1	H2SO4
Nitrate-N	125 mL Plastic	1	None

Sampling By Anyssa Schember

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-61			**Date**	6/2/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.94	**Total Depth (ft-bmp)**	77.5	**Water Column(ft)**	14	**Gallons in Well**	2.2
MP Elevation		**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	13:00	**Volumes Purged**	1.14	**Sample ID**	MW-14-61_060220	**Sampled by**	D. Stockard
Purge Start	11:40	**Gallons Purged**	2.50				
Purge End	13:00			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:50		150	63.9	0.00	6.62	1.82	697	0.46	17.3	155.5	None	None
12:10	15	150	63.99	0.00	6.83	1.88	134	0.41	17.5	43.3	None	None
12:15	5	150	63.99	0.00	6.87	1.9	91.9	0.37	17.4	31.1	None	None
12:25	10	150	63.94	0.00	6.88	-12.2	110	0.75	17.2	-12.8	None	None
12:30	5	150	63.95	0.00	6.83	1.93	112	0.48	16.9	-18.9	None	None
12:36	6	150	63.95	0.00	6.79	1.95	76.8	0.36	16.8	-30.5	None	None
12:42	6	150	63.95	0.00	6.81	1.97	56	0.37	16.7	-38.6	None	None
12:47	5	150	64.01	0.00	6.82	1.97	49.6	0.35	16.6	-41.4	None	None
12:57	10	150	64.01	0.00	6.85	1.97	51.7	0.36	16.8	-45.2	None	None

Constituent Sampled	Container	Number	Preservative
SVOCs	1L Amber	1	None
VOCs	40 mL Glass	3	HCL
PFAS	250 mL Plastic	2	None
Nitrate/Nitrite	125 mL Plastic	1	None
	250 mL Plastic	1	H2SO4

Comments: Also sampled TP and TKN

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: NA

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-61			**Date**	08/31/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	62.98	**Total Depth (ft-bmp)**	77.4	**Water Column(ft)**	14.42	**Gallons in Well**	2.34
MP Elevation		**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:00	**Volumes Purged**	0.51	**Sample ID**	MW-14-61_083120	**Sampled by**	Billy Cobern
Purge Start	12:15	**Gallons Purged**	1.19	**Replicate/ Code No.**			
Purge End	13:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:15	0	0	100	62.98	0.00							--	--
12:20	5	5	100	63.10	0.13	7.41	1.84	296	5.79	23	113.3	--	--
12:25	5	10	100	63.15	0.26	7.22	1.85	269	3.45	19.8	115.2	--	--
12:30	5	15	100	63.20	0.40	7.1	1.85	256	2.7	19.4	117.3	--	--
12:35	5	20	100	63.22	0.53	7.09	1.84	213	2.65	19	117.4	--	--
12:40	5	25	100	63.22	0.66	7.09	1.85	178	2.67	19.1	117.4	--	--
12:45	5	30	100	63.22	0.79	7.09	1.84	139	2.54	19.1	117.5	--	--
12:50	5	35	100	63.22	0.92	7.09	1.85	101	2.66	19	117.5	--	--
12:55	5	40	100	63.22	1.06	7.09	1.84	97.2	2.66	19.1	117.6	--	--
13:00	5	45	100	63.22	1.19	7.09	1.84	96.2	2.55	19.1	117.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL
Nitrate	125 mL Plastic	1	None
TKN/Total Phosphorus	250 mL Plastic	1	H2SO4

Comments: O2=20.9, CO=0, H2S=0, LEL=0, PID=0

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-14-61			**Date**	12/2/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Sunny, cold
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	65	**Total Depth (ft-bmp)**	75	**Water Column(ft)**	10	**Gallons in Well**	1.62
MP Elevation	NA	**Pump Intake (ft-bmp)**	71	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time: 11:25		**Gallons Purged**		**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start: 10:35							
Purge End: 11:15							

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:45	0	200	63.75	0.00	7.35	1.77	0.02	6.91	11.5	38.3	Clear	None
10:50	5	200	63.8	0.00	7.19	1.78	0.02	1.97	11.6	37.7	Clear	None
10:55	5	200	63.8	0.00	7.2	1.78	0.02	1.4	11.7	34.4	Clear	None
11:00	5	200	63.8	0.00	7.21	1.78	0.02	1.33	11.7	33.8	Clear	None
11:05	5	200	63.8	0.00	7.25	1.81	0.02	1.33	11.4	31.8	Clear	None
11:10	5	200	63.8	0.00	7.26	1.83	0.02	1.3	11.4	32	Clear	None
11:15	5	200	63.8	0.00	7.2	1.83	0.02	1.27	11.3	31.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL
VOCs	40 mL Vial	3	HCL
PFAS	250 mL Plastic	2	None
Total P/TKN	250 mL Plastic	1	H2SO4
Nitrate	250 mL Plastic	1	None

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-62			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.72	**Total Depth (ft-bmp)**	19.6	**Water Column(ft)**	14	**Gallons in Well**	2.26
MP Elevation		**Pump Intake (ft-bmp)**	17	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:00	**Volumes Purged**		**Sample ID**	MW-14-62_060920	**Sampled by**	Jacob Pisarkiewicz
Purge Start	09:15	**Gallons Purged**					
Purge End	09:55			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:25		200	5.83	0.00	10.82	0.49	0.02	0.25	17.7	14.4	Clear	None
09:30	5	200	5.83	0.00	11.03	0.58	0.02	0.14	17.3	-46.4	Clear	None
09:35	5	200	5.83	0.00	11.13	0.58	0.02	0.14	17.2	-73.6	Clear	None
09:40	5	200	5.83	0.00	11.14	0.58	0.02	0.11	17.3	-86.6	Clear	None
09:45	5	200	5.83	0.00	11.2	0.57	0.02	0.11	17.2	-98.2	Clear	None
09:50	5	200	5.83	0.00	11.18	0.55	0.02	0.12	17.4	-101.1	Clear	None
09:55	5	200	5.83	0.00	11.17	0.56	0.02	0.11	17.3	-103.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
VOCs	40 mL Glass	3	HCL
SVOCs	1L Glass	1	None
1,4-Dioxane	40 mL Glass	0	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-62			**Date**	12/04/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	40 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.82	**Total Depth (ft-bmp)**	19.6	**Water Column(ft)**	14.78	**Gallons in Well**	2.4
MP Elevation		**Pump Intake (ft-bmp)**	17.1	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:10	**Volumes Purged**	0.39	**Sample ID**	MW-14-62_120420	**Sampled by**	Austin Westhuis
Purge Start	09:40	**Gallons Purged**	0.92	**Replicate/ Code No.**			
Purge End	10:15						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:45	0	0	100	4.90	0.13	11.14	0.391	12.3	0.14	12.5	-168.2	--	--
09:50	5	5	100	4.90	0.26	11.16	0.392	4.68	0.12	12.4	-172.9	--	--
09:55	5	10	100	4.90	0.40	11.16	0.395	2.85	0.14	12.5	-176	--	--
10:00	5	15	100	4.90	0.53	11.16	0.399	2.24	0.1	12.5	-200.3	--	--
10:05	5	20	100	4.90	0.66	11.16	0.408	2.01	0.1	12.6	-206.1	--	--
10:10	5	25	100	4.90	0.79	11.17	0.409	1.66	0.1	12.6	-208.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-63			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 70's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	58.12	**Total Depth (ft-bmp)**	77.12	**Water Column(ft)**	19	**Gallons in Well**	3.09
MP Elevation		**Pump Intake (ft-bmp)**	74.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:15	**Volumes Purged**	0.47	**Sample ID**	MW-14-63_060820	**Sampled by**	Billy J Cobern
Purge Start	08:20	**Gallons Purged**	1.45				
Purge End	09:15			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:20		100	58.12	0.00							Clear	No
08:25	5	100	58.28	0.13	6.89	1.21	98.5	4.39	16.2	329	Clear	No
08:30	5	100	58.45	0.26	6.91	1.2	81.4	3.87	16.1	5.3	Clear	No
08:35	5	100	58.55	0.40	6.94	1.19	76.8	4.26	16.2	-16.7	Clear	No
08:40	5	100	58.49	0.53	6.95	1.19	67.9	4.09	16.6	-31.2	Clear	No
08:45	5	100	58.44	0.66	6.95	1.2	51.2	3.98	16.4	-47.9	Clear	No
08:50	5	100	58.44	0.79	6.95	1.2	45.1	3.99	16.4	-50.1	Clear	No
08:55	5	100	58.44	0.92	6.95	1.2	33.1	3.83	16.5	-51.7	Clear	No
09:00	5	100	58.44	1.06	6.95	1.2	23.8	3.79	16.4	-53.3	Clear	No
09:05	5	100	58.44	1.19	6.95	1.2	17.7	3.8	16.4	-54.7	Clear	No
09:10	5	100	58.44	1.32	6.95	1.2	17.4	3.85	16.5	-56.1	Clear	No
09:15	5	100	58.44	1.45	6.95	1.2	17.9	3.81	16.5	-57.6	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	40 mL Glass	3	HCL

Comments: All parameters stablized, but turbidity was above 10 NTU

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-64			**Date**	6/11/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	62.41	**Total Depth (ft-bmp)**	107.2	**Water Column(ft)**	45	**Gallons in Well**	7.28
MP Elevation		**Pump Intake (ft-bmp)**	103	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:35	**Volumes Purged**		**Sample ID**	MW-14-64_061020	**Sampled by**	Jacob Pisarkiewicz
Purge Start	11:00	**Gallons Purged**					
Purge End	11:30			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:05		200	62.41	0.00	7.01	1.74	7.06	5.02	17.2	-23.3	Clear	None
11:10	5	200	62.5	0.00	6.97	1.77	2.04	1.87	16.8	-60.3	Clear	None
11:15	5	200	62.5	0.00	6.99	1.76	1.23	1.69	16.7	-67.2	Clear	None
11:20	5	200	62.5	0.00	6.99	1.77	0.02	1.72	17.2	-70.9	Clear	None
11:25	5	200	62.5	0.00	7.01	1.76	0.02	1.69	17.6	-73.6	Clear	None
11:30	5	200	62.5	0.00	7.01	1.77	0.02	1.68	17.6	-76.5	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	40 mL Glass	3	HCL

Comments: Pump stopped working, had to swap to different pump

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-66			**Date**	6/2/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Hot, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.38	**Total Depth (ft-bmp)**	22.22	**Water Column(ft)**	18	**Gallons in Well**	2.9
MP Elevation		**Pump Intake (ft-bmp)**	20	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	15:20	**Volumes Purged**		**Sample ID**	MW-14-66_060220	**Sampled by**	Jacob Pisarkiewicz
Purge Start	14:40	**Gallons Purged**					
Purge End	15:15			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:50		200	5.24	0.00	7.49	0.86	0.41	0.28	18.4	43.2	Clear	None
14:55	5	200	5.65	0.00	7.43	0.86	0.02	0.2	18.7	16.7	Clear	None
15:00	5	200	5.65	0.00	7.4	0.88	0.02	0.23	18.3	3.8	Clear	None
15:05	5	200	5.65	0.00	7.39	0.88	0.02	0.23	18.2	-2.8	Clear	None
15:10	5	200	5.65	0.00	7.37	0.88	0.02	0.25	18.6	-3.6	Clear	None
15:15	5	200	5.65	0.00	7.37	0.87	0.02	0.22	18.8	-4.8	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
Metals	250 mL Plastic	1	HNO3

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-14-67			**Date**	3/4/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	4.6	**Total Depth (ft-bmp)**	20.8	**Water Column(ft)**	16.2	**Gallons in Well**	2.63
MP Elevation	NA	**Pump Intake (ft-bmp)**	18.8	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	11:05	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	10:40						
Purge End:	11:10						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:45	0	200	5.08	0.26	7.43	1.06	6.15	0.62	7.8	113	Clear	None
10:50	5	200	5.08	0.53	7.42	1.12	3.92	0.22	8.2	117	Clear	None
10:55	5	200	5.08	0.79	7.42	1.13	2.44	0.21	8.2	117.6	Clear	None
11:00	5	200	5.08	1.06	7.39	1.17	1.9	0.19	8.2	120.4	Clear	None
11:05	5	200	5.08	1.06	7.39	1.17	1.82	0.18	8.2	121.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-67			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Hot, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.93	**Total Depth (ft-bmp)**	20.8	**Water Column(ft)**	16	**Gallons in Well**	2.58
MP Elevation		**Pump Intake (ft-bmp)**	18	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	10:35	**Volumes Purged**		**Sample ID**	MW-14-67_060420	**Sampled by**	Jacob Pisarkiewicz
Purge Start	21:50	**Gallons Purged**					
Purge End	10:30			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:05		200	5.25	0.00	7.26	1.6	15.3	0.29	15.3	65.1	Clear	None
10:10	5	200	5.25	0.00	7.26	1.61	11.1	0.25	15.2	62.9	Clear	None
10:15	5	200	5.4	0.00	7.26	1.63	6.12	0.22	15	60.7	Clear	None
10:20	5	200	5.4	0.00	7.25	1.64	3.34	0.2	15.3	59.5	Clear	None
10:25	5	200	5.4	0.00	7.24	1.69	2.52	0.2	15.1	57.9	Clear	None
10:30	5	200	5.4	0.00	7.23	1.69	2.2	20	15.3	58.3	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None
Metals	250 mL Plastic	1	HNO3

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-67			**Date**	08/31/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	79 °F, Sunny, S winds at 9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.07	**Total Depth (ft-bmp)**	20.81	**Water Column(ft)**	14.74	**Gallons in Well**	2.4
MP Elevation		**Pump Intake (ft-bmp)**	18.31	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:20	**Volumes Purged**		**Sample ID**	MW-14-67_083120	**Sampled by**	Austin Westhuis
Purge Start	12:45	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	13:25						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:50	0	0	100	6.42	0.13	7.94	1.37	21.2	0.16	18.9	-34.1	--	--
12:55	5	5	100	6.44	0.26	8	1.38	12.6	0.14	18.9	-41	--	--
13:00	5	10	100	6.49	0.40	8.12	1.36	4.82	0.08	18.3	-78.6	--	--
13:05	5	15	100	6.51	0.53	8.12	1.35	1.79	0.08	18.2	-100.1	--	--
13:10	5	20	100	6.52	0.66	8.13	1.35	1.3	0.08	18.1	-102.7	--	--
13:15	5	25	100	6.52	0.79	8.13	1.34	1.21	0.08	18	-104	--	--
13:20	5	30	100	6.52	0.92	8.13	1.34	1.04	0.08	18	-104.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-67			**Date**	12/02/2020
Project Name/Location	RACER Lansing/ Lansing, MI		**Weather(°F)**	37.0 degrees F and Clear. The wind is blowing W at 41.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.63	**Total Depth (ft-bmp)**	20.8	**Water Column(ft)**	15.17	**Gallons in Well**	2.46
MP Elevation		**Pump Intake (ft-bmp)**	18	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:10	**Volumes Purged**	0.43	**Sample ID**	MW-14-67_120220	**Sampled by**	Billy Cobern
Purge Start	12:30	**Gallons Purged**	1.06	**Replicate/ Code No.**			
Purge End	13:15						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:30	0	0	100	5.63	0.00							--	--
12:35	5	5	100	6.13	0.13	7.84	0.433	17.2	1.01	9.7	53.2	--	--
12:40	5	10	100	6.25	0.26	7.71	0.429	13.7	0.92	8.5	61.8	--	--
12:45	5	15	100	6.36	0.40	7.67	0.426	10.9	0.85	8.2	66.7	--	--
12:50	5	20	100	6.46	0.53	7.66	0.427	10.1	0.81	8.7	68	--	--
12:55	5	25	100	6.57	0.66	7.7	0.426	9.68	0.73	9	67.7	--	--
13:00	5	30	100	6.68	0.79	7.76	0.429	9.74	0.74	8.4	66.1	--	--
13:05	5	35	100	6.77	0.92	7.76	0.429	9.48	0.71	8.4	66.7	--	--
13:10	5	40	100	6.86	1.06	7.75	0.428	9.31	0.7	8.5	67.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 6

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-14-70	**Date**	3/4/2020
Project Name/Location	RACER Lansing, MI			**Weather(°F)**	Cloudy, 40F

Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	9.6	**Total Depth (ft-bmp)**	23.1	**Water Column(ft)**	13.5	**Gallons in Well**	2.19
MP Elevation	NA	**Pump Intake (ft-bmp)**	21.1	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time: 08:50		**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start: 08:20							
Purge End: 08:55							

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:25	0	200	10.19	0.26	7.14	0.95	2.16	1.45	8.2	239.3	Clear	None
08:30	5	200	10.26	0.53	7.18	0.95	1.86	1.48	8.2	233.4	Clear	None
08:35	5	200	10.46	0.79	7.27	0.95	1.43	1.24	8.3	222.1	Clear	None
08:40	5	200	10.52	1.06	7.31	0.95	1.33	1.09	8.4	216.2	Clear	None
08:45	5	200	10.57	1.32	7.31	0.95	1.21	1.1	8.3	215.8	Clear	None
08:50	5	200	10.6	1.32	7.31	0.95	1.11	1.09	8.3	213.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-70			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Hot, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.78	**Total Depth (ft-bmp)**	23.1	**Water Column(ft)**	13	**Gallons in Well**	2.16
MP Elevation		**Pump Intake (ft-bmp)**	20	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	16:10	**Volumes Purged**		**Sample ID**	MW-14-70_060320	**Sampled by**	Jacob Pisarkiewicz
Purge Start	15:45	**Gallons Purged**					
Purge End	16:05			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:50		200	10.35	0.00	7.23	1.35	5.17	0.43	16.1	23.3	Clear	None
15:55	5	200	10.55	0.00	7.22	1.35	2.93	0.25	16	19.9	Clear	None
16:00	5	200	10.55	0.00	7.22	1.35	3.13	0.2	15.9	17	Clear	None
16:05	5	200	10.55	0.00	7.23	1.35	2.45	0.21	16	16.9	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 6
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-70			**Date**	08/31/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	73 °F, Sunny, S winds at 8 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.58	**Total Depth (ft-bmp)**	23.1	**Water Column(ft)**	10.52	**Gallons in Well**	1.71
MP Elevation		**Pump Intake (ft-bmp)**	20.6	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:35	**Volumes Purged**		**Sample ID**	MW-14-70_083120	**Sampled by**	Austin Westhuis
Purge Start	11:05	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:10	0	0	100	13.05	0.13	7.22	1.36	2.81	0.17	15.6	-39.9	--	--
11:15	5	5	100	13.05	0.26	7.19	1.36	2.11	0.12	15.3	-66.7	--	--
11:20	5	10	100	13.05	0.40	7.18	1.32	1.64	0.12	15.2	-101.4	--	--
11:25	5	15	100	13.05	0.53	7.18	1.32	1.51	0.12	15.1	-103.2	--	--
11:30	5	20	100	13.05	0.66	7.19	1.31	1.22	0.11	15	-107.5	--	--
11:35	5	25	100	13.05	0.79	7.19	1.31	1.16	0.11	15	-109.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-14-70			**Date**	12/02/2020
Project Name/Location	RACER Lansing/ Lansing, MI		**Weather(°F)**	34.0 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.22	**Total Depth (ft-bmp)**	23.1	**Water Column(ft)**	11.88	**Gallons in Well**	1.93
MP Elevation		**Pump Intake (ft-bmp)**	21	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:20	**Volumes Purged**	0.55	**Sample ID**	OW-14-70_120220	**Sampled by**	Billy Cobern
Purge Start	10:40	**Gallons Purged**	1.06	**Replicate/ Code No.**			
Purge End	11:25						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:40	0	0	100	11.22	0.00							--	--
10:45	5	5	100	11.48	0.13	7.43	1.38	14.1	4.6	11.6	47.7	--	--
10:50	5	10	100	11.54	0.26	7.33	1.45	11.8	2.84	12.2	45.7	--	--
10:55	5	15	100	11.54	0.40	7.17	1.56	10.6	1.74	12.3	43.6	--	--
11:00	5	20	100	11.54	0.53	7.16	1.64	9.74	0.89	12.5	40.5	--	--
11:05	5	25	100	11.54	0.66	7.15	1.64	9.72	0.82	12.8	39.6	--	--
11:10	5	30	100	11.54	0.79	7.15	1.66	9.12	0.72	12.7	38.9	--	--
11:15	5	35	100	11.54	0.92	7.14	1.67	8.87	0.7	12.7	39.3	--	--
11:20	5	40	100	11.54	1.06	7.13	1.67	8.73	0.67	12.7	39.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 6

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-15-71			**Date**	6/11/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	61.02	**Total Depth (ft-bmp)**	119	**Water Column(ft)**	58	**Gallons in Well**	9.42
MP Elevation		**Pump Intake (ft-bmp)**	115	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:40	**Volumes Purged**		**Sample ID**	MW-15-71_061020	**Sampled by**	Jacob Pisarkiewicz
Purge Start	09:25	**Gallons Purged**					
Purge End	10:35			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:10		200	61.02	0.00	7.08	1.5	11.6	2.77	16.9	37.7	Clear	None
10:15	5	200	61.02	0.00	7.05	1.5	9.95	1.75	14.3	43.5	Clear	None
10:20	5	200	61.02	0.00	7.04	1.5	8.12	1.43	14.3	43.8	Clear	None
10:25	5	200	61.02	0.00	7.02	1.5	7.39	1.33	14.3	45	Clear	None
10:30	5	200	61.02	0.00	7.01	1.5	5.99	1.27	14.3	45.7	Clear	None
10:35	5	200	61.02	0.00	7	1.49	6.03	1.25	14.1	45.9	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	40 mL Glass	3	HCL

Comments: Pump stopped working, had to swap to different pump

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-15-72	**Date**	3/2/2020
Project Name/Location	RACER Lansing, MI			**Weather(°F)**	Sunny, 46°

Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	57	**Total Depth (ft-bmp)**	70.33	**Water Column(ft)**	13.33	**Gallons in Well**	2.17
MP Elevation	NA	**Pump Intake (ft-bmp)**	65	**Purge Method:**	Low-Flow	**Sample Method**	Grab
Sample Time: 14:00 **Purge Start:** 13:25 **Purge End:** 14:00		**Gallons Purged**	2.50	**Replicate/ Code No.**		**Evacuation Method**	Bladder

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:30	0	200	57.88	0.13	7.05	0.76	18.6	1.22	13.4	-17.8	Clear	None
13:35	5	200	58.01	0.26	7.05	0.76	16	1.01	13.3	-35.8	Clear	None
13:40	5	200	57.96	0.40	7.04	0.76	15.9	1.02	13.3	-43.3	Clear	None
13:45	5	200	57.99	0.53	7.06	0.77	17.2	0.77	13.5	-50	Clear	None
13:50	5	200	57.9	0.66	7.06	0.78	28.5	0.68	13.3	-51.9	Clear	None
13:55	5	200	57.84	0.79	7.05	0.83	26.3	0.62	13.1	-54.7	Clear	None
14:00	5	200	57.88	0.92	7.07	0.86	24.9	0.63	13.3	-56.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Anyssa Schember

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-15-72			**Date**	6/2/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	57.62	**Total Depth (ft-bmp)**	70.3	**Water Column(ft)**	13	**Gallons in Well**	2.06
MP Elevation		**Pump Intake (ft-bmp)**	67	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	16:10	**Volumes Purged**	1.94	**Sample ID**	MW-15-72_060220	**Sampled by**	D. Stockard
Purge Start	14:40	**Gallons Purged**	4.00				
Purge End	16:09			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:40		150	57.8	0.00	7.08	1.23	134	7.17	20.1	-67.9	None	None
14:50	10	150	57.57	0.00	7.12	1.26	88.4	4.28	19.4	-72.4	None	None
14:55	5	150	57.6	0.00	7.07	1.33	63.3	3.69	19.8	-75.4	None	None
15:00	5	150	57.6	0.00	7.04	1.33	57.9	4.19	19.9	-72.1	None	None
15:05	5	150	57.56	0.00	7.13	1.32	87.1	4.92	21.8	-74.8	None	None
15:20	15	150	57.57	0.00	7.33	1.34	84	7.6	18.7	-92.6	None	None
15:50	30	150	57.57	0.00	6.8	1.31	146	0.32	17.2	-74.4	None	None
15:55	5	150	57.57	0.00	6.85	1.35	90.9	0.28	17.9	-79.9	None	None
16:00	5	150	57.57	0.00	6.88	1.39	64.5	0.27	17	-84.8	None	None
16:08	8	150	57.57	0.00	6.9	1.4	50.4	0.18	17.1	-84.5	None	None

Constituent Sampled	Container	Number	Preservative
SVOCs	1L Amber	1	None
1,4-D and VOCs	40 mL Glass	3	HCL
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure:
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-15-72			**Date**	09/01/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**	77.0 degrees F and Mostly Cloudy. The wind is blowing undefined at 12.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	55.99	**Total Depth (ft-bmp)**	70.3	**Water Column(ft)**	14.31	**Gallons in Well**	2.33
MP Elevation		**Pump Intake (ft-bmp)**	68	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:05	**Volumes Purged**	0.57	**Sample ID**	MW-15-72_090120	**Sampled by**	Billy Cobern
Purge Start	14:15	**Gallons Purged**	1.32	**Replicate/ Code No.**			
Purge End	15:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:15	0	0	100	55.99	0.00							--	--
14:20	5	5	100	56.20	0.13	7.23	1.12	88	4.21	24.6	-47.2	--	--
14:25	5	10	100	56.20	0.26	7.07	1.1	100	1.19	22.2	-76.4	--	--
14:30	5	15	100	56.20	0.40	7.04	1.09	96.6	0.42	22.3	-85.7	--	--
14:35	5	20	100	56.20	0.53	7.04	1.09	82.8	0.32	21.4	-87.5	--	--
14:40	5	25	100	56.20	0.66	7.04	1.09	66.7	0.29	21.6	-87.4	--	--
14:45	5	30	100	56.20	0.79	7.04	1.09	48.3	0.29	21.7	-87.5	--	--
14:50	5	35	100	56.20	0.92	7.04	1.09	25.4	0.3	21.7	-87.7	--	--
14:55	5	40	100	56.20	1.06	7.04	1.09	15.5	0.29	21.9	-88	--	--
15:00	5	45	100	56.20	1.19	7.04	1.09	15.1	0.29	21.8	-88.2	--	--
15:05	5	50	100	56.20	1.32	7.05	1.09	14.1	0.29	21.8	-88.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL

Comments: O2=20.9, CO=0, H2S=0, LEL=0, PID=0

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-15-72	**Date**	12/3/2020
Project Name/Location	RACER Lansing, MI			**Weather(°F)**	Sunny, cold

Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	56.65	**Total Depth (ft-bmp)**	68	**Water Column(ft)**	11.35	**Gallons in Well**	1.84
MP Elevation	NA	**Pump Intake (ft-bmp)**	64	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	09:55	**Gallons Purged**		**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	08:55						
Purge End:	09:50						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:10	0	200	57.2	0.00	6.77	1.02	0.02	0.66	12	-66.7	Clear	None
09:15	5	200	57.2	0.00	6.8	1.03	4.72	0.37	12.2	-79	Clear	None
09:20	5	200	57.2	0.00	6.85	1.07	12.2	0.23	12.5	-82.9	Clear	None
09:25	5	200	57.2	0.00	6.98	1.15	18.7	0.13	12	-91.7	Clear	None
09:30	5	200	57.2	0.00	6.92	1.22	20.5	0.11	12.4	-87.8	Clear	None
09:35	5	200	57.2	0.00	6.95	1.24	19.6	0.1	12.1	-91.9	Clear	None
09:40	5	200	57.2	0.00	6.99	1.28	18.9	0.09	12.5	-91	Clear	None
09:45	5	200	57.2	0.00	7	1.32	18	0.1	12.3	-93.3	Clear	None
09:50	5	200	57.2	0.00	7.01	1.32	17.6	0.09	12.4	-93.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL
PFAS	250 mL Plastic	2	None

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-15-73			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 70's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.49	**Total Depth (ft-bmp)**	81.42	**Water Column(ft)**	18	**Gallons in Well**	2.91
MP Elevation		**Pump Intake (ft-bmp)**	79	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:15	**Volumes Purged**	0.54	**Sample ID**	MW-15-73_060820	**Sampled by**	Billy J Cobern
Purge Start	11:15	**Gallons Purged**	1.59				
Purge End	12:15			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:15		100	63.49	0.00							Clear	No
11:20	5	100	63.79	0.13	6.78	2.79	584	2.48	16.9	-9.6	Clear	No
11:25	5	100	63.79	0.26	6.77	2.77	513	1	16.9	-26	Clear	No
11:30	5	100	63.79	0.40	6.76	2.78	445	0.72	6.76	-37.1	Clear	No
11:35	5	100	63.79	0.53	6.75	2.82	398	0.62	20.7	-43.1	Clear	No
11:40	5	100	63.79	0.66	6.76	2.89	279	0.6	19.2	-45.2	Clear	No
11:45	5	100	63.79	0.79	6.76	2.87	234	0.47	18.5	-43.9	Clear	No
11:50	5	100	63.79	0.92	6.76	2.86	213	0.41	19.4	-44.4	Clear	No
11:55	5	100	63.79	1.06	6.76	2.87	189	0.43	19.5	-44.7	Clear	No
12:00	5	100	63.79	1.19	6.76	2.87	157	0.38	19.5	-44.7	Clear	No
12:05	5	100	63.79	1.32	6.76	2.88	113	0.39	19	-44.5	Clear	No
12:10	5	100	63.79	1.45	6.76	2.88	69.9	0.38	19	-44.4	Clear	No
12:15	5	100	63.79	1.59	6.76	2.88	79.2	0.36	19	-44.1	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	40 mL Glass	3	HCL

Comments: Turbidity didn't stabilize or fall below 10 NTU

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-16-74			**Date**	3/2/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Sunny, 48°
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	62.85	**Total Depth (ft-bmp)**	73.69	**Water Column(ft)**	10.84	**Gallons in Well**	1.76
MP Elevation	NA	**Pump Intake (ft-bmp)**	68	**Purge Method:**	Low-Flow	**Sample Method**	Grab
Sample Time:	15:25	**Gallons Purged**	2.50	**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	14:50						
Purge End:	15:25						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:55	0	125	62.91	0.11	7	1.76	16.5	1.43	12.9	-12.3	Clear	None
15:00	5	125	62.94	0.21	7.02	1.78	40	0.3	13	-28.1	Clear	None
15:05	5	125	62.9	0.32	7.03	1.78	38.8	0.23	13	-36.5	Clear	None
15:10	5	125	62.86	0.42	7.03	1.78	33.4	0.31	13.1	-41.5	Clear	None
15:15	5	125	62.9	0.53	7.03	1.77	32.8	0.51	13	-43.1	Clear	None
15:20	5	125	62.9	0.63	7.03	1.76	30.3	0.43	13	-44.4	Clear	None
15:25	5	125	62.95	0.74	7.04	1.71	27.6	0.44	13	-45.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Anyssa Schember

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-74			**Date**	6/5/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	62.58	**Total Depth (ft-bmp)**	75	**Water Column(ft)**	12	**Gallons in Well**	2.02
MP Elevation		**Pump Intake (ft-bmp)**	72	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	13:40	**Volumes Purged**	1.73	**Sample ID**	MW-16-74_060520	**Sampled by**	D. Stockard
Purge Start	12:40	**Gallons Purged**	3.50				
Purge End	13:40			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:40		200	62.58	0.00	6.86	2.37	558	0.71	19.6	87.6	None	None
12:50	10	200	62.59	0.00	6.9	2.26	501	0.63	18.4	62.3	None	None
12:55	5	200	62.62	0.00	6.92	2.24	355	0.6	18.4	56.2	None	None
13:00	5	200	62.62	0.00	6.93	2.14	163	0.45	17.7	36.6	None	None
13:05	5	200	62.53	0.00	6.95	2.12	93.3	0.42	17.5	31.3	None	None
13:10	5	200	62.56	0.00	6.96	2.07	57.4	0.42	16.7	24.4	None	None
13:20	10	200	62.57	0.00	7	2.03	29	0.47	17	6.2	None	None
13:25	5	200	62.64	0.00	7.01	2.02	24.2	0.48	16.1	1.3	None	None
13:30	5	200	62.64	0.00	7	2.01	22.2	0.48	16.5	-6.3	None	None
13:35	5	200	62.64	0.00	6.98	2.04	19.3	0.49	16.3	-7.9	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-74			**Date**	09/01/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	73.0 degrees F and Cloudy. The wind is blowing W at 20.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	61.30	**Total Depth (ft-bmp)**	73.65	**Water Column(ft)**	12.35	**Gallons in Well**	2.01
MP Elevation		**Pump Intake (ft-bmp)**	71.15	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:10	**Volumes Purged**		**Sample ID**	MW-16-74_090120	**Sampled by**	Austin Westhuis
Purge Start	12:40	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	13:12						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:45	0	0	100	61.30	0.13	7.1	1.6	31.1	0.21	15.7	23.2	--	--
12:50	5	5	100	61.30	0.26	7.1	1.6	15.7	0.17	15.8	-5.3	--	--
12:55	5	10	100	61.30	0.40	7.09	1.59	4.31	0.16	15.6	-5.4	--	--
13:00	5	15	100	61.30	0.53	7.08	1.58	2.7	0.16	15.6	-5.6	--	--
13:05	5	20	100	61.30	0.66	7.07	1.58	2.29	0.15	15.5	-5.8	--	--
13:10	5	25	100	61.30	0.79	7.07	1.57	1.98	0.15	15.5	-6.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-16-74			**Date**	12/1/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cold, windy
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	61.7	**Total Depth (ft-bmp)**	75	**Water Column(ft)**	13.3	**Gallons in Well**	2.16
MP Elevation	NA	**Pump Intake (ft-bmp)**	72	**Purge Method:**	Low-Flow	**Sample Method**	Grab
Sample Time:	11:00	**Gallons Purged**		**Replicate/ Code No.**	MS/MSD	**Evacuation Method**	Bladder
Purge Start:	09:45						
Purge End:	10:55						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:55	0	200	61.75	0.00	6.98	2.19	565	0.57	12.3	-46.5	Cloudy/gray	None
10:00	5	200	61.75	0.00	7.07	2.18	974	0.14	12.4	-76.8	Cloudy/gray	None
10:05	5	200	61.75	0.00	7.07	2.18	955	0.11	12.3	-76.2	Cloudy/gray	None
10:10	5	200	61.75	0.00	7.05	2.17	907	0.12	12.3	-73.3	Cloudy/gray	None
10:15	5	200	61.75	0.00	7.07	2.15	757	0.18	12.3	-68	Cloudy/gray	None
10:20	5	200	61.75	0.00	7.06	2.11	707	0.21	12.5	-61	Cloudy/gray	None
10:25	5	200	61.75	0.00	7.09	2.1	883	0.26	12.3	-59.4	Cloudy/gray	None
10:30	5	200	61.75	0.00	7.05	2.06	875	0.4	12.1	-50.8	Cloudy/gray	None
10:35	5	200	61.75	0.00	7.08	2.03	747	0.57	12	-47.4	Cloudy/gray	None
10:40	5	200	61.75	0.00	7.07	2.02	646	0.59	12.1	-46.3	Cloudy/gray	None
10:45	5	200	61.75	0.00	7.09	2.01	596	0.6	12.1	-46.6	Cloudy/gray	None
10:50	5	200	61.75	0.00	7.09	2.01	560	0.62	12.3	-43.9	Cloudy/gray	None
10:55	5	200	61.75	0.00	7.11	2.01	578	0.62	12.1	-45.1	Cloudy/gray	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments: Purged for over an hour and turbidity was still high. Confirmed w/Austin and collected sample

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-75			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	58.69	**Total Depth (ft-bmp)**	74.9	**Water Column(ft)**	16	**Gallons in Well**	2.63
MP Elevation		**Pump Intake (ft-bmp)**	72	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	14:30	**Volumes Purged**	1.52	**Sample ID**	MW-16-75_060820	**Sampled by**	D. Stockard
Purge Start	13:15	**Gallons Purged**	4.00				
Purge End	14:30			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:15		200	58.69	0.00	6.91	2.14	345	0.67	15.2	27.8	None	None
13:25	10	200	60.42	0.00	6.93	2.16	221	0.71	15.4	24.1	None	None
13:35	10	200	61.46	0.00	6.98	2.14	145	0.62	15.1	11.5	None	None
13:40	5	200	61.62	0.00	6.98	2.17	120	0.81	14.9	5.6	None	None
13:50	10	200	61.99	0.00	7.03	2.17	65.5	0.58	15.6	-9.9	None	None
14:30	40	200	62.75	0.00	7.07	2.15	65.2	0.32	16.1	-38.5	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-16-75			**Date**	12/4/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cold, overcast
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	59.86	**Total Depth (ft-bmp)**	75.2	**Water Column(ft)**	15.34	**Gallons in Well**	2.49
MP Elevation	NA	**Pump Intake (ft-bmp)**	72	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	13:40	**Gallons Purged**		**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	12:50						
Purge End:	13:35						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:00	0	200	60.9	0.00	6.99	2.1	45.9	0.29	12	-77.5	Clear	None
13:05	5	200	61.56	0.00	7.04	2.09	87.3	0.13	12	-82.3	Clear	None
13:10	5	200	61.95	0.00	7.07	2.1	102	0.08	12.1	-85.1	Clear	None
13:15	5	200	62.02	0.00	7.08	2.11	138	0.06	12	-86	Clear	None
13:20	5	200	62.02	0.00	7.09	2.11	175	0.06	11.9	-86.6	Clear	None
13:25	5	200	62.02	0.00	7.09	2.11	156	0.06	11.9	-86.7	Clear	None
13:30	5	200	62.02	0.00	7.1	2.1	145	0.05	11.9	-88.9	Clear	None
13:35	5	200	62.02	0.00	7.11	2.11	456	0.06	12	-88.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-76			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	60.74	**Total Depth (ft-bmp)**	83.5	**Water Column(ft)**	23	**Gallons in Well**	3.7
MP Elevation		**Pump Intake (ft-bmp)**	80.5	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	17:40	**Volumes Purged**	0.68	**Sample ID**	MW-16-76_060820	**Sampled by**	D. Stockard
Purge Start	16:40	**Gallons Purged**	2.50				
Purge End	17:40			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
16:40		200	60.74	0.00	6.98	2.03	51.3	4.02	16.5	42.4	None	None
16:45	5	200	61.72	0.00	6.95	2.05	509	1.22	16.1	38.1	None	None
17:00	15	200	63.45	0.00	7.08	1.9	80.6	0.67	14.1	10.8	None	None
17:05	5	200	63.78	0.00	7.08	1.89	56.9	0.93	14.9	4.5	None	None
17:10	5	200	63.78	0.00	7.12	1.89	33.8	0.37	14.1	-8.4	None	None
17:15	5	200	64.67	0.00	7.13	1.89	23.6	0.37	14.2	-10.1	None	None
17:20	5	200	65.02	0.00	7.15	1.89	15.2	0.34	14.6	-20	None	None
17:25	5	200	65.36	0.00	7.14	1.89	12.8	0.3	14.6	-23.9	None	None
17:30	5	200	65.47	0.00	7.17	1.92	12	0.28	13.9	-27.8	None	None
17:35	5	200	65.47	0.00	7.18	1.95	10.9	0.29	14	-31.8	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-77			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	57.53	**Total Depth (ft-bmp)**	75.2	**Water Column(ft)**	18	**Gallons in Well**	2.87
MP Elevation		**Pump Intake (ft-bmp)**	72	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	16:05	**Volumes Purged**	0.70	**Sample ID**	MW-16-77_060820	**Sampled by**	D. Stockard
Purge Start	15:00	**Gallons Purged**	2.00				
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:05		200	57.53	0.00	6.96	2.16	573	2.23	17.6	-4.6	None	None
15:20	15	200	59.93	0.00	6.98	2.25	240	2.04	18.9	-25.9	None	None
15:30	10	200	59.93	0.00	7.1	2.23	183	1.85	18.9	-52	None	None
15:35	5	200	61.91	0.00	7.11	2.22	121	1.93	18.4	-56.2	None	None
15:45	10	200	61.91	0.00	7.11	2.17	38.4	1.71	18.2	-64.4	None	None
15:55	10	200	64.55	0.00	7.16	2.14	48.9	0.74	19	-71.2	None	None
16:00	5	200	64.81	0.00	7.15	2.14	35	0.74	18.8	-70.9	None	None
16:03	3	200	65.22	0.00	7.13	2.14	32.9	0.74	18.8	-69.2	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-16-77			**Date**	12/4/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cold, cloudy
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	58.9	**Total Depth (ft-bmp)**	74	**Water Column(ft)**	15.1	**Gallons in Well**	2.45
MP Elevation	NA	**Pump Intake (ft-bmp)**	70	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	14:40	**Gallons Purged**		**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	13:55						
Purge End:	14:33						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:10	0	200	60.25	0.00	7.06	2.45	6.48	0.36	10.9	-61.6	Clear	None
14:15	5	200	60.25	0.00	7.09	2.35	0.35	0.23	11	-66.7	Clear	None
14:20	5	200	60.25	0.00	7.12	2.28	0.02	0.17	10.9	-64.4	Clear	None
14:25	5	200	60.25	0.00	7.15	2.26	0.02	0.26	10.6	-63.3	Clear	None
14:30	5	200	60.25	0.00	7.15	2.24	0.02	0.25	11.1	-61.1	Clear	None
14:35	5	200	60.25	0.00	7.17	2.24	0.02	0.26	11.1	-60.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-78			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	61.11	**Total Depth (ft-bmp)**	77	**Water Column(ft)**	16	**Gallons in Well**	2.58
MP Elevation		**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	#Error	**Volumes Purged**	1.16	**Sample ID**	MW-16-78_060920	**Sampled by**	D. Stockard
Purge Start	14:25	**Gallons Purged**	3.00				
Purge End	15:15			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:25		200	61.11	0.00	6.8	1.82	132	0.97	18.5	28.4	None	None
14:30	5	200	61.114	0.00	6.81	1.82	68.1	0.67	18.5	16.7	None	None
14:40	10	200	61.17	0.00	6.86	1.82	34.7	0.38	17.9	-24.2	None	None
14:50	10	200	61.17	0.00	6.91	1.82	22.7	0.3	18.1	-45.9	None	None
14:55	5	200	61.12	0.00	6.94	1.81	19.3	0.35	18.2	-50	None	None
15:05	10	200	61.12	0.00	6.97	1.82	6.21	0.28	18	-60	None	None
15:10	5	200	61.12	0.00	6.94	1.81	6.91	0.27	18.1	-61.5	None	None
15:15	5	200	61.12	0.00	6.95	1.81	6.22	0.26	18.4	-63.4	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-16-78			**Date**	12/7/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cold, cloudy
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	61.78	**Total Depth (ft-bmp)**	77	**Water Column(ft)**	15.22	**Gallons in Well**	2.47
MP Elevation	NA	**Pump Intake (ft-bmp)**	73	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	11:00	**Gallons Purged**		**Replicate/ Code No.**	Dup-05_120720	**Evacuation Method**	Bladder
Purge Start:	10:15						
Purge End:	10:55						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:25	0	200	61.8	0.00	6.9	1.72	19.7	0.42	11.3	-56.6	Clear	None
10:30	5	200	61.8	0.00	6.94	1.72	12.2	0.24	11.1	-59.5	Clear	None
10:35	5	200	61.8	0.00	6.94	1.72	8.05	0.23	11.3	-59.8	Clear	None
10:40	5	200	61.8	0.00	6.99	1.72	4.01	0.17	11.2	-62.7	Clear	None
10:45	5	200	61.8	0.00	7	1.72	3.21	0.16	11.3	-62.5	Clear	None
10:50	5	200	61.8	0.00	6.99	1.72	2.01	0.15	11.1	-62.1	Clear	None
10:55	5	200	61.8	0.00	6.99	1.73	0.02	0.14	11.2	-62.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-79			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	61.65	**Total Depth (ft-bmp)**	77.2	**Water Column(ft)**	16	**Gallons in Well**	2.53
MP Elevation		**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	12:25	**Volumes Purged**	0.99	**Sample ID**	MW-16-79_060920	**Sampled by**	D. Stockard
Purge Start	10:50	**Gallons Purged**	2.50				
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:50		200	61.65	0.00	6.8	0.94	222	1.75	17.8	103.3	None	None
11:00	10	200	63.25	0.00	6.82	0.94	584	1.59	17.1	90.9	None	None
11:05	5	200	64.15	0.00	6.91	0.94	312	1.41	17.4	63.4	None	None
11:10	5	200	64.45	0.00	6.98	0.93	373	1.68	18.1	49.2	None	None
11:15	5	200	65.11	0.00	7.09	0.93	268	0.55	18.3	19.7	None	None
11:25	10	200	65.11	0.00	7.14	0.93	128	0.43	19.1	-30.3	None	None
11:30	5	200	66.95	0.00	7.19	0.93	123	0.44	18.8	-41.7	None	None
11:40	10	200	66.95	0.00	7.08	0.93	68.4	0.41	18.3	-44.1	None	None
12:20	40	200	67.91	0.00	7.14	0.94	50.7	0.79	19.2	-70.9	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-16-79			**Date**	12/7/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cold, overcast
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	63.02	**Total Depth (ft-bmp)**	76.5	**Water Column(ft)**	13.48	**Gallons in Well**	2.19
MP Elevation	NA	**Pump Intake (ft-bmp)**	72	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	09:50	**Gallons Purged**		**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	08:55						
Purge End:	09:45						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:10	0	200	64.1	0.00	6.96	0.82	29.7	0.49	10.1	-49.6	Clear	None
09:15	5	200	64.1	0.00	7.02	0.82	25.8	0.42	10.1	-65	Clear	None
09:20	5	200	64.1	0.00	7.04	0.81	22.3	0.4	10	-65.4	Clear	None
09:25	5	200	64.1	0.00	7.06	0.8	20	0.38	10.4	-67.6	Clear	None
09:30	5	200	64.1	0.00	7.23	0.82	15.3	0.35	10.9	-79.5	Clear	None
09:35	5	200	64.1	0.00	7.19	0.81	9.01	0.34	10.8	-76.6	Clear	None
09:40	5	200	64.1	0.00	7.2	0.82	8.08	0.36	11	-76.1	Clear	None
09:45	5	200	64.1	0.00	7.24	0.82	7.76	0.34	11	-78.8	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant2

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-80			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 70's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	55.79	**Total Depth (ft-bmp)**	74.2	**Water Column(ft)**	18	**Gallons in Well**	2.99
MP Elevation		**Pump Intake (ft-bmp)**	71.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:40	**Volumes Purged**	0.49	**Sample ID**	MW-16-80_060820	**Sampled by**	Billy J Cobern
Purge Start	09:45	**Gallons Purged**	1.45				
Purge End	10:40			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:45		100	55.79	0.00							Clear	No
09:50	5	100	56.08	0.13	7.1	1.1	67.9	3.91	16	53.8	Clear	No
09:55	5	100	56.19	0.26	7.08	1.22	63.5	1.86	15.1	20.8	Clear	No
10:00	5	100	56.16	0.40	7.09	1.22	56.7	1.48	15.6	-0.9	Clear	No
10:05	5	100	56.16	0.53	7.09	1.23	41.2	1.48	15.9	-6.4	Clear	No
10:10	5	100	56.12	0.66	7.09	1.24	29.1	1.39	16.3	-17.9	Clear	No
10:15	5	100	56.12	0.79	7.09	1.24	22.3	1.44	16.3	-19.8	Clear	No
10:20	5	100	56.12	0.92	7.08	1.24	17.9	1.48	16.5	-21.9	Clear	No
10:25	5	100	56.12	1.06	7.08	1.24	14.2	1.35	16.6	-23.7	Clear	No
10:30	5	100	56.12	1.19	7.08	1.24	10.2	1.3	16.7	-25.6	Clear	No
10:35	5	100	56.12	1.32	7.08	1.24	9.92	1.3	16.6	-27.4	Clear	No
10:40	5	100	56.12	1.45	7.08	1.25	9.91	1.31	16.6	-29.1	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	40 mL Glass	3	HCL

Comments: Both tabs broken

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

Condition of Well: OK

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Flush mount

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-80			**Date**	12/04/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	59.16	**Total Depth (ft-bmp)**	73.4	**Water Column(ft)**	14.24	**Gallons in Well**	2.31
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:15	**Volumes Purged**	0.43	**Sample ID**	MW-16-80	**Sampled by**	Donald Richmond
Purge Start	09:30	**Gallons Purged**	1.00	**Replicate/ Code No.**			
Purge End	10:30						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:40	0	0	100	59.16	--	6.62	1.83	96.2	0.47	8.6	-50.9	--	--
09:45	5	5	100	59.16	--	6.63	1.86	85.1	0.43	9.2	-54.2	--	--
09:50	5	10	100	59.16	--	6.65	1.89	57.9	0.31	9.5	-57.3	--	--
09:55	5	15	100	59.16	--	6.68	1.89	37	0.23	9.5	-62.7	--	--
10:00	5	20	100	59.16	--	6.7	1.88	31	0.21	9.5	-65.1	--	--
10:05	5	25	100	59.16	--	6.7	1.88	27.7	0.19	9.4	-66.1	--	--
10:10	5	30	100	59.16	--	6.71	1.88	24.6	0.2	9.4	-66.9	--	--
10:15	5	35	100	59.16	--	6.71	1.88	23.6	0.19	9.4	-67.5	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	9	HCL

Comments: MSMSD Taken

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-16-81	**Date**	3/2/2020
Project Name/Location	RACER Lansing, MI			**Weather(°F)**	Sunny, 45°

Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	63.04	**Total Depth (ft-bmp)**	77.28	**Water Column(ft)**	14.24	**Gallons in Well**	2.31
MP Elevation	NA	**Pump Intake (ft-bmp)**	72	**Purge Method:**	Low-Flow	**Sample Method**	Grab
Sample Time: 16:35 **Purge Start:** 15:55 **Purge End:** 16:35		**Gallons Purged**	3.00	**Replicate/ Code No.**	DUP-01	**Evacuation Method**	Bladder

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
16:00	0	150	63.55	0.11	7.07	1.32	10.3	1.05	13.7	-59.8	Clear	None
16:05	5	150	63.8	0.26	7.07	1.32	4.86	0.27	13.7	-68.1	Clear	None
16:10	5	150	63.95	0.40	7.07	1.32	9.69	0.15	13.8	-71.5	Clear	None
16:15	5	150	64	0.53	7.07	1.32	23.5	0.19	13.7	-73.6	Clear	None
16:20	5	150	64.01	0.66	7.07	1.31	26.3	0.23	13.6	-74	Clear	None
16:25	5	150	63.98	0.79	7.07	1.31	25.9	0.34	13.7	-73.9	Clear	None
16:30	5	150	64	0.92	7.07	1.31	23.5	0.37	13.6	-73.1	Clear	None
16:35	5	150	64	1.06	7.07	1.31	22.9	0.4	13.6	-72.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	6	HCL

Sampling By Anyssa Schember

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-81			**Date**	6/5/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	62.54	**Total Depth (ft-bmp)**	77.3	**Water Column(ft)**	15	**Gallons in Well**	2.4
MP Elevation		**Pump Intake (ft-bmp)**	74	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	14:45	**Volumes Purged**	1.04	**Sample ID**	MW-16-81_060520	**Sampled by**	D. Stockard
Purge Start	14:00	**Gallons Purged**	2.50				
Purge End	#Error			**Replicate/ Code No.**	DUP-02		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:00		200	62.54	0.00	6.95	1.65	339	0.54	17.2	-45.3	None	None
14:10	10	200	63.07	0.00	6.96	1.64	173	0.48	17.1	-50.8	None	None
14:15	5	200	63.15	0.00	6.96	1.63	105	0.38	17.8	-55.4	None	None
14:20	5	200	63.26	0.00	7.04	1.63	67.1	0.31	18.3	-67	None	None
14:25	5	200	63.06	0.00	7.12	1.64	52.3	0.26	19.1	-80.1	None	None
14:30	5	200	63.05	0.00	7.1	1.65	18.4	0.26	18.7	-83.2	None	None
14:35	5	200	63.07	0.00	7.08	1.67	20.2	0.26	18.5	-84	None	None
14:40	5	200	63.06	0.00	7.05	1.65	19.7	0.26	18.7	-81.3	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-81			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 93F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	124.88	**Total Depth (ft-bmp)**	154.5	**Water Column(ft)**	30	**Gallons in Well**	4.81
MP Elevation		**Pump Intake (ft-bmp)**	148.7	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:00	**Volumes Purged**		**Sample ID**	MW-16-81_060920	**Sampled by**	Austin Westhuis
Purge Start	23:30	**Gallons Purged**	2.50				
Purge End	12:05			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:35		200	62.34	0.26	7	1.37	21.9	0.02	16.2	-89.5	Clear	None
11:40	5	200	62.34	0.53	7.02	1.34	14.5	0.01	15.8	-90.9	Clear	None
11:45	5	200	62.34	0.79	7	1.35	5.29	0.02	15.8	-90.4	Clear	None
11:50	5	200	62.34	1.06	6.99	1.34	2.42	0.01	15.6	-87.5	Clear	None
11:55	5	200	62.34	1.32	6.98	1.35	2.31	0.01	15.6	-86.1	Clear	None
12:00	5	200	62.34	1.59	6.97	1.37	2.19	0.01	15.5	-86.3	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-81			**Date**	09/02/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	69.1 degrees F and Fog/Mist. The wind is blowing SW at 37.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	60.52	**Total Depth (ft-bmp)**	77.2	**Water Column(ft)**	16.68	**Gallons in Well**	2.71
MP Elevation		**Pump Intake (ft-bmp)**	74.7	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:25	**Volumes Purged**		**Sample ID**	MW-16-81_090220	**Sampled by**	Austin Westhuis
Purge Start	10:00	**Gallons Purged**		**Replicate/ Code No.**	Dup-02		
Purge End	10:29						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:05	0	0	100	61.70	0.13	6.79	2.64	47.8	0.28	16.6	-46.5	--	--
10:10	5	5	100	61.95	0.26	6.78	2.68	14.6	0.19	16.7	-48.4	--	--
10:15	5	10	100	61.95	0.40	6.78	2.69	3.38	0.17	16.8	-49	--	--
10:20	5	15	100	61.95	0.53	6.78	2.69	3.13	0.16	16.7	-50.6	--	--
10:25	5	20	100	61.95	0.66	6.78	2.7	2.61	0.16	16.6	-50.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-16-81			**Date**	12/3/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Sunny, cold
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	63.81	**Total Depth (ft-bmp)**	75	**Water Column(ft)**	11.19	**Gallons in Well**	1.82
MP Elevation	NA	**Pump Intake (ft-bmp)**	72	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	11:30	**Gallons Purged**		**Replicate/ Code No.**	DUP-02_120320	**Evacuation Method**	Bladder
Purge Start:	10:40						
Purge End:	11:15						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:50	0	200	64.75	0.00	6.8	2.23	0.02	0.37	12.6	-30.9	Clear	None
10:55	5	200	64.9	0.00	6.71	2.91	0.02	0.32	12.2	-20.1	Clear	None
11:00	5	200	64.9	0.00	6.7	3.13	0.02	0.25	12.6	-14.3	Clear	None
11:05	5	200	64.9	0.00	6.73	3.21	0.02	0.22	12.4	-13.4	Clear	None
11:10	5	200	64.9	0.00	6.75	3.22	0.02	0.24	12.7	-14.4	Clear	None
11:15	5	200	64.9	0.00	6.75	3.23	0.02	0.23	12.4	-13	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL
PFAS	250 mL Plastic	2	None

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-82			**Date**	6/10/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.1	**Total Depth (ft-bmp)**	77.1	**Water Column(ft)**	14	**Gallons in Well**	2.27
MP Elevation		**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:20	**Volumes Purged**		**Sample ID**	MW-16-82_061020	**Sampled by**	Jacob Pisarkiewicz
Purge Start	11:50	**Gallons Purged**					
Purge End	12:15			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:55		200	63.5	0.00	7.08	1.2	1.24	0.57	20.9	-99.9	Clear	None
12:00	5	200	63.5	0.00	7.04	1.2	0.02	0.41	20.7	-100.1	Clear	None
12:05	5	200	63.5	0.00	7.01	1.2	0.25	0.38	20.4	-98.9	Clear	None
12:10	5	200	63.5	0.00	7.06	1.19	0.02	0.38	21.1	-100.1	Clear	None
12:15	5	200	63.5	0.00	7.09	1.2	0.02	0.36	21.5	-102.3	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-82			**Date**	12/04/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	63.03	**Total Depth (ft-bmp)**	87	**Water Column(ft)**	23.97	**Gallons in Well**	3.89
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:55	**Volumes Purged**	0.26	**Sample ID**	MW-16-82	**Sampled by**	Donald Richmond
Purge Start	12:20	**Gallons Purged**	1.00	**Replicate/ Code No.**			
Purge End	13:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:30	0	0	100	63.03	--	7.09	0.77	54.5	2.71	6.3	-31.9	--	--
12:35	5	5	100	63.03	--	7.06	0.78	50.5	1.03	7	-56.3	--	--
12:40	5	10	100	63.03	--	7.06	0.78	43.1	0.65	7.4	-60.9	--	--
12:45	5	15	100	63.03	--	7.05	0.79	46.8	0.34	7.6	-71.1	--	--
12:50	5	20	100	63.03	--	7.05	0.79	48.3	0.29	7.2	-74.3	--	--
12:55	5	25	100	63.03	--	7.05	0.79	47.8	0.27	7.3	-75.9	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-83			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 80's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.12	**Total Depth (ft-bmp)**	79.03	**Water Column(ft)**	15	**Gallons in Well**	2.42
MP Elevation		**Pump Intake (ft-bmp)**	61.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:40	**Volumes Purged**	0.55	**Sample ID**	MW-16-83	**Sampled by**	Billy J Cobern
Purge Start	12:50	**Gallons Purged**	1.32				
Purge End	13:40			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:50		100	64.12	0.00							Clear	No
12:55	5	100	64.42	0.13	7.18	4.03	139	5.68	25.3	91.9	Clear	No
13:00	5	100	64.59	0.26	6.94	4.12	99.7	3.04	24.4	25.9	Clear	No
13:05	5	100	64.69	0.40	6.9	4.15	88.8	1.58	23.5	-11.8	Clear	No
13:10	5	100	64.69	0.53	6.89	4.15	70.3	1.08	23.1	-35.9	Clear	No
13:15	5	100	64.69	0.66	6.89	4.15	63.6	0.65	22.2	-53.1	Clear	No
13:20	5	100	64.69	0.79	6.89	4.13	58.2	0.47	22.1	-60.2	Clear	No
13:25	5	100	64.69	0.92	6.89	4.13	53.4	0.46	22.2	-62	Clear	No
13:30	5	100	64.69	1.06	6.89	4.13	49.8	0.4	22.4	-63.8	Clear	No
13:35	5	100	64.69	1.19	6.89	4.14	46.8	0.41	22.4	-65	Clear	No
13:40	5	100	64.69	1.32	6.89	4.14	47.6	0.4	22.4	-65.6	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-16-84			**Date**	3/4/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 34°
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	65.16	**Total Depth (ft-bmp)**	81.18	**Water Column(ft)**	16.02	**Gallons in Well**	2.6
MP Elevation	NA	**Pump Intake (ft-bmp)**	73	**Purge Method:**	Low-Flow	**Sample Method**	Grab
Sample Time:	09:10	**Gallons Purged**	2.00	**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	08:35						
Purge End:	09:10						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:40	0	125	65.45	0.13	6.64	0.83	77.6	6.04	8.9	136.2	Clear	None
08:45	5	125	66.03	0.26	6.92	0.87	56.6	0.46	11.9	71.7	Clear	None
08:50	5	125	66.29	0.40	7.04	0.9	38.8	0.41	12	53.2	Clear	None
08:55	5	125	66.59	0.53	7.09	0.94	27.7	0.27	12.1	35	Clear	None
09:00	5	125	66.63	0.66	7.09	0.96	12.3	0.23	12.1	26.6	Clear	None
09:05	5	125	66.74	0.79	7.11	0.98	11	0.2	12	17.8	Clear	None
09:10	5	125	66.82	0.92	7.1	0.98	12	0.21	12.1	13.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Anyssa Schember

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-84			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 70s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.9	**Total Depth (ft-bmp)**	82.7	**Water Column(ft)**	18	**Gallons in Well**	2.89
MP Elevation		**Pump Intake (ft-bmp)**	79	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	10:50	**Volumes Purged**	1.21	**Sample ID**	MW-16-84_060420	**Sampled by**	D. Stockard
Purge Start	09:50	**Gallons Purged**	3.50				
Purge End	10:50			**Replicate/ Code No.**	DUP-03		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:50		200	64.9	0.00	6.92	1.31	169	0.7	15.3	20.8	None	None
10:00	10	200	66.01	0.00	6.92	1.32	187	0.67	15.1	15.5	None	None
10:15	15	200	66.34	0.00	7.06	1.34	116	0.63	15.5	-8.6	None	None
10:20	5	200	66.34	0.00	7.08	1.35	98.3	0.49	15.5	-11.3	None	None
10:25	5	200	66.41	0.00	7.07	1.35	77.1	0.56	15.2	-15.7	None	None
10:30	5	200	66.41	0.00	7.1	1.33	55.4	0.65	15.3	-19.9	None	None
10:35	5	200	66.41	0.00	7.08	1.35	35.1	0.65	15.5	-23.9	None	None
10:40	5	200	66.69	0.00	7.08	1.36	26	0.62	15.7	-29.2	None	None
10:45	5	200	66.75	0.00	7.08	1.35	23.6	0.63	15.4	-30.8	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D and VOCs	40 mL Glass	6	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-84			**Date**	09/01/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**	66.9 degrees F and Cloudy. The wind is blowing S/SW at 20.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.29	**Total Depth (ft-bmp)**	81.2	**Water Column(ft)**	15.91	**Gallons in Well**	2.59
MP Elevation		**Pump Intake (ft-bmp)**	78	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:55	**Volumes Purged**	0.56	**Sample ID**	MW-16-84_090120	**Sampled by**	Billy Cobern
Purge Start	10:05	**Gallons Purged**	1.45	**Replicate/ Code No.**			
Purge End	11:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:05	0	0	100	65.29	0.00							--	--
10:10	5	5	100	65.39	0.13	7.37	0.64	63.9	3.98	21.1	2.4	--	--
10:15	5	10	100	65.53	0.26	7.21	1.35	67.1	2.06	19.9	-24.5	--	--
10:20	5	15	100	65.53	0.40	7.15	1.37	58.3	0.86	19.1	-43.6	--	--
10:25	5	20	100	65.53	0.53	7.14	1.37	53.7	0.68	18.9	-50.1	--	--
10:30	5	25	100	65.53	0.66	7.13	1.37	43.2	0.71	18.9	-53.8	--	--
10:35	5	30	100	65.53	0.79	7.13	1.36	36.7	0.45	18.5	-58.6	--	--
10:40	5	35	100	65.53	0.92	7.13	1.36	25.7	0.39	18.3	-60	--	--
10:45	5	40	100	65.53	1.06	7.13	1.36	18.9	0.41	18.3	-60.4	--	--
10:50	5	45	100	65.53	1.19	7.13	1.36	17.4	0.4	18.2	-60.8	--	--
10:55	5	50	100	65.53	1.32	7.13	1.36	17.2	0.39	18.2	-61.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL

Comments: O2=20.9, CO=0, H2S=0, LEL=0, PID=0

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-16-84			**Date**	12/1/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cold, windy
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	65.7	**Total Depth (ft-bmp)**	81.7	**Water Column(ft)**	16	**Gallons in Well**	2.6
MP Elevation	NA	**Pump Intake (ft-bmp)**	77	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	12:35	**Gallons Purged**		**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	11:30						
Purge End:	12:35						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:45	0	200	66.54	0.00	7.16	1.16	0.2	0.37	11.2	8.8	Clear	None
11:50	5	200	66.7	0.00	7.15	1.2	22.6	0.27	11.5	-54	Clear	None
11:55	5	200	66.7	0.00	7.15	1.21	26.3	0.23	11.6	-59.3	Clear	None
12:00	5	200	66.7	0.00	7.18	1.25	32.5	0.16	11.5	-72.9	Clear	None
12:05	5	200	66.7	0.00	7.11	1.28	38.6	0.16	11.4	-76	Clear	None
12:10	5	200	66.7	0.00	7.12	1.29	35.7	0.18	11.3	-79.8	Clear	None
12:15	5	200	66.7	0.00	7.14	1.31	41.1	0.16	11.5	-83.7	Clear	None
12:20	5	200	66.7	0.00	7.14	1.32	47.6	0.12	11.3	-85.1	Clear	None
12:25	5	200	66.7	0.00	7.14	1.34	41.6	0.11	11.3	-87.7	Clear	None
12:30	5	200	66.7	0.00	7.08	1.32	40.8	0.11	11.5	-86.6	Clear	None
12:35	5	200	66.7	0.00	7.15	1.32	41.4	0.1	11.6	-88	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-85			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.49	**Total Depth (ft-bmp)**	83.1	**Water Column(ft)**	18	**Gallons in Well**	2.86
MP Elevation		**Pump Intake (ft-bmp)**	79	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	09:50	**Volumes Purged**		**Sample ID**	MW-16-85_060820	**Sampled by**	D. Stockard
Purge Start	08:40	**Gallons Purged**					
Purge End	09:50			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:45		200	65.49	0.00	6.91	1.1	423	1.91	15.6	168.3	None	None
09:30	45	200	71.14	0.00	7.26	1.12	132	0.46	15.7	-27.6	None	None
09:35	5	200	71.14	0.00	7.26	1.11	130	0.46	15.8	-30.3	None	None
09:40	5	200	71.39	0.00	7.25	1.11	125	0.48	15.8	-34.9	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D and VOCs	40 mL Glass	9	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-16-85			**Date**	12/04/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	66.90	**Total Depth (ft-bmp)**	82.65	**Water Column(ft)**	15.75	**Gallons in Well**	2.56
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:30	**Volumes Purged**	0.39	**Sample ID**	MW-16-85	**Sampled by**	Donald Richmond
Purge Start	13:30	**Gallons Purged**	1.00	**Replicate/ Code No.**			
Purge End	14:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:45	0	0	100	66.90	--	7.27	0.62	154	2.28	6	18	--	--
13:50	5	5	100	66.90	--	7.24	0.63	212	1.58	6	-10.9	--	--
13:55	5	10	100	66.90	--	7.24	0.62	106	1.38	6.2	-29	--	--
14:00	5	15	100	66.90	--	7.24	0.61	71.1	0.8	6.3	-45.5	--	--
14:05	5	20	100	66.90	--	7.24	0.6	68.3	0.58	6.4	-53.4	--	--
14:10	5	25	100	66.90	--	7.23	0.6	36	0.51	6.7	-61.5	--	--
14:15	5	30	100	66.90	--	7.23	0.59	27.2	0.63	6.8	-65.9	--	--
14:20	5	35	100	66.90	--	7.22	0.59	25.9	0.43	6.7	-69.2	--	--
14:25	5	40	100	66.90	--	7.22	0.59	23	0.4	6.7	-70.3	--	--
14:30	5	45	100	66.90	--	7.22	0.6	24.9	0.4	6.8	-72.6	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-17-86			**Date**	3/4/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 36°
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	63.79	**Total Depth (ft-bmp)**	81.44	**Water Column(ft)**	17.65	**Gallons in Well**	2.87
MP Elevation	NA	**Pump Intake (ft-bmp)**	74	**Purge Method:**	Low-Flow	**Sample Method**	Grab
Sample Time: 10:10 **Purge Start:** 09:40 **Purge End:** 10:10		**Gallons Purged**	2.00	**Replicate/ Code No.**		**Evacuation Method**	Bladder

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:45	0	125	63.64	0.13	7.14	0.99	6.73	0.41	11.5	47.7	Clear	None
09:50	5	125	63.75	0.26	7.04	1.17	2.24	0.19	12.3	18.6	Clear	None
09:55	5	125	63.74	0.40	7	1.22	2.33	0.15	12.3	-2.1	Clear	None
10:00	5	125	63.65	0.53	6.99	1.24	1.69	0.13	12.2	-13.5	Clear	None
10:05	5	125	63.66	0.66	7	1.23	1.11	0.15	12	-21.5	Clear	None
10:10	5	125	63.66	0.79	6.99	1.23	0.76	0.15	11.9	-25.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL

Sampling By Anyssa Schember

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-17-86			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 70s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	62.82	**Total Depth (ft-bmp)**	82	**Water Column(ft)**	19	**Gallons in Well**	3.12
MP Elevation		**Pump Intake (ft-bmp)**	79	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	17:45	**Volumes Purged**		**Sample ID**	MW-17-86_060320	**Sampled by**	D. Stockard
Purge Start	16:40	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
16:40		100	62.82	0.00	6.63	1.73	129	2.21	18.2	64.3	None	None
16:45	5	100	63.05	0.00	6.64	1.75	107	0.54	17.9	20.4	None	None
16:50	5	200	62.95	0.00	6.91	1.78	82.3	0.61	18.4	-34.5	None	None
16:55	5	200	62.95	0.00	6.84	1.78	66.2	0.61	18	-34.2	None	None
17:05	10	200	62.99	0.00	6.82	1.76	93.7	1.18	18.1	-53.7	None	None
17:10	5	200	62.96	0.00	6.81	1.74	108	4.74	19.8	-62.9	None	None
17:35	25	200	62.89	0.00	6.79	0.94	132	2.16	19.9	-59.7	None	None
17:40	5	200	62.89	0.00	6.82	1.77	144	2.12	18.3	-60.3	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D and VOCs	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-17-86			**Date**	09/01/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**	64.9 degrees F and Cloudy. The wind is blowing S/SE at 12.1 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	62.34	**Total Depth (ft-bmp)**	81.4	**Water Column(ft)**	19.06	**Gallons in Well**	3.1
MP Elevation		**Pump Intake (ft-bmp)**	78	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:35	**Volumes Purged**	0.47	**Sample ID**	MW-17-86_090120	**Sampled by**	Billy Cobern
Purge Start	08:40	**Gallons Purged**	1.45	**Replicate/ Code No.**	MW-17-86_090120		
Purge End	09:45						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:40	0	0	100	62.34	0.00							--	--
08:45	5	5	100	62.44	0.13	7.41	1.55	186	5.25	20.5	-27.1	--	--
08:50	5	10	100	62.44	0.26	7.08	1.72	268	3.44	20	-46.1	--	--
08:55	5	15	100	62.44	0.40	6.97	1.82	194	1.34	19.1	-54.9	--	--
09:00	5	20	100	62.44	0.53	6.96	1.82	147	0.96	19	-56.8	--	--
09:05	5	25	100	62.44	0.66	6.96	1.82	131	0.95	19.1	-59.7	--	--
09:10	5	30	100	62.44	0.79	6.96	1.82	104	0.59	19.3	-62.1	--	--
09:15	5	35	100	62.44	0.92	6.97	1.82	89.4	0.56	19.4	-62.6	--	--
09:20	5	40	100	62.44	1.06	6.97	1.82	71.2	0.55	19.4	-62.7	--	--
09:25	5	45	100	62.44	1.19	6.97	1.82	63.7	0.57	19.4	-62.9	--	--
09:30	5	50	100	62.44	1.32	6.97	1.82	62.6	0.55	19.4	-63.1	--	--
09:35	5	55	100	62.44	1.45	6.97	1.82	63.8	0.53	19.4	-63.4	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	9	HCL

Comments: O2=20.9, CO=0, H2S=0, LEL=0, PID=0

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-17-86			**Date**	12/1/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cold, windy
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	62.73	**Total Depth (ft-bmp)**	82	**Water Column(ft)**	19.27	**Gallons in Well**	3.13
MP Elevation	NA	**Pump Intake (ft-bmp)**	78	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	14:35	**Gallons Purged**		**Replicate/ Code No.**		**Evacuation Method**	Bladder
Purge Start:	13:50						
Purge End:	14:30						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:05	0	200	62.8	0.00	7.03	1.58	0.2	0.27	12	-80.9	Clear	None
14:10	5	200	62.8	0.00	7.02	1.66	0.2	0.16	12.2	-88.4	Clear	None
14:15	5	200	62.8	0.00	7.01	1.72	0.2	0.14	11.8	-84.4	Clear	None
14:20	5	200	62.8	0.00	6.97	1.74	0.2	0.11	11.9	-81.9	Clear	None
14:25	5	200	62.8	0.00	6.99	1.75	0.02	0.1	11.8	-83.9	Clear	None
14:30	5	200	62.8	0.00	6.97	1.75	0.02	0.11	11.9	-83.7	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL
VOCs	40 mL Vial	3	HCL

Sampling By Jake Pisarkiewicz

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-17-87			**Date**	6/5/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Partly Cloudy, 80's
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	Steel
Static Water Level (ft-bmp)	64.8	**Total Depth (ft-bmp)**	119.34	**Water Column(ft)**	55	**Gallons in Well**	35.45
MP Elevation		**Pump Intake (ft-bmp)**	117	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:45	**Volumes Purged**	0.04	**Sample ID**	MW-17-87_060520	**Sampled by**	Billy J Cobern
Purge Start	10:45	**Gallons Purged**	1.59				
Purge End	11:45			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:45		100	64.8	0.00							Clear	No
10:50	5	100	64.81	0.13	7.34	2.78	43.4	0.65	26.2	-5.8	Clear	No
10:55	5	100	64.81	0.26	7.37	2.74	41.2	3.26	26.1	-52	Clear	No
11:00	5	100	64.81	0.40	7	2.75	37.7	3.82	27.1	-45.9	Clear	No
11:05	5	100	64.81	0.53	6.8	3.07	36.1	3.86	28	-77.2	Clear	No
11:10	5	100	64.81	0.66	6.81	3.35	28.3	3.76	27.7	-92	Clear	No
11:15	5	100	64.81	0.79	6.86	3.49	24.3	3.41	27.3	-111.6	Clear	No
11:20	5	100	64.81	0.92	6.93	3.53	21.2	3.32	26.9	-131.1	Clear	No
11:25	5	100	64.81	1.06	7.05	3.57	17.2	3.16	25.2	-147.8	Clear	No
11:30	5	100	64.81	1.19	7.07	3.58	13.2	3.21	24.8	-152.7	Clear	No
11:35	5	100	64.81	1.32	7.09	3.58	9.94	3.2	14.9	-156.6	Clear	No
11:40	5	100	64.81	1.45	7.1	3.57	9.83	3	24.7	-159.6	Clear	No
11:45	5	100	64.81	1.59	7.11	3.57	9.68	3	24.7	-162.1	Clear	No

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4 Dioxane	250 mL Amber	1	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-18-88			**Date**	3/2/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	3.34	**Total Depth (ft-bmp)**	15	**Water Column(ft)**	11.66	**Gallons in Well**	1.89
MP Elevation	NA	**Pump Intake (ft-bmp)**	13	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	16:50	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	16:30						
Purge End:	16:55						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
16:35	0	200	3.53	0.26	6.99	0.445	3.03	0.04	6.7	73.7	Clear	None
16:40	5	200	3.53	0.53	7.06	0.442	2.47	0.04	6.5	70.6	Clear	None
16:45	5	200	3.53	0.79	7.11	0.441	1.77	0.04	6.5	68.1	Clear	None
16:50	5	200	3.53	1.06	7.17	0.443	1.66	0.03	6.5	67.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-88			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.98	**Total Depth (ft-bmp)**	14.99	**Water Column(ft)**	10	**Gallons in Well**	1.63
MP Elevation		**Pump Intake (ft-bmp)**	12.49	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:30	**Volumes Purged**		**Sample ID**	MW-18-88_060420	**Sampled by**	Austin Westhuis
Purge Start	14:55	**Gallons Purged**					
Purge End	15:40			**Replicate/ Code No.**	Dup-06_060420		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:00		200	4.98	0.26	5.88	0.52	22.6	0.36	15.4	86.4	Clear	None
15:05	5	200	4.98	0.53	5.61	0.51	13.8	0.29	15.1	32.8	Clear	None
15:10	5	200	4.98	0.79	3.83	0.51	4.92	0.27	15	12.6	Clear	None
15:15	5	200	4.98	1.06	4.21	0.51	2.96	0.26	15	4.6	Clear	None
15:20	5	200	4.98	1.32	4.7	0.51	2.41	0.27	14.8	2.6	Clear	None
15:25	5	200	4.98	1.59	4.73	0.51	2.11	0.27	14.8	2.3	Clear	None
15:30	5	200	4.98	1.85	4.8	0.51	1.64	0.27	14.8	2.1	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-88 (resample for missed parameters)			**Date**	6/9/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.46	**Total Depth (ft-bmp)**	15	**Water Column(ft)**	10	**Gallons in Well**	1.55
MP Elevation		**Pump Intake (ft-bmp)**	13	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:30	**Volumes Purged**		**Sample ID**	MW-18-88_060920	**Sampled by**	Jacob Pisarkiewicz
Purge Start	14:55	**Gallons Purged**					
Purge End	15:25			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:05		200	5.46	0.00	7.03	0.65	10.5	0.28	19.4	38.8	Clear	None
15:10	5	200	5.46	0.00	7	0.64	2.23	0.18	19.4	38.5	Clear	None
15:15	5	200	5.46	0.00	7.03	0.65	0.02	0.15	19.7	33.6	Clear	None
15:20	5	200	5.46	0.00	7.04	0.65	0.02	0.16	19.6	33.3	Clear	None
15:25	5	200	5.46	0.00	7.04	0.65	0.02	0.14	19.7	32.9	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
VOCs	40 mL Glass	3	HCL
Metals	250mL HDPE Plastic	1	HNO3
hexavalent chromium	250 mL Plastic	1	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-88			**Date**	08/27/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	84.0 degrees F and Clear. The wind is blowing W at 62.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.58	**Total Depth (ft-bmp)**	15.02	**Water Column(ft)**	8.44	**Gallons in Well**	1.37
MP Elevation		**Pump Intake (ft-bmp)**	12.52	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:50	**Volumes Purged**		**Sample ID**	MW-18-88_082720	**Sampled by**	Austin Westhuis
Purge Start	12:25	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:55						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:30	0	0	100	6.74	0.13	7.08	0.62	12.6	0.18	21.7	-28.2	--	--
12:35	5	5	100	6.74	0.26	7.08	0.63	8.04	0.16	21.7	-21.1	--	--
12:40	5	10	100	6.74	0.40	7.07	0.62	3.01	0.16	21.8	-214.6	--	--
12:45	5	15	100	6.74	0.53	7.07	0.62	2.46	0.15	21.8	-216.7	--	--
12:50	5	20	100	6.74	0.66	7.07	0.62	2.3	0.15	21.7	-218	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-88			**Date**	12/07/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.20	**Total Depth (ft-bmp)**	15	**Water Column(ft)**	9.8	**Gallons in Well**	1.59
MP Elevation		**Pump Intake (ft-bmp)**	12.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:00	**Volumes Purged**	0.58	**Sample ID**	MW-18-88_120720	**Sampled by**	Austin Westhuis
Purge Start	13:30	**Gallons Purged**	0.92	**Replicate/ Code No.**			
Purge End	14:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:35	0	0	100	5.20	0.13	6.75	0.472	16.9	0.35	11.5	90.3	--	--
13:40	5	5	100	5.20	0.26	6.96	0.478	4.8	0.16	11.6	74.5	--	--
13:45	5	10	100	5.20	0.40	6.98	0.472	3.04	0.15	11.6	72.4	--	--
13:50	5	15	100	5.20	0.53	6.97	0.47	2.21	0.11	11.4	72.6	--	--
13:55	5	20	100	5.20	0.66	6.97	0.467	2.07	0.11	11.4	74.6	--	--
14:00	5	25	100	5.20	0.79	6.95	0.472	1.64	0.1	11.4	75	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-18-89			**Date**	3/3/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	7.76	**Total Depth (ft-bmp)**	15.6	**Water Column(ft)**	7.84	**Gallons in Well**	1.27
MP Elevation	NA	**Pump Intake (ft-bmp)**	13.6	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	12:30	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	12:05						
Purge End:	12:35						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:10	0	200	8.68	0.26	7.98	0.423	10.1	0.13	7	182.4	Clear	None
12:15	5	200	9.1	0.53	8.01	0.422	3.94	0.15	6.9	181.7	Clear	None
12:20	5	200	10.15	0.79	8	0.419	2.08	0.16	6.7	182.1	Clear	None
12:25	5	200	10.67	1.06	8.03	0.42	1.88	0.15	6.6	179.4	Clear	None
12:30	5	200	10.94	1.32	8.03	0.42	1.48	0.15	6.5	177.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-89			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	6.99	**Total Depth (ft-bmp)**	15.6	**Water Column(ft)**	9	**Gallons in Well**	1.4
MP Elevation		**Pump Intake (ft-bmp)**	14	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:50	**Volumes Purged**		**Sample ID**	MW-18-89_060820	**Sampled by**	Jacob Pisarkiewicz
Purge Start	14:10	**Gallons Purged**					
Purge End	14:45			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:20		200	8.25	0.00	7.78	0.67	0.02	0.36	17.6	63.6	Clear	None
14:25	5	200	10.1	0.00	7.79	0.59	0.02	0.24	18.2	40.5	Clear	None
14:30	5	200	11.1	0.00	7.82	0.6	1.21	0.32	18.1	37.9	Clear	None
14:35	5	200	11.3	0.00	7.83	0.59	3.23	0.63	18.5	44.3	Clear	None
14:40	5	200	11.3	0.00	7.86	0.6	1.23	0.67	18.1	41.4	Clear	None
14:45	5	200	11.3	0.00	7.86	0.6	0.22	0.66	18.1	41.2	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Na

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-89			**Date**	08/27/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	81.0 degrees F and Clear. The wind is blowing W at 58.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.31	**Total Depth (ft-bmp)**	15.62	**Water Column(ft)**	6.31	**Gallons in Well**	1.03
MP Elevation		**Pump Intake (ft-bmp)**	13.12	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:05	**Volumes Purged**		**Sample ID**	MW-18-89_082720	**Sampled by**	Austin Westhuis
Purge Start	10:40	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:07						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:45	0	0	100	10.80	0.13	8.05	0.79	1.77	0.15	21.9	-128.7	--	--
10:50	5	5	100	11.59	0.26	7.98	0.78	1.7	0.05	22.1	-146.3	--	--
10:55	5	10	100	12.20	0.40	7.97	0.74	1.33	0.13	22.2	-153.5	--	--
11:00	5	15	100	12.98	0.53	7.94	0.71	1.22	0.01	22	-153.5	--	--
11:05	5	20	100	13.12	0.53	7.98	0.71	1.49	0.06	22	-154.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments: Well purged dry shortly after 1105. Wait for recharge.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-89			**Date**	12/08/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	35 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	8.72	**Total Depth (ft-bmp)**	15.6	**Water Column(ft)**	6.88	**Gallons in Well**	1.12
MP Elevation		**Pump Intake (ft-bmp)**	13.1	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:00	**Volumes Purged**	0.71	**Sample ID**	MW-18-89_120820	**Sampled by**	Austin Westhuis
Purge Start	10:35	**Gallons Purged**	0.79	**Replicate/ Code No.**			
Purge End	11:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:40	0	0	100	10.05	0.13	7.56	0.61	6.48	0.54	11.8	162.5	--	--
10:45	5	5	100	10.88	0.26	7.78	0.61	3.09	0.61	11.8	150.2	--	--
10:50	5	10	100	10.88	0.40	7.8	0.61	2.09	0.61	11.8	148.5	--	--
10:55	5	15	100	11.73	0.53	7.81	0.62	1.73	0.59	11.9	145.4	--	--
11:00	5	20	100	12.54	0.53	7.8	0.62	1.51	0.57	11.9	144.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-18-90			**Date**	3/3/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	9.38	**Total Depth (ft-bmp)**	23.15	**Water Column(ft)**	13.77	**Gallons in Well**	2.24
MP Elevation	NA	**Pump Intake (ft-bmp)**	21.15	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	13:30	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	13:00						
Purge End:	13:35						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:05	0	200	9.78	0.26	12.46	1.69	7.63	1.14	10.6	131.3	Clear	None
13:10	5	200	9.78	0.53	12.47	1.74	3.83	0.83	10.6	129	Clear	None
13:15	5	200	9.78	0.79	12.46	1.75	1.91	0.68	10.8	127	Clear	None
13:20	5	200	9.78	1.06	12.48	1.77	1.66	0.6	10.7	124.6	Clear	None
13:25	5	200	9.78	1.32	12.48	1.81	1.5	0.44	10.7	122	Clear	None
13:30	5	200	9.78	1.59	12.48	1.81	1.22	0.41	10.7	121.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Well Locked at Arrival: yes

Condition of Well: Good

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-90			**Date**	6/5/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Steel
Static Water Level (ft-bmp)	9.52	**Total Depth (ft-bmp)**	23.2	**Water Column(ft)**	14	**Gallons in Well**	2.22
MP Elevation		**Pump Intake (ft-bmp)**	20	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:10	**Volumes Purged**		**Sample ID**	MW-18-90	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:05		250	9.6	0.00	12.07	1.9	6.23	0.96	15.5	-8.5	Clear	None
14:10	5	250	9.6	0.00	12.12	1.95	8.08	0.29	14.7	-46.9	Clear	None
14:15	5	250	9.6	0.00	12.11	2.02	32	0.16	14.8	-82.6	Clear	None
14:20	5	250	9.6	0.00	12.12	1.96	35.6	0.16	14.6	-90.3	Clear	None
14:25	5	250	9.6	0.00	12.15	2.1	10.2	0.12	14.5	-118.1	Clear	None
14:30	5	250	9.6	0.00	12.15	2.11	45.2	0.12	14.7	-120.7	Clear	None
14:35	5	250	9.6	0.00	12.21	2.18	35.4	0.11	14.8	-141.7	Clear	None
14:40	5	250	9.6	0.00	12.22	2.19	49.2	0.11	14.8	-147.2	Clear	None
14:45	5	250	9.6	0.00	12.24	2.24	8.25	0.1	14.8	-162.3	Clear	None
14:50	5	250	9.6	0.00	12.25	2.25	8	0.11	14.6	-163.5	Clear	None
14:55	5	250	9.6	0.00	12.27	2.26	5.24	0.1	14.9	-178.9	Clear	None
15:00	5	250	9.6	0.00	12.28	2.24	5.23	0.11	14.8	-181.6	Clear	None
15:05	5	250	9.6	0.00	12.3	2.3	4.18	0.1	14.3	-185.2	Clear	None
15:10	5	250	9.6	0.00	12.3	2.3	4.14	0.16	14	-192.3	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-90			**Date**	08/27/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	84.0 degrees F and Clear. The wind is blowing W at 62.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.91	**Total Depth (ft-bmp)**	23.17	**Water Column(ft)**	12.26	**Gallons in Well**	1.99
MP Elevation		**Pump Intake (ft-bmp)**	20.67	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:50	**Volumes Purged**		**Sample ID**	MW-18-90_082720	**Sampled by**	Austin Westhuis
Purge Start	11:25	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	11:55						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:30	0	0	100	11.01	0.13	11.83	1.8	4.93	0.28	18.8	-247.7	--	--
11:35	5	5	100	11.01	0.26	12.1	1.82	2.81	0.25	18.9	-263.2	--	--
11:40	5	10	100	11.01	0.40	12.3	1.92	2.08	0.24	18.7	-270.2	--	--
11:45	5	15	100	11.01	0.53	12.29	1.96	1.63	0.22	18.5	-277.1	--	--
11:50	5	20	100	11.01	6.61	12.28	1.96	1.55	0.22	18.5	-280.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-90			**Date**	12/07/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	10.27	**Total Depth (ft-bmp)**	23.15	**Water Column(ft)**	12.88	**Gallons in Well**	2.09
MP Elevation		**Pump Intake (ft-bmp)**	20.65	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:50	**Volumes Purged**	0.38	**Sample ID**	MW-18-90_120720	**Sampled by**	Austin Westhuis
Purge Start	14:25	**Gallons Purged**	0.79	**Replicate/ Code No.**			
Purge End	14:55						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:30	0	0	100	10.27	0.13	11.53	1.38	16.1	0.44	12.6	-77.3	--	--
14:35	5	5	100	10.27	0.26	12.13	1.66	1.79	0.64	12.9	-173.2	--	--
14:40	5	10	100	10.27	0.40	12.1	1.71	1.56	0.48	13.4	-180.6	--	--
14:45	5	15	100	10.27	0.53	12.12	1.73	1.47	0.44	13.2	-186.7	--	--
14:50	5	20	100	10.27	0.66	12.12	1.74	1.21	0.44	13.2	-187.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-18-91			**Date**	3/2/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	5.94	**Total Depth (ft-bmp)**	14.98	**Water Column(ft)**	9.04	**Gallons in Well**	1.47
MP Elevation	NA	**Pump Intake (ft-bmp)**	12.98	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	16:05	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	15:40						
Purge End:	16:10						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:45	0	200	6.65	0.26	7.58	0.487	12.4	0.4	8	115.1	Clear	None
15:50	5	200	7.2	0.53	7.54	0.483	3.81	0.18	7.7	117.7	Clear	None
15:55	5	200	8.01	0.79	7.67	0.482	2.26	0.08	7.5	109.2	Clear	None
16:00	5	200	8.21	1.06	7.69	0.481	1.8	0.08	7.5	107.3	Clear	None
16:05	5	200	8.33	1.32	7.75	0.483	1.76	0.07	7.6	104.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-91			**Date**	6/5/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Steel
Static Water Level (ft-bmp)	5.78	**Total Depth (ft-bmp)**	15	**Water Column(ft)**	9	**Gallons in Well**	1.5
MP Elevation		**Pump Intake (ft-bmp)**	13	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:05	**Volumes Purged**		**Sample ID**	MW-18-91	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:20		250	5.78	0.00	7.77	0.76	21.1	0.33	16.2	-173.4	Clear	None
11:25	5	250	7.3	0.00	7.74	0.76	28.7	0.22	16.3	-182.8	Clear	None
11:30	5	250	7.75	0.00	7.8	0.75	20.8	0.18	16.4	-192.1	Clear	None
11:35	5	250	8	0.00	7.83	0.74	11.3	0.17	16.4	-195.5	Clear	None
11:40	5	250	8.2	0.00	7.83	0.75	9.84	0.14	16.7	-197.5	Clear	None
11:45	5	250	8.4	0.00	7.83	0.74	9.39	0.17	16.7	-197.1	Clear	None
11:50	5	250	8.6	0.00	7.83	0.74	9	0.18	16.7	-198.6	Clear	None
11:55	5	250	8.8	0.00	7.84	0.74	7.26	0.16	16.4	-197.4	Clear	None
12:00	5	250	9	0.00	7.85	0.74	7.2	0.16	16.5	-196.7	Clear	None
12:05	5	250	9	0.00	7.84	0.74	7.7	0.16	16.4	-196.4	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	125 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-91			**Date**	08/27/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	89.1 degrees F and Clear and Windy. The wind is blowing W at 70.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.78	**Total Depth (ft-bmp)**	14.99	**Water Column(ft)**	7.21	**Gallons in Well**	1.17
MP Elevation		**Pump Intake (ft-bmp)**	12.49	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:55	**Volumes Purged**		**Sample ID**	MW-18-91_082720	**Sampled by**	Austin Westhuis
Purge Start	13:35	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	14:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:40	0	0	100	9.07	0.13	7.63	0.82	2.09	0.17	21.2	-176.4	--	--
13:45	5	5	100	9.62	0.26	7.66	0.79	1.64	0.15	21.2	-175.2	--	--
13:50	5	10	100	9.89	0.40	7.65	0.77	1.6	0.15	21.3	-178	--	--
13:55	5	15	100	10.01	0.53	7.65	0.77	1.34	0.15	21.3	-178.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-91			**Date**	12/07/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.07	**Total Depth (ft-bmp)**	14.98	**Water Column(ft)**	7.91	**Gallons in Well**	1.29
MP Elevation		**Pump Intake (ft-bmp)**	12.48	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:05	**Volumes Purged**	0.61	**Sample ID**	MW-18-91_120720	**Sampled by**	Austin Westhuis
Purge Start	12:40	**Gallons Purged**	0.79	**Replicate/ Code No.**			
Purge End	13:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:45	0	0	100	8.12	0.13	7.61	0.52	7.83	0.32	12.1	104.3	--	--
12:50	5	5	100	8.98	0.26	7.57	0.53	4.09	0.18	11.6	88	--	--
12:55	5	10	100	9.40	0.40	7.57	0.53	2.14	0.16	11.8	74.7	--	--
13:00	5	15	100	9.68	0.53	7.56	0.52	1.91	0.15	11.6	72.2	--	--
13:05	5	20	100	9.90	0.66	7.55	0.52	1.63	0.15	11.6	69.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-92			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 84F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.74	**Total Depth (ft-bmp)**	30.09	**Water Column(ft)**	17	**Gallons in Well**	2.82
MP Elevation		**Pump Intake (ft-bmp)**	27.59	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:55	**Volumes Purged**		**Sample ID**	MW-18-92_060320	**Sampled by**	Austin Westhuis
Purge Start	12:25	**Gallons Purged**					
Purge End	14:00			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:30		200	12.74	0.26	6.84	1.08	24.2	0.34	12.6	15.7	Clear	None
13:35	5	200	12.74	0.53	6.86	1.08	12.6	0.37	12.5	0.4	Clear	None
13:40	5	200	12.74	0.79	6.86	1.08	4.93	0.38	12.6	-11.3	Clear	None
13:45	5	200	12.74	1.06	6.86	1.07	2.74	0.35	12.4	-20.1	Clear	None
13:50	5	200	12.74	1.32	6.86	1.07	2.12	0.34	12.3	-22.1	Clear	None
13:55	5	200	12.74	1.59	6.85	1.07	1.8	0.35	12.3	-23.6	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-92			**Date**	12/01/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.39	**Total Depth (ft-bmp)**	30.1	**Water Column(ft)**	11.71	**Gallons in Well**	1.9
MP Elevation		**Pump Intake (ft-bmp)**	27.6	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:25	**Volumes Purged**	0.49	**Sample ID**	MW-18-92_120120	**Sampled by**	Austin Westhuis
Purge Start	11:55	**Gallons Purged**	0.92	**Replicate/ Code No.**			
Purge End	12:30						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:00	0	0	100	18.39	0.13	6.92	1.02	34.8	0.69	10.8	24.1	--	--
12:05	5	5	100	19.80	0.26	6.99	1.01	13.1	4.68	11.5	-8	--	--
12:10	5	10	100	20.07	0.40	6.98	1	3.97	5.72	11.5	-4.6	--	--
12:15	5	15	100	20.10	0.53	6.97	0.99	2.71	5.75	11.4	-1.4	--	--
12:20	5	20	100	20.12	0.66	6.96	1	2.48	5.45	11.6	0	--	--
12:25	5	25	100	20.14	0.79	6.95	1	2.18	5.48	11.6	0.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-93			**Date**	6/5/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	49.94	**Total Depth (ft-bmp)**	84.9	**Water Column(ft)**	35	**Gallons in Well**	5.68
MP Elevation		**Pump Intake (ft-bmp)**	82.4	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:45	**Volumes Purged**		**Sample ID**	MW-18-93_060520	**Sampled by**	Austin Westhuis
Purge Start	12:10	**Gallons Purged**					
Purge End	12:50			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:15		200	49.94	0.26	7.31	0.492	42.8	1.75	13.8	-115.1	Clear	None
12:20	5	200	49.94	0.53	7.28	0.491	23.6	1.89	13.7	-114.3	Clear	None
12:25	5	200	49.94	0.79	7.27	0.493	14.2	1.97	13.9	-113.1	Clear	None
12:30	5	200	49.94	1.06	7.27	0.49	8.94	2.1	13.9	-112.9	Clear	None
12:35	5	200	49.94	1.32	7.26	0.495	4.32	2.08	14.1	-112.1	Clear	None
12:40	5	200	49.94	1.59	7.26	0.496	3.7	2.04	14.1	-112.2	Clear	None
12:45	5	200	49.94	1.85	7.26	0.495	3.34	2.03	14	-112.2	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-93			**Date**	12/07/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	48.92	**Total Depth (ft-bmp)**	86	**Water Column(ft)**	37.08	**Gallons in Well**	6.03
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:35	**Volumes Purged**	0.25	**Sample ID**	MW-18-93	**Sampled by**	Donald Richmond
Purge Start	00:00	**Gallons Purged**	1.50	**Replicate/ Code No.**			
Purge End	12:45						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:05	0	0	100	48.92	--	7.5	0.446	7.79	10.08	9.6	-85.9	--	--
12:10	5	5	100	48.92	--	7.49	0.447	6.59	10.25	9.8	-107.9	--	--
12:15	5	10	100	48.92	--	7.51	0.454	7.73	9.42	10.8	-140	--	--
12:20	5	15	100	48.92	--	7.52	0.45	8.74	9.25	10.3	-146.7	--	--
12:25	5	20	100	48.92	--	7.51	0.45	7.53	8.64	10.4	-160.5	--	--
12:30	5	25	100	48.92	--	7.51	0.447	7.81	8.79	10.1	-163.8	--	--
12:32	2	27	100	48.92	--	7.51	0.449	5.87	8.51	10.1	-165.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-94			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	54.59	**Total Depth (ft-bmp)**	79.62	**Water Column(ft)**	25	**Gallons in Well**	4.07
MP Elevation		**Pump Intake (ft-bmp)**	77.12	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:40	**Volumes Purged**		**Sample ID**	MW-18-94_060820	**Sampled by**	Austin Westhuis
Purge Start	13:00	**Gallons Purged**					
Purge End	13:45			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:05		200	54.59	0.26	6.97	3.76	199	0.02	14.6	-87.5	Clear	None
13:10	5	200	54.59	0.53	6.99	3.74	95.3	0.01	14.7	-87.9	Clear	None
13:15	5	200	54.59	0.79	6.98	3.76	31.6	0.01	14.5	-82.3	Clear	None
13:20	5	200	54.59	1.06	6.97	3.69	14.8	0.01	14.4	-86.1	Clear	None
13:25	5	200	54.59	1.32	6.96	3.77	6.84	0.01	14.3	-87.3	Clear	None
13:30	5	200	54.59	1.59	6.97	3.66	2.94	0.01	14.2	-87.4	Clear	None
13:35	5	200	54.59	1.85	6.97	3.66	2.8	0.01	14.2	-87.7	Clear	None
13:40	5	200	54.59	2.11	6.97	3.66	1.97	0.01	14.1	-87.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
1,4-Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-94			**Date**	12/07/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	53.64	**Total Depth (ft-bmp)**	80.45	**Water Column(ft)**	26.81	**Gallons in Well**	4.36
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:20	**Volumes Purged**	0.34	**Sample ID**	MW-18-94	**Sampled by**	Donald Richmond
Purge Start	01:20	**Gallons Purged**	1.50	**Replicate/ Code No.**			
Purge End	14:20						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:25	0	0	100	53.64	--	7.04	3.91	71.8	0.82	10.8	-126.5	--	--
13:30	5	5	100	53.64	--	7.03	3.98	72.2	0.24	10.6	-132.8	--	--
13:35	5	10	100	53.64	--	7.03	4.03	53.6	0.23	10.8	-134.4	--	--
13:40	5	15	100	53.64	--	7.03	4.05	38	0.11	11	-135.3	--	--
13:45	5	20	100	53.64	--	7.03	4.03	29.4	0.07	10.5	-136.1	--	--
13:50	5	25	100	53.64	--	7.03	3.98	20.7	0.07	10.8	-135.7	--	--
13:55	5	30	100	53.64	--	7.03	3.97	16.6	0.05	10.6	-135.9	--	--
14:00	5	35	100	53.64	--	7.04	3.96	12.2	0.03	10.5	-135.8	--	--
14:05	5	40	100	53.64	--	7.03	3.98	12	0.01	10.6	-136.1	--	--
14:10	5	45	100	53.64	--	7.03	4	9.62	0.01	10.9	-136.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-18-95			**Date**	3/2/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	6.76	**Total Depth (ft-bmp)**	12.45	**Water Column(ft)**	5.69	**Gallons in Well**	0.92
MP Elevation	NA	**Pump Intake (ft-bmp)**	10.45	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	17:55	**Gallons Purged**		**Replicate/ Code No.**	Dup-03	**Evacuation Method**	Peristaltic
Purge Start:	17:30						
Purge End:	18:00						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
17:35	0	200	6.77	0.26	7.64	0.302	4.72	5.84	6.2	13	Clear	None
17:40	5	200	6.77	0.53	7.79	0.301	2.19	6.83	6.1	129.6	Clear	None
17:45	5	200	6.77	0.79	7.82	0.304	1.77	6.77	6	129.8	Clear	None
17:50	5	200	6.77	0.79	7.82	0.306	1.6	6.72	6	130.1	Clear	None
17:55	5	200	6.77	0.79	7.82	0.309	1.44	6.7	6	132	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-95			**Date**	6/5/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC,Steel
Static Water Level (ft-bmp)	6.83	**Total Depth (ft-bmp)**	12.42	**Water Column(ft)**	6	**Gallons in Well**	0.91
MP Elevation		**Pump Intake (ft-bmp)**	11	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:40	**Volumes Purged**		**Sample ID**	MW-18-95	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**					
Purge End	#Error			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:50		250	6.83	0.00	7.72	0.55	52.2	1.25	15.6	73	Clear	None
12:55	5	250	6.83	0.00	7.73	0.54	42.3	0.89	15.5	61	Clear	None
13:00	5	250	6.83	0.00	7.74	0.53	23.7	1.08	15.5	38	Clear	None
13:05	5	250	6.83	0.00	7.75	0.52	9.54	1.42	15.3	24.8	Clear	None
13:10	5	250	6.83	0.00	7.74	0.52	8.56	1.35	15.2	21.8	Clear	None
13:15	5	250	6.83	0.00	7.71	0.53	2.99	1.17	15.1	15	Clear	None
13:20	5	250	6.83	0.00	7.65	0.54	4	1.1	15.5	6.8	Clear	None
13:25	5	250	6.83	0.00	7.64	0.54	4	1.08	15.5	6	Clear	None
13:30	5	250	6.83	0.00	7.61	0.54	1.54	1.06	15.8	2.3	Clear	None
13:35	5	250	6.83	0.00	7.59	0.54	1.5	1.03	15.6	0.9	Clear	None
13:40	5	250	6.83	0.00	7.59	0.54	1.53	1.03	15.5	-0.2	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-95			**Date**	08/28/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**	71.1 degrees F and Light Rain. The wind is blowing S at 20.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.26	**Total Depth (ft-bmp)**	12.45	**Water Column(ft)**	5.19	**Gallons in Well**	0.84
MP Elevation		**Pump Intake (ft-bmp)**	10.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:45	**Volumes Purged**	1.57	**Sample ID**	MW-18-95_082820	**Sampled by**	Billy Cobern
Purge Start	12:55	**Gallons Purged**	1.32	**Replicate/ Code No.**	DUP-01_082820		
Purge End	13:55						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:55	0	0	100	7.26	0.00							--	--
13:00	5	5	100	7.59	0.13	7.33	0.62	17.8	0.83	21.6	200.9	--	--
13:05	5	10	100	7.88	0.26	7.32	0.61	10.8	0.89	21.7	157.3	--	--
13:10	5	15	100	8.07	0.40	7.32	0.61	8.79	0.85	21.9	137.6	--	--
13:15	5	20	100	8.19	0.53	7.31	0.6	7.78	0.64	22	121.4	--	--
13:20	5	25	100	8.29	0.66	7.31	0.6	7.52	0.52	21.9	115.7	--	--
13:25	5	30	100	8.29	0.79	7.31	0.6	7.23	0.49	21.8	108.4	--	--
13:30	5	35	100	8.29	0.92	7.3	0.6	7.23	0.46	21.9	102.7	--	--
13:35	5	40	100	8.39	1.06	7.3	0.59	7.51	0.43	21.8	100.7	--	--
13:40	5	45	100	8.48	1.19	7.29	0.6	7.25	0.41	21.9	99.7	--	--
13:45	5	50	100	8.57	1.32	7.29	0.6	7.48	0.42	21.8	98.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	4	None

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-95			**Date**	12/07/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.11	**Total Depth (ft-bmp)**	12.45	**Water Column(ft)**	5.34	**Gallons in Well**	0.87
MP Elevation		**Pump Intake (ft-bmp)**	9.95	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:00	**Volumes Purged**	1.21	**Sample ID**	MW-18-95_120720	**Sampled by**	Austin Westhuis
Purge Start	11:30	**Gallons Purged**	1.06	**Replicate/ Code No.**	Dup-06_120720		
Purge End	12:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:35	0	0	100	7.30	0.13	7.16	0.433	4.88	2.32	10.2	134.9	--	--
11:40	5	5	100	7.45	0.26	7.43	0.435	2.02	1.99	10.5	121.6	--	--
11:45	5	10	100	7.50	0.40	7.43	0.434	1.79	1.71	10.7	115.3	--	--
11:50	5	15	100	7.70	0.53	7.39	0.43	1.7	1.43	10.7	104.3	--	--
11:55	5	20	100	7.73	0.66	7.36	0.422	1.37	1.41	10.7	102.6	--	--
12:00	5	25	100	7.73	0.79	7.34	0.425	1.3	1.37	10.7	101	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-96			**Date**	6/2/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.26	**Total Depth (ft-bmp)**	14.81	**Water Column(ft)**	2	**Gallons in Well**	0.25
MP Elevation		**Pump Intake (ft-bmp)**	14.31	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	17:20	**Volumes Purged**		**Sample ID**	MW-18-96_060220	**Sampled by**	Austin Westhuis
Purge Start	16:35	**Gallons Purged**					
Purge End	17:00			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
16:40		200	13.93	0.26	7.41	0.462	6.38	5.59	14.8	49.3	Clear	None
16:45	5	200	14	0.53	7.32	0.51	2.96	5.13	15.5	49.1	Clear	None
16:50	5	200	14.24	0.79	7.3	0.52	2.12	5.02	15.6	50.4	Clear	None
16:55	5	200	14.5	1.06	7.27	0.55	2.01	5.4	16.1	54.1	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments: Well purged dry at 1700. Wait for recharge before sampling.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-97			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	57.97	**Total Depth (ft-bmp)**	91.7	**Water Column(ft)**	34	**Gallons in Well**	5.48
MP Elevation		**Pump Intake (ft-bmp)**	88.2	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:15	**Volumes Purged**		**Sample ID**	MW-18-97_060820	**Sampled by**	Austin Westhuis
Purge Start	10:40	**Gallons Purged**					
Purge End	12:20			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:45		200	57.97	0.26	6.71	1.49	16.5	5.29	15.4	-57.3	Clear	None
11:50	5	200	57.97	0.53	6.79	1.46	8.92	0.89	14.3	-67.1	Clear	None
11:55	5	200	57.97	0.79	6.78	1.48	3.17	0.45	14.3	-69	Clear	None
12:00	5	200	57.97	1.06	6.76	1.51	2.82	0.38	14.3	-69.2	Clear	None
12:05	5	200	57.97	1.32	6.76	1.51	2.02	0.35	14.3	-67.2	Clear	None
12:10	5	200	57.97	1.59	6.76	1.51	1.64	0.33	14.3	-66.2	Clear	None
12:15	5	200	57.97	1.85	6.76	1.51	1.41	0.32	14.2	-65.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None
1,4-Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-97			**Date**	12/07/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	60.51	**Total Depth (ft-bmp)**	92.6	**Water Column(ft)**	32.09	**Gallons in Well**	5.21
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:25	**Volumes Purged**	0.19	**Sample ID**	MW-18-97	**Sampled by**	Donald Richmond
Purge Start	22:50	**Gallons Purged**	1.00	**Replicate/ Code No.**			
Purge End	11:30						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:00	0	0	100	60.51	--	7.18	0.97	12	0.23	10	-78.4	--	--
11:05	5	5	100	60.51	--	7.16	0.97	7.28	0.1	9.2	-104.6	--	--
11:10	5	10	100	60.51	--	7.07	1.04	4.77	0.06	9.9	-117.5	--	--
11:15	5	15	100	60.51	--	7.05	1.08	5.72	0.06	9.8	-122.9	--	--
11:20	5	20	100	60.51	--	7.02	1.12	5.02	0.06	9.3	-128.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: EB-2_120720 Taken

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-18-98			**Date**	3/2/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Sunny, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	4.51	**Total Depth (ft-bmp)**	14.9	**Water Column(ft)**	10.39	**Gallons in Well**	1.69
MP Elevation	NA	**Pump Intake (ft-bmp)**	12.9	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	14:45	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	14:15						
Purge End:	14:50						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:20	0	200	6	0.26	7.17	0.44	3.03	0.19	7.2	95.6	Clear	None
14:25	5	200	6.68	0.53	7.36	0.415	2.08	0.19	7.3	73.3	Clear	None
14:30	5	200	7.1	0.79	7.33	0.414	1.69	0.13	7.3	72.9	Clear	None
14:35	5	200	7.32	1.06	7.41	0.418	1.44	0.06	7.4	64.6	Clear	None
14:40	5	200	7.56	1.32	7.41	0.42	1.22	0.05	7.5	60.3	Clear	None
14:45	5	200	7.65	1.32	7.41	0.42	1.17	0.05	7.4	59.1	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-98			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 84F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.63	**Total Depth (ft-bmp)**	14.9	**Water Column(ft)**	9	**Gallons in Well**	1.51
MP Elevation		**Pump Intake (ft-bmp)**	12.4	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:55	**Volumes Purged**		**Sample ID**	MW-18-98_060320	**Sampled by**	Austin Westhuis
Purge Start	09:25	**Gallons Purged**					
Purge End	10:00			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:30		200	5.63	0.26	6.86	0.54	4.12	0.64	14	-73.6	Clear	None
09:35	5	200	7.94	0.53	6.91	0.53	3.61	0.36	13.8	-80.2	Clear	None
09:40	5	200	8.14	0.79	6.94	0.53	2.59	0.33	14.2	-84.6	Clear	None
09:45	5	200	8.39	1.06	6.97	0.52	2.4	0.27	14.1	-85.6	Clear	None
09:50	5	200	8.49	1.32	7	0.53	2.25	0.29	14	-78.8	Clear	None
09:55	5	200	8.49	1.59	6.99	0.53	2.02	0.29	13.9	-76.1	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-98			**Date**	08/27/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	75.0 degrees F and Clear. The wind is blowing SW at 45.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.60	**Total Depth (ft-bmp)**	14.92	**Water Column(ft)**	7.32	**Gallons in Well**	1.19
MP Elevation		**Pump Intake (ft-bmp)**	12.42	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:05	**Volumes Purged**		**Sample ID**	MW-18-98_082720	**Sampled by**	Austin Westhuis
Purge Start	08:40	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	09:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:45	0	0	100	8.52	0.13	7.29	0.71	12.3	0.24	20.8	-144.8	--	--
08:50	5	5	100	8.68	0.26	7.28	0.71	4.31	0.16	20.8	-146.2	--	--
08:55	5	10	100	8.68	0.40	7.25	0.7	2.42	0.12	20.8	-147.1	--	--
09:00	5	15	100	8.73	0.53	7.23	0.7	2.2	0.12	20.8	-147.5	--	--
09:05	5	20	100	8.76	0.66	7.22	0.7	2.08	0.11	20.8	-147.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-98			**Date**	12/01/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.99	**Total Depth (ft-bmp)**	14.9	**Water Column(ft)**	9.91	**Gallons in Well**	1.61
MP Elevation		**Pump Intake (ft-bmp)**	12.4	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:50	**Volumes Purged**	0.57	**Sample ID**	MW-18-98_120120	**Sampled by**	Austin Westhuis
Purge Start	14:20	**Gallons Purged**	0.92	**Replicate/ Code No.**			
Purge End	14:55						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:25	0	0	100	5.21	0.13	7.38	0.57	4.47	0.18	11.1	34.2	--	--
14:30	5	5	100	5.34	0.26	7.38	0.55	1.71	0.21	9.9	32.1	--	--
14:35	5	10	100	5.39	0.40	7.24	0.56	1.5	0.22	10.8	25.1	--	--
14:40	5	15	100	5.39	0.53	7.3	0.57	1.31	0.17	11.1	5.6	--	--
14:45	5	20	100	5.39	0.66	7.3	0.57	1.2	0.17	11	4.9	--	--
14:50	5	25	100	5.39	0.79	7.27	0.57	1.15	0.16	11	4.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-18-99	**Date**	3/2/2020
Project Name/Location	RACER Lansing, MI			**Weather(°F)**	Sunny, 40F

Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	6.25	**Total Depth (ft-bmp)**	16.85	**Water Column(ft)**	10.6	**Gallons in Well**	1.72
MP Elevation	NA	**Pump Intake (ft-bmp)**	14.85	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	13:50	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	13:20						
Purge End:	13:55						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:25	0	200	7.22	0.26	8.03	1.34	12.7	0.11	8.5	237.6	Clear	None
13:30	5	200	7.96	0.53	8.15	1.32	3.88	0.02	8.4	228.5	Clear	None
13:35	5	200	8.74	0.79	8.2	1.31	2.29	0.01	8.3	216.7	Clear	None
13:40	5	200	9.14	1.06	8.23	1.31	2.12	0.01	8.4	202.2	Clear	None
13:45	5	200	9.37	1.32	8.23	1.3	1.9	0.01	8.4	198.6	Clear	None
13:50	5	200	9.44	1.59	8.24	1.3	1.79	0.01	8.4	195.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-99			**Date**	6/2/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	4.12	**Total Depth (ft-bmp)**	16.88	**Water Column(ft)**	13	**Gallons in Well**	2.07
MP Elevation		**Pump Intake (ft-bmp)**	14.38	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:00	**Volumes Purged**		**Sample ID**	MW-18-99_060220	**Sampled by**	Austin Westhuis
Purge Start	15:25	**Gallons Purged**					
Purge End	16:05			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
15:30		200	4.12	0.26	7.83	1.72	21.6	2.79	14.7	-114.8	Clear	None
15:35	5	200	5.75	0.53	7.78	1.78	14.3	2.46	16.5	-126	Clear	None
15:40	5	200	6.02	0.79	7.79	1.79	7.51	2.48	16.5	-128.4	Clear	None
15:45	5	200	6.12	1.06	7.79	1.77	3.48	2.45	16.2	-130.5	Clear	None
15:50	5	200	6.15	1.32	7.82	1.74	2.87	2.81	15.9	-129.7	Clear	None
15:55	5	200	6.15	1.59	7.8	1.74	2.92	2.7	15.8	-125.4	Clear	None
16:00	5	200	6.15	1.85	7.8	1.75	2.56	2.67	15.8	-124.1	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-99			**Date**	08/27/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	79.0 degrees F and Clear. The wind is blowing W/SW at 49.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.98	**Total Depth (ft-bmp)**	16.9	**Water Column(ft)**	10.92	**Gallons in Well**	1.77
MP Elevation		**Pump Intake (ft-bmp)**	14.4	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:00	**Volumes Purged**		**Sample ID**	MW-18-99_082720	**Sampled by**	Austin Westhuis
Purge Start	09:35	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	10:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:40	0	0	100	7.09	0.13	7.64	2.43	2.78	0.34	21.4	-154.7	--	--
09:45	5	5	100	7.44	0.26	7.66	2.44	2.07	0.15	21.5	-157.9	--	--
09:50	5	10	100	7.81	0.40	7.66	2.46	1.71	0.13	21.4	-160.1	--	--
09:55	5	15	100	8.09	0.53	7.65	2.48	1.5	0.13	21.4	-161.6	--	--
10:00	5	20	100	8.21	0.66	7.65	2.49	1.32	0.12	21.3	-162	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-99			**Date**	12/02/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Sunny, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.01	**Total Depth (ft-bmp)**	16.85	**Water Column(ft)**	11.84	**Gallons in Well**	1.92
MP Elevation		**Pump Intake (ft-bmp)**	14.35	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:25	**Volumes Purged**	0.48	**Sample ID**	MW-18-99_120220	**Sampled by**	Austin Westhuis
Purge Start	14:55	**Gallons Purged**	0.92	**Replicate/ Code No.**			
Purge End	15:30						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:00	0	0	100	5.79	0.13	7.93	2.12	9.44	0.33	13	-64.5	--	--
15:05	5	5	100	6.52	0.26	7.98	2.08	4.61	0.15	13.1	-54.3	--	--
15:10	5	10	100	6.98	0.40	7.98	2.08	2.09	0.1	13	-51.3	--	--
15:15	5	15	100	7.31	0.53	7.95	2.07	1.64	0.09	12.9	-56.1	--	--
15:20	5	20	100	7.53	0.66	7.93	2.07	1.46	0.09	12.9	-59	--	--
15:25	5	25	100	7.72	0.79	7.93	2.07	1.22	0.09	13.1	-64.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-100			**Date**	6/3/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 84F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.69	**Total Depth (ft-bmp)**	15.85	**Water Column(ft)**	6	**Gallons in Well**	1
MP Elevation		**Pump Intake (ft-bmp)**	13.55	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:00	**Volumes Purged**		**Sample ID**	MW-18-100_060320	**Sampled by**	Austin Westhuis
Purge Start	10:35	**Gallons Purged**					
Purge End	11:05			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:40		200	10.33	0.26	7.55	0.438	3.02	4.71	13.9	30.8	Clear	None
10:45	5	200	10.33	0.53	7.57	0.424	2.61	4.88	13.9	31.3	Clear	None
10:50	5	200	10.33	0.79	7.58	0.396	2.4	5.3	13.9	37.4	Clear	None
10:55	5	200	10.33	1.06	7.59	0.389	2.14	5.31	13.8	37.5	Clear	None
11:00	5	200	10.33	1.32	7.6	0.386	1.78	5.23	13.8	38	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-100			**Date**	12/01/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.02	**Total Depth (ft-bmp)**	15.85	**Water Column(ft)**	4.83	**Gallons in Well**	0.78
MP Elevation		**Pump Intake (ft-bmp)**	13.35	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	16:10	**Volumes Purged**	1.52	**Sample ID**	MW-18-100_120120	**Sampled by**	Austin Westhuis
Purge Start	15:30	**Gallons Purged**	1.19	**Replicate/ Code No.**			
Purge End	16:15						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:35	0	0	100	11.50	0.13	7.89	0.76	241	0.73	13.4	-33.2	--	--
15:40	5	5	100	11.95	0.26	7.85	0.77	200	1.03	13.4	-30.8	--	--
15:45	5	10	100	12.03	0.40	7.83	0.77	141	1.16	13.3	-26.1	--	--
15:50	5	15	100	12.07	0.53	7.8	0.76	101	1.29	13.2	-17.2	--	--
15:55	5	20	100	12.12	0.66	7.76	0.74	83.1	1.31	13.2	-15.6	--	--
16:00	5	25	100	12.15	0.79	7.73	0.73	35.6	1.33	13.3	-13.2	--	--
16:05	5	30	100	12.17	0.92	7.71	0.72	31.9	1.39	13.2	-11.1	--	--
16:10	5	35	100	12.20	1.06	7.69	0.72	22.9	1.41	13.1	-10.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-101			**Date**	6/5/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	59.71	**Total Depth (ft-bmp)**	87.45	**Water Column(ft)**	28	**Gallons in Well**	4.51
MP Elevation		**Pump Intake (ft-bmp)**	84.95	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:10	**Volumes Purged**		**Sample ID**	MW-18-101_060520	**Sampled by**	Austin Westhuis
Purge Start	13:30	**Gallons Purged**					
Purge End	14:15			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:35		200	59.71	0.26	6.88	1.71	15.6	2.91	14.1	-127.9	Clear	None
13:40	5	200	59.71	0.53	6.89	1.85	10.3	2.22	13.9	-129.3	Clear	None
13:45	5	200	59.71	0.79	6.87	1.85	7.8	1.8	13.5	-123.9	Clear	None
13:50	5	200	59.71	1.06	6.87	1.84	3.31	1.63	13.5	-124.3	Clear	None
13:55	5	200	59.71	1.32	6.86	1.65	2.61	1.63	13.5	-126.4	Clear	None
14:00	5	200	59.71	1.59	6.85	1.56	2.2	1.47	13.5	-123.6	Clear	None
14:05	5	200	59.71	1.85	6.85	1.52	1.8	1.43	13.3	-121.4	Clear	None
14:10	5	200	59.71	1.85	6.85	1.52	1.56	1.37	13.3	-120.7	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-101			**Date**	12/07/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	60.30	**Total Depth (ft-bmp)**	87.6	**Water Column(ft)**	27.3	**Gallons in Well**	4.44
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:50	**Volumes Purged**	0.34	**Sample ID**	MW-18-101	**Sampled by**	Donald Richmond
Purge Start	20:50	**Gallons Purged**	1.50	**Replicate/ Code No.**			
Purge End	09:55						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:05	0	0	100	60.30	--	6.87	1.77	167	1.56	4.8	-141.9	--	--
09:10	5	5	100	60.30	--	6.9	1.72	132	0.5	5	-173.5	--	--
09:15	5	10	100	60.30	--	6.91	1.82	67.9	0.55	4.8	-178.6	--	--
09:20	5	15	100	60.30	--	6.93	1.84	71.2	0.46	3.4	-179.5	--	--
09:25	5	20	100	60.30	--	6.95	1.81	51.1	0.51	2.6	-179.8	--	--
09:30	5	25	100	60.30	--	6.96	1.82	45.7	0.3	1.9	-177	--	--
09:35	5	30	100	60.30	--	6.97	1.82	57.7	0.29	1.6	-176.8	--	--
09:40	5	35	100	60.30	--	6.98	1.8	52.4	0.32	0.8	-174	--	--
09:45	5	40	100	60.30	--	6.98	1.78	53.7	0.33	0.9	-172.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-102			**Date**	6/2/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.31	**Total Depth (ft-bmp)**	14.69	**Water Column(ft)**	7	**Gallons in Well**	1.2
MP Elevation		**Pump Intake (ft-bmp)**	12.19	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:25	**Volumes Purged**		**Sample ID**	MW-18-102_060220	**Sampled by**	Austin Westhuis
Purge Start	10:35	**Gallons Purged**					
Purge End	11:30			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:40		200	7.31	0.26	6.85	0.5	31.1	4.95	11.2	178.5	Clear	None
10:45	5	200	7.31	0.53	6.91	0.489	14.2	4.38	11.1	144.9	Clear	None
10:50	5	200	7.31	0.79	6.91	0.489	8.51	3.89	11.2	142.1	Clear	None
10:55	5	200	7.31	1.06	6.92	0.492	4.33	3.44	11.6	102.5	Clear	None
11:00	5	200	7.31	1.32	6.97	0.49	2.38	3.27	11.3	95.1	Clear	None
11:05	5	200	7.31	1.59	6.93	0.49	2.03	3.32	11.3	88.4	Clear	None
11:10	5	200	7.31	1.85	6.96	0.491	1.8	2.88	11.4	73.1	Clear	None
11:15	5	200	7.31	2.11	6.96	0.491	1.71	2.58	11.3	72.1	Clear	None
11:20	5	200	7.31	2.38	6.96	0.492	1.63	2.54	11.3	70.1	Clear	None
11:25	5	200	7.31	2.64	6.94	0.49	1.41	2.5	11.3	69.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3 - off site park.	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-102			**Date**	12/02/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Sunny, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.45	**Total Depth (ft-bmp)**	14.65	**Water Column(ft)**	2.2	**Gallons in Well**	0.36
MP Elevation		**Pump Intake (ft-bmp)**	14.15	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:05	**Volumes Purged**	3.30	**Sample ID**	MW-18-102_120220	**Sampled by**	Austin Westhuis
Purge Start	12:25	**Gallons Purged**	1.19	**Replicate/ Code No.**			
Purge End	13:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:30	0	0	100	12.68	0.13	7.32	0.51	53.4	1.01	12	80.9	--	--
12:35	5	5	100	12.68	0.26	7.32	0.51	23.9	0.74	12	45.3	--	--
12:40	5	10	100	12.68	0.40	7.32	0.51	11.6	0.69	11.9	41.4	--	--
12:45	5	15	100	12.68	0.53	7.32	0.51	4.41	0.43	12	22.6	--	--
12:50	5	20	100	12.68	0.66	7.32	0.51	3.27	0.33	12	27.4	--	--
12:55	5	25	100	12.68	0.79	7.32	0.51	2.41	0.23	12.2	6.8	--	--
13:00	5	30	100	12.68	0.92	7.32	0.51	2.02	0.21	12.2	5.9	--	--
13:05	5	35	100	12.68	1.06	7.32	0.51	1.94	0.21	12.2	5.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-18-103			**Date**	3/3/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	0.72	**Total Depth (ft-bmp)**	10.7	**Water Column(ft)**	9.98	**Gallons in Well**	1.62
MP Elevation	NA	**Pump Intake (ft-bmp)**	8.7	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	10:55	**Gallons Purged**		**Replicate/ Code No.**	MS/MSD	**Evacuation Method**	Peristaltic
Purge Start:	10:30						
Purge End:	11:00						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:35	0	200	1.44	0.26	7.14	0.422	13.9	1.14	6.4	97.7	Clear	None
10:40	5	200	1.44	0.53	7.14	0.424	6.43	1.27	6.2	99.1	Clear	None
10:45	5	200	1.44	0.79	7.15	0.431	3.03	1.53	6.1	99.8	Clear	None
10:50	5	200	1.44	1.06	7.15	0.43	2.49	1.47	6.1	99.7	Clear	None
10:55	5	200	1.44	1.32	7.16	0.431	2.06	1.45	6.1	99.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-103			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.07	**Total Depth (ft-bmp)**	10.67	**Water Column(ft)**	9	**Gallons in Well**	1.4
MP Elevation		**Pump Intake (ft-bmp)**	8.17	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:10	**Volumes Purged**		**Sample ID**	MW-18-103_060420	**Sampled by**	Austin Westhuis
Purge Start	11:35	**Gallons Purged**					
Purge End	12:15			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
11:40		200	2.07	0.26	7.11	0.51	30.1	1.81	13	24.7	Clear	None
11:45	5	200	2.07	0.53	7.07	0.488	12.1	1.64	12.2	33.2	Clear	None
11:50	5	200	2.07	0.79	7.04	0.484	4.9	1.68	12.1	38.9	Clear	None
11:55	5	200	2.07	1.06	6.99	0.481	2.91	1.92	12.1	46.8	Clear	None
12:00	5	200	2.07	1.32	6.97	0.479	2.44	1.76	12	50.4	Clear	None
12:05	5	200	2.07	1.59	6.96	0.479	2.19	1.71	12	51.7	Clear	None
12:10	5	200	2.07	1.85	6.96	0.478	1.81	1.68	12	52.5	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3 - off site park
Condition of Well: Good
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-103			**Date**	08/28/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**	70.0 degrees F and Light Rain and Fog/Mist. The wind is blowing SE at 16.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.35	**Total Depth (ft-bmp)**	10.65	**Water Column(ft)**	5.3	**Gallons in Well**	0.86
MP Elevation		**Pump Intake (ft-bmp)**	9	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:44	**Volumes Purged**	1.23	**Sample ID**	MW-18-103_082820	**Sampled by**	Billy Cobern
Purge Start	11:30	**Gallons Purged**	1.06	**Replicate/ Code No.**	MW-18-103_082820		
Purge End	12:25						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:30	0	0	100	5.35	0.00							--	--
11:35	5	5	100	5.51	0.13	7.08	0.7	114	0.95	17.2	122.8	--	--
11:40	5	10	100	5.55	0.26	7.08	0.7	87.6	1.07	16.7	175.8	--	--
11:45	5	15	100	5.73	0.40	7	0.69	56.1	0.54	16.7	172.5	--	--
11:50	5	20	100	5.96	0.53	7.03	0.69	44.5	1	16.7	168.1	--	--
11:55	5	25	100	6.08	0.66	7.05	0.7	41.2	0.44	16.7	163.6	--	--
12:00	5	30	100	6.18	0.79	7.05	0.7	39.8	0.63	16.6	162.4	--	--
12:05	5	35	100	6.27	0.92	7.05	0.69	38.6	0.61	16.6	161.9	--	--
12:10	5	40	100	6.34	1.06	7.05	0.69	37.4	0.63	16.6	161.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	6	None

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant-3

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Completion: Flush mount

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-103			**Date**	12/07/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.74	**Total Depth (ft-bmp)**	10.8	**Water Column(ft)**	8.06	**Gallons in Well**	1.31
MP Elevation		**Pump Intake (ft-bmp)**	8.3	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:35	**Volumes Purged**	0.61	**Sample ID**	MW-18-103_120720	**Sampled by**	Austin Westhuis
Purge Start	09:10	**Gallons Purged**	0.79	**Replicate/ Code No.**			
Purge End	09:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:15	0	0	100	2.74	0.13	6.4	0.58	3.88	0.88	10.2	140.8	--	--
09:20	5	5	100	2.74	0.26	6.49	0.57	2.1	0.76	10	130.5	--	--
09:25	5	10	100	2.74	0.40	6.6	0.57	1.64	0.65	10	113	--	--
09:30	5	15	100	2.74	0.53	6.63	0.57	1.51	0.65	10	109.1	--	--
09:35	5	20	100	2.74	0.66	6.67	0.57	1.22	0.63	10	103.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-18-104			**Date**	3/4/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Sunny, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	1.18	**Total Depth (ft-bmp)**	9.45	**Water Column(ft)**	8.27	**Gallons in Well**	1.34
MP Elevation	NA	**Pump Intake (ft-bmp)**	7.45	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	14:55	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	14:30						
Purge End:	15:00						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:35	0	200	2.26	0.26	7.16	0.415	3.62	1.2	6.6	85.5	Clear	None
14:40	5	200	2.26	0.53	7.22	0.409	2.61	0.72	6.5	74.1	Clear	None
14:45	5	200	2.26	0.79	7.28	0.409	2.07	0.6	6.5	70.1	Clear	None
14:50	5	200	2.26	1.06	7.25	0.408	1.59	0.53	6.4	70.3	Clear	None
14:55	5	200	2.26	1.32	7.29	0.409	1.3	0.42	6.6	67.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-104			**Date**	6/2/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	1.55	**Total Depth (ft-bmp)**	9.46	**Water Column(ft)**	8	**Gallons in Well**	1.29
MP Elevation		**Pump Intake (ft-bmp)**	6.96	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:40	**Volumes Purged**		**Sample ID**	MW-18-104_060220	**Sampled by**	Austin Westhuis
Purge Start	12:05	**Gallons Purged**					
Purge End	12:45			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:10		200	1.55	0.26	7.21	0.481	12.6	0.3	13.1	34.2	Clear	None
12:15	5	200	1.55	0.53	7.18	0.479	6.14	0.32	13.3	-11.7	Clear	None
12:20	5	200	1.55	0.79	7.15	0.48	4.11	0.35	13.4	-12	Clear	None
12:25	5	200	1.55	1.06	7.18	0.483	2.81	0.39	13.5	-11.8	Clear	None
12:30	5	200	1.55	1.32	7.1	0.488	2.09	0.5	13.8	-9.3	Clear	None
12:35	5	200	1.55	1.59	7.08	0.486	1.66	0.49	13.5	-7.9	Clear	None
12:40	5	200	1.55	1.85	7.08	0.486	1.61	0.5	13.5	-7.8	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3 - off site park.
Condition of Well: Good
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-104			**Date**	12/02/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Sunny, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.05	**Total Depth (ft-bmp)**	9.45	**Water Column(ft)**	6.4	**Gallons in Well**	1.04
MP Elevation		**Pump Intake (ft-bmp)**	6.95	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:35	**Volumes Purged**	0.76	**Sample ID**	MW-18-104_120220	**Sampled by**	Austin Westhuis
Purge Start	11:10	**Gallons Purged**	0.79	**Replicate/ Code No.**			
Purge End	11:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:15	0	0	100	3.58	0.13	7.32	0.461	2.02	2.7	11	115.9	--	--
11:20	5	5	100	3.80	0.26	7.38	0.46	1.73	2.71	10.9	109.3	--	--
11:25	5	10	100	3.95	0.40	7.37	0.458	1.55	3.01	10.8	107.2	--	--
11:30	5	15	100	4.03	0.53	7.35	0.457	1.31	3.09	10.8	106.4	--	--
11:35	5	20	100	4.05	0.66	7.35	0.46	1.26	3.12	10.9	105.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	MW-18-105	**Date**	3/3/2020
Project Name/Location	RACER Lansing, MI			**Weather(°F)**	Cloudy, 40F

Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	0	**Total Depth (ft-bmp)**	11.7	**Water Column(ft)**	11.7	**Gallons in Well**	1.9
MP Elevation	NA	**Pump Intake (ft-bmp)**	9.7	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time: 10:15		**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start: 09:40							
Purge End: 10:20							

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:45	0	200	1.18	0.26	6.77	0.446	2.77	0.3	6.3	209.5	Clear	None
09:50	5	200	1.18	0.53	6.85	0.443	2.11	0.22	6.2	166.3	Clear	None
09:55	5	200	1.18	0.79	6.93	0.44	1.8	0.11	6.1	138.3	Clear	None
10:00	5	200	1.18	1.06	7.03	0.438	1.55	0.06	6.1	113.8	Clear	None
10:05	5	200	1.18	1.32	7.07	0.438	1.41	0.06	6.1	105.7	Clear	None
10:10	5	200	1.18	1.59	7.08	0.438	1.22	0.05	6.1	103.1	Clear	None
10:15	5	200	1.18	1.85	7.09	0.437	1.09	0.05	6.1	101.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: yes

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-105			**Date**	6/4/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	0.9	**Total Depth (ft-bmp)**	11.17	**Water Column(ft)**	10	**Gallons in Well**	1.67
MP Elevation		**Pump Intake (ft-bmp)**	8.67	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:00	**Volumes Purged**		**Sample ID**	MW-18-105_060420	**Sampled by**	Austin Westhuis
Purge Start	12:30	**Gallons Purged**					
Purge End	13:10			**Replicate/ Code No.**	Dup-07		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
12:35		200	0.9	0.26	7.11	0.481	1.91	0.27	12	15.3	Clear	None
12:40	5	200	0.9	0.53	7.14	0.468	1.54	0.21	12.1	-4.2	Clear	None
12:45	5	200	0.9	0.79	7.15	0.463	1.33	0.2	12	-31.9	Clear	None
12:50	5	200	0.9	1.06	7.15	0.461	1.3	0.19	12	-40.1	Clear	None
12:55	5	200	0.9	1.32	7.15	0.46	1.17	0.18	12	-41.2	Clear	None
13:00	5	200	0.9	1.59	7.15	0.458	1.09	0.18	12	-43.6	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3 - off site park
Condition of Well: Good
Well Completion: Flush mount
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-105			**Date**	08/28/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**	70.0 degrees F and Light Rain and Fog/Mist. The wind is blowing E at 29.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	3.40	**Total Depth (ft-bmp)**	11.18	**Water Column(ft)**	7.78	**Gallons in Well**	1.26
MP Elevation		**Pump Intake (ft-bmp)**	9	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:25	**Volumes Purged**	0.52	**Sample ID**	MW-18-105_082820	**Sampled by**	Billy Cobern
Purge Start	09:30	**Gallons Purged**	0.66	**Replicate/ Code No.**			
Purge End	10:30						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:30	0	0	100	3.40	0.00							--	--
09:35	5	5	100	3.70	0.13	7.36	0.61	10.2	0.89	17.1	61.6	--	--
09:40	5	10	0	3.70	--							--	--
10:10	30	40	100	3.85	0.26	7.32	0.6	9.12	1.53	17.9	80.3	--	--
10:15	5	45	100	4.05	0.40	7.31	0.6	9.03	0.76	17.6	80.4	--	--
10:20	5	50	100	4.23	0.53	7.3	0.6	8.79	0.71	17.5	80.5	--	--
10:25	5	55	100	4.41	0.66	7.3	0.59	8.53	0.77	17.5	80.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments: Didn't meet drawdown requirements

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-105			**Date**	12/07/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	1.66	**Total Depth (ft-bmp)**	11.2	**Water Column(ft)**	9.54	**Gallons in Well**	1.55
MP Elevation		**Pump Intake (ft-bmp)**	8.7	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:30	**Volumes Purged**	0.60	**Sample ID**	MW-18-105_120720	**Sampled by**	Austin Westhuis
Purge Start	10:05	**Gallons Purged**	0.92	**Replicate/ Code No.**	Not applicable		
Purge End	10:40						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:10	0	0	100	2.29	0.13	6.76	0.492	3.19	1.93	9.3	129.2	--	--
10:15	5	5	100	2.59	0.26	6.79	0.493	1.93	1.76	9.3	127	--	--
10:20	5	10	100	2.99	0.40	6.81	0.497	1.69	1.43	9.4	123	--	--
10:25	5	15	100	3.20	0.53	6.82	0.497	1.44	1.42	9.4	122.4	--	--
10:30	5	20	100	3.31	0.66	6.83	0.498	1.26	1.4	9.4	120.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Flush mount

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: 6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-106			**Date**	6/2/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 85F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	2.79	**Total Depth (ft-bmp)**	9.52	**Water Column(ft)**	7	**Gallons in Well**	1.09
MP Elevation		**Pump Intake (ft-bmp)**	7.02	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	13:45	**Volumes Purged**		**Sample ID**	MW-18-106_060220	**Sampled by**	Austin Westhuis
Purge Start	13:15	**Gallons Purged**					
Purge End	13:50			**Replicate/ Code No.**	Not Applicable		

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:20		200	2.79	0.26	7.01	0.54	14.7	0.71	13.2	-5.7	Clear	None
13:25	5	200	2.79	0.53	7.01	0.54	9.41	0.72	13	-7.5	Clear	None
13:30	5	200	2.79	0.79	7.01	0.54	4.82	0.7	13.3	-4.3	Clear	None
13:35	5	200	2.79	1.06	7	0.52	3.8	0.67	13.2	-0.1	Clear	None
13:40	5	200	2.79	1.32	6.99	0.52	3.1	0.74	13.3	-0.3	Clear	None
13:45	5	200	2.79	1.59	6.99	0.52	2.97	0.72	13.3	-0.3	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3 - off site park.	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	MW-18-106			**Date**	12/02/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	30 °F, Sunny, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	7.57	**Total Depth (ft-bmp)**	9.55	**Water Column(ft)**	1.98	**Gallons in Well**	0.32
MP Elevation		**Pump Intake (ft-bmp)**	9.05	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:45	**Volumes Purged**	2.89	**Sample ID**	MW-18-106_120220	**Sampled by**	Austin Westhuis
Purge Start	10:15	**Gallons Purged**	0.92	**Replicate/ Code No.**			
Purge End	10:50						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:20	0	0	100	7.99	0.13	7.14	0.46	6.13	2.85	11	147	--	--
10:25	5	5	100	8.35	0.26	7.33	0.466	3.09	3.45	11.1	139	--	--
10:30	5	10	100	8.64	0.40	7.33	0.466	2.64	1.94	11.1	137.7	--	--
10:35	5	15	100	8.74	0.53	7.29	0.472	2.12	1.08	11.3	134.4	--	--
10:40	5	20	100	8.79	0.66	7.27	0.468	1.89	1.04	11.1	131	--	--
10:45	5	25	100	8.83	0.79	7.26	0.464	1.8	1.01	11.1	130.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	TW-14-06			**Date**	6/23/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	67, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.98	**Total Depth (ft-bmp)**	86.95	**Water Column(ft)**	21	**Gallons in Well**	3.41
MP Elevation		**Pump Intake (ft-bmp)**	85	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:50	**Volumes Purged**	0.44	**Sample ID**	TW-14-06_062320	**Sampled by**	Marina Samp
Purge Start	10:20	**Gallons Purged**	1.50				
Purge End	11:45			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:25		315	65.98	0.08	8.01	3444	1100	4.8	23.51	6.9	Tan	None
10:30	5	315	65.95	0.17	8.03	3448	512	6.69	17.37	5.4	Tan	None
10:35	5	315	65.9	0.25	8.04	3442	290	1.85	17.32	-3.7	Tan	None
10:40	5	315	65.9	0.33	8.2	3446	285	1.59	18.02	-22.5	Tan	None
10:45	5	315	66.3	0.42	8.33	3411	306	1.54	18.12	-27.9	Tan	None
10:50	5	315	66.3	0.50	8.35	3407	275	1.39	19.45	-34.7	Tan	None
10:55	5	315	65.9	0.58	8.34	3409	347	1.36	20.19	-36.2	Tan	None
11:00	5	315	65.9	0.67	7.97	3469	926	3.75	20.63	1	Tan	None
11:05	5	315	65.9	0.75	7.89	3441	899	3.12	20.87	5.5	Tan	None
11:10	5	315	65.9	0.83	7.77	3436	870	2.73	20.98	10.7	Tan	None
11:15	5	315	65.9	0.92	7.75	3426	851	2.35	21.06	18.9	Tan	None
11:20	5	315	65.9	1.00	7.73	3447	838	2.02	21.19	27	Tan	None
11:25	5	315	65.9	1.08	7.94	3407	832	1.16	22.21	0.1	Tan	None
11:30	5	315	65.9	1.17	8.03	343	906	1.18	22.08	-12.3	Tan	None
11:35	5	315	65.9	1.25	8.01	3410	380	0.66	20.59	-7.7	Tan	None
11:40	5	315	65.9	1.33	8.12	3428	446	0.7	18.23	-6.8	Tan	None
11:45	5	315	65.9	1.41	8.1	3416	716	0.91	18.36	-7.6	Tan	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	40 mL Glass	3	HCL

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Nitrate/Nitrite	125 mL plastic	1	None
TP, TKN		1	H2SO4

Comments: Well not stabilizing, discuss with office, sample with all parameters within 10% except turbidity

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	TW-14-06			**Date**	08/31/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**	63.0 degrees F and Clear. The wind is blowing SE at 37.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.19	**Total Depth (ft-bmp)**	86.8	**Water Column(ft)**	18.61	**Gallons in Well**	3.02
MP Elevation		**Pump Intake (ft-bmp)**	82	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:05	**Volumes Purged**	0.48	**Sample ID**	TW-14-06_083120	**Sampled by**	Billy Cobern
Purge Start	09:10	**Gallons Purged**	1.45	**Replicate/ Code No.**	DUP-03_083118		
Purge End	10:15						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:10	0	0	100	68.19	0.00							--	--
09:15	1426	1426	100	68.27	0.13	7.18	1.89	88.5	6.85	19.6	42.2	--	--
09:20	5	10	100	68.37	0.26	7.04	3.63	78.9	8.36	19.6	45	--	--
09:25	5	15	100	68.41	0.40	6.87	3.62	68.3	7.01	19.8	49.1	--	--
09:30	5	20	100	68.41	0.53	6.84	3.62	64.1	7.04	19.7	48.8	--	--
09:35	5	25	100	68.41	0.66	6.82	3.62	49.8	6.83	19.6	57.9	--	--
09:40	5	30	100	68.41	0.79	6.81	3.62	43.1	6.81	19.5	64	--	--
09:45	5	35	100	68.41	0.92	6.81	3.61	39.8	6.75	19.6	69.1	--	--
09:50	5	40	100	68.41	1.06	6.81	3.61	31.2	6.74	19.8	71.9	--	--
09:55	5	45	100	68.41	1.19	6.81	3.6	25.1	6.75	20	75.9	--	--
10:00	5	50	100	68.41	1.32	6.81	3.6	22.9	6.93	20	76.6	--	--
10:05	5	55	100	68.41	1.45	6.81	3.6	23.8	6.69	20.1	77.2	Brown	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	6	HCL
Nitrate	125 mL Plastic	2	None
Total Phosphorus, TKN	250 mL Plastic	2	H2SO4

Comments: O2=20.9, CO=0, H2S=0, LEL=0, PID=0

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	TW-14-06			**Date**	12/02/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	32.17	**Total Depth (ft-bmp)**	87.35	**Water Column(ft)**	55.18	**Gallons in Well**	8.97
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:40	**Volumes Purged**	0.22	**Sample ID**	TW-14-06_120220	**Sampled by**	Donald Richmond
Purge Start	09:40	**Gallons Purged**	2.00	**Replicate/ Code No.**			
Purge End	11:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:00	0	0	100	32.17	--	7.11	2.34	867	11.71	7	276.6	--	--
10:05	5	5	100	32.17	--	7.11	2.32	1000	11.55	6.6	276.4	--	--
10:10	5	10	100	32.17	--	7.14	2.26	1000	11.85	6	275.7	--	--
10:15	5	15	100	32.17	--	7.15	2.29	1000	11.77	6.9	274.5	--	--
10:20	5	20	100	32.17	--	7.15	2.25	1000	11.71	7.8	272.4	--	--
10:25	5	25	100	32.17	--	7.15	2.24	1000	11.79	8.4	270.8	--	--
10:30	5	30	100	32.17	--	7.17	2.32	1000	11.99	8.1	266	--	--
10:35	5	35	100	32.17	--	7.16	2.35	1000	12.49	8.5	263.7	Dark Brown	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	6	HCL
TKN, total Phosphorus	250 mL Plastic	2	H2SO4
Nitrate	250 mL Plastic	2	None

Comments: DUP-03

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

2020-03-03, TW-15-11

Created	2020-03-03 20:34:31 UTC by Jake Pisarkiewicz
Updated	2020-03-03 20:52:15 UTC by Jake Pisarkiewicz
Location	42.7420832589667, -84.5881145820809
Project Number	30006870
Project Name / Location	RACER Lansing, MI
Sampler Name	Jake Pisarkiewicz
Date	2020-03-03
Well ID	TW-15-11
Are you able to purge and/or sample this well? If not, explain why in the Comments section below.	Yes
Weather	Cold, windy

Evacuation Details

Measuring Point (mp) Description	Top of Casing
Casing Diameter (inches)	2
Static Water Level (ft-bmp)	63.75
Total Depth (ft-bmp)	87
Water Column	23.25
Gallons in Well	3.78
Reference Note: Well Volume Calculation [$\pi r^2 h$, where h= 1foot] Well radius (inch):Volume (Gal./foot):Volume (mL/foot) 0.5" = 0.04 gal/ft = 154 mL/ft 1" = 0.16 gal/ft = 617 mL/ft 2" = 0.65 gal/ft = 2470 mL/ft 3" = 1.47 gal/ft = 5557 mL/ft	
Purge Method	Low-Flow
Type of Equipment used	Bladder
Sample Method	Grab
Sample Depth (ft-bmp) (e.g. pump intake)	84
Purge Start	15:25

@15:35, DTW:62.5, pH:6.54, temp:11.3, cond:3.46, turb:12.6, DO:5.45, redox:36.4

Reading Time	15:35
Rate (mL/min)	50
Depth to Water (ft)	62.5
pH	6.54
Conductivity (mS/cm)	3.46
Turbidity (NTU)	12.6
Dissolved Oxygen (mg/L)	5.45
Temperature (Degrees Celsius)	11.3
Redox (ORP mV)	36.4
parameters	@15:35, DTW:62.5, pH:6.54, temp:11.3, cond:3.46, turb:12.6, DO:5.45, redox:36.4
Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -Turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -Specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit	

@15:40, DTW:62.5, pH:6.52, temp:11.1, cond:3.47, turb:8.67, DO:5.67, redox:43.1

Reading Time	15:40
Minutes Elapsed between readings	5
Rate (mL/min)	50
Depth to Water (ft)	62.5

pH	6.52
Conductivity (mS/cm)	3.47
Turbidity (NTU)	8.67
Dissolved Oxygen (mg/L)	5.67
Temperature (Degrees Celsius)	11.1
Redox (ORP mV)	43.1
parameters	@15:40, DTW:62.5, pH:6.52, temp:11.1, cond:3.47, turb:8.67, DO:5.67, redox:43.1

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -Turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -Specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

@15:45, DTW:62.5, pH:6.52, temp:10.7, cond:3.48, turb:4.2, DO:5.9, redox:47.5

Reading Time	15:45
Minutes Elapsed between readings	5
Rate (mL/min)	50
Depth to Water (ft)	62.5
pH	6.52
Conductivity (mS/cm)	3.48
Turbidity (NTU)	4.2
Dissolved Oxygen (mg/L)	5.9
Temperature (Degrees Celsius)	10.7
Redox (ORP mV)	47.5
parameters	@15:45, DTW:62.5, pH:6.52, temp:10.7, cond:3.48, turb:4.2, DO:5.9, redox:47.5

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -Turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -Specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

@15:50, DTW:62.5, pH:6.52, temp:10.7, cond:3.45, turb:4.33, DO:5.97, redox:49.6

Reading Time	15:50
Minutes Elapsed between readings	5
Rate (mL/min)	50
Depth to Water (ft)	62.5
pH	6.52
Conductivity (mS/cm)	3.45
Turbidity (NTU)	4.33
Dissolved Oxygen (mg/L)	5.97
Temperature (Degrees Celsius)	10.7
Redox (ORP mV)	49.6
parameters	@15:50, DTW:62.5, pH:6.52, temp:10.7, cond:3.45, turb:4.33, DO:5.97, redox:49.6

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -Turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -Specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

@15:55, DTW:62.5, pH:6.52, temp:11.1, cond:3.46, turb:3.1, DO:5.91, redox:50.5

Reading Time	15:55
Minutes Elapsed between readings	5
Rate (mL/min)	50
Depth to Water (ft)	62.5
pH	6.52

Conductivity (mS/cm)	3.46
Turbidity (NTU)	3.1
Dissolved Oxygen (mg/L)	5.91
Temperature (Degrees Celsius)	11.1
Redox (ORP mV)	50.5
parameters	@15:55, DTW:62.5, pH:6.52, temp:11.1, cond:3.46, turb:3.1, DO:5.91, redox:50.5
Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -Turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -Specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit	
Purge End	15:55

Sample Information

Sample Time	16:00
Color	Clear
Notable odors	None

1,4-Dioxane

Constituent Sampled	1,4-Dioxane
Container Type	40 mL Vial
Number of Containers	3
Preservative	HCL

Well Information

Well Location	Plant 3
Condition of Well	Good
Well Locked at Arrival	Yes
Well Locked at Departure	Yes

Signature

Signed 2020-03-03 20:36:14 UTC

Groundwater Sampling Form

Project Number	30042872	**Well ID**	TW-15-11			**Date**	6/23/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	67, sunny
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	64.56	**Total Depth (ft-bmp)**	86.87	**Water Column(ft)**	22	**Gallons in Well**	3.63
MP Elevation		**Pump Intake (ft-bmp)**	84.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	14:00	**Volumes Purged**	0.28	**Sample ID**	TW-15-11_062320	**Sampled by**	Marina Samp
Purge Start	13:05	**Gallons Purged**	1.00				
Purge End	13:55			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
13:10		378	64.97	0.10	8.23	3094	12.1	0.85	15.72	-23.5	None	None
13:15	5	378	64.97	0.20	8.31	3104	5.34	0.61	15.58	-32.5	None	None
13:20	5	378	64.97	0.30	8.44	3125	14.8	0.41	15.48	-43.5	None	None
13:25	5	378	64.87	0.40	8.5	3136	21.1	0.42	15.87	-49.1	None	None
13:30	5	378	64.82	0.50	8.51	3156	14.7	0.54	15.92	-50.2	None	None
13:35	5	378	64.77	0.60	8.49	3160	10.9	0.57	16.05	-48.8	None	None
13:40	5	378	64.77	0.70	8.5	3200	6.99	0.62	16.18	-49.5	None	None
13:45	5	378	64.77	0.80	8.41	3202	5.99	0.59	16.46	-46.8	None	None
13:50	5	378	64.75	0.90	8.45	3252	5.92	0.64	16.44	-48.1	None	None
13:55	5	378	64.75	1.00	8.44	3261	6.73	0.63	16.75	-49.9	None	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3
Condition of Well: Good
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	TW-15-11			**Date**	08/27/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**	81.0 degrees F and Clear. The wind is blowing W at 58.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	68.85	**Total Depth (ft-bmp)**	87	**Water Column(ft)**	18.15	**Gallons in Well**	2.95
MP Elevation		**Pump Intake (ft-bmp)**	83	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:30	**Volumes Purged**	0.40	**Sample ID**	TW-15-11_082720	**Sampled by**	Billy Cobern
Purge Start	10:45	**Gallons Purged**	1.19	**Replicate/ Code No.**			
Purge End	11:35						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:45	0	0	100	68.85	0.00							--	--
10:50	5	5	100	69.03	0.13	6.83	3.6	22.4	6.07	23.4	94.7	--	--
10:55	5	10	100	69.07	0.26	6.69	3.56	14.6	4.45	21.4	86.1	--	--
11:00	5	15	100	69.07	0.40	6.69	3.56	9.27	4.53	20.6	85.4	--	--
11:05	5	20	100	69.07	0.53	6.68	3.52	7.34	4.28	20.4	85.5	--	--
11:10	5	25	100	69.07	0.66	6.68	3.49	7.19	4.16	20.9	85.7	--	--
11:15	5	30	100	69.07	0.79	6.68	3.5	6.02	4.13	21.1	85.8	--	--
11:20	5	35	100	69.07	0.92	6.67	3.52	5.56	4.16	21	85.9	--	--
11:25	5	40	100	69.07	1.06	6.67	3.51	4.92	4.13	21	86.1	--	--
11:30	5	45	100	69.07	1.19	6.67	3.51	4.88	4.11	21.1	86.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL

Comments: O2=20.9, CO=0, H2S=0, LEL=0, PID=0

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	TW-15-11			**Date**	12/01/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	65.88	**Total Depth (ft-bmp)**	87.54	**Water Column(ft)**	21.66	**Gallons in Well**	3.52
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:35	**Volumes Purged**		**Sample ID**	TW-15-11	**Sampled by**	Donald Richmond
Purge Start	10:10	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	12:17						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:15	0	0	100	65.88	--	6.6	2.42	8.59	11.17	8.4	187	--	--
10:20	5	5	100	65.88	--	6.61	2.41	7.1	10.85	8.8	151.3	--	--
10:25	5	10	100	65.88	--	6.6	2.45	9.54	10.85	9.1	122.3	--	--
10:30	5	15	100	65.88	--	6.61	2.45	8.95	10.92	8.8	119.7	--	--
10:35	5	20	100	65.88	--	6.64	2.43	6.35	10.66	8.6	107	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	TW-15-12			**Date**	3/3/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 39°
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	63.4	**Total Depth (ft-bmp)**	80.02	**Water Column(ft)**	16.62	**Gallons in Well**	2.7
MP Elevation	NA	**Pump Intake (ft-bmp)**	74	**Purge Method:**	Low-Flow	**Sample Method**	Grab
Sample Time: 11:20 **Purge Start:** 10:40 **Purge End:** 11:20		**Gallons Purged**	3.00	**Replicate/ Code No.**		**Evacuation Method**	Bladder

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:45	0	200	63.75	0.13	7.7	0.193	11	6.95	12.5	-19.7	Clear	None
10:50	5	200	63.9	0.32	7.02	1.17	17.8	2.39	12.6	6.7	Clear	None
10:55	5	200	63.92	0.53	7.02	1.41	14.1	1.1	12.6	1.1	Clear	None
11:00	5	200	63.95	0.66	7.02	1.44	11.7	0.72	12.6	-4.7	Clear	None
11:05	5	200	63.88	0.79	7.02	1.45	9.58	0.52	12.4	-11.1	Clear	None
11:10	5	200	63.93	0.92	7.01	1.47	9.12	0.42	12.5	-13.4	Clear	None
11:15	5	200	63.95	1.06	7.02	1.48	8.36	0.37	12.7	-16.3	Clear	None
11:20	5	200	63.95	1.32	7.02	1.49	8.1	0.33	12.6	-17.1	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4-Dioxane	40 mL Vial	3	HCL
Total P, TKN	250 mL Plastic	1	H2SO4
Nitrate-N	125 mL Plastic	1	None

Sampling By Anyssa Schember

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Well Locked at Arrival: no

Condition of Well: Good

Well Locked at Departure: no

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	TW-15-12			**Date**	6/2/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	59.45	**Total Depth (ft-bmp)**	78	**Water Column(ft)**	19	**Gallons in Well**	12.06
MP Elevation		**Pump Intake (ft-bmp)**	75	**Purge Method**	Low-Flow	**Sample Method**	Grab
Sample Time	18:15	**Volumes Purged**	0.25	**Sample ID**	TW-15-12_060220	**Sampled by**	D. Stockard
Purge Start	17:15	**Gallons Purged**	3.00				
Purge End	18:15			**Replicate/ Code No.**			

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
17:15		150	59.45	0.00	6.87	1.95	88.5	3.71	16.8	177.1	Pale orange	None
17:25	10	150	59.45	0.00	6.9	2.03	19.1	0.61	16.9	177.4	Pale orange	None
17:30	5	150	59.45	0.00	6.74	2.37	22.9	0.32	15.9	158.4	Pale orange	None
17:50	20	150	59.45	0.00	6.9	2.31	1100	1.03	16.2	70.2	Pale orange	None
17:55	5	150	59.45	0.00	6.91	2.3	514	1.2	16.5	67.4	Pale orange	None
18:00	5	150	60.45	0.00	6.92	2.27	1040	1.54	15.8	61.8	Pale orange	None
18:05	5	150	60.69	0.00	6.92	2.29	1100	1.47	15.7	48.7	Pale orange	None
18:10	5	150	60.69	0.00	6.94	2.29	476	1.47	15.5	36.8	Pale orange	None
18:14	4	150	60.78	0.00	6.92	2.31	691	1.33	15.6	27.9	Pale orange	None

Constituent Sampled	**Container**	**Number**	**Preservative**
1,4-D	40 mL Glass	3	HCL
Nitrate	125 mL Plastic	1	None
TKN and TP	250 mL Plastic	1	H2SO4

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: NA
Well Locked at Arrival:
Well Locked at Departure:
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	TW-15-12			**Date**	08/31/2020
Project Name/Location	Lansing, Michigan		**Weather(°F)**	75.9 degrees F and Mostly Clear. The wind is blowing S/SE at 45.9 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	58.42	**Total Depth (ft-bmp)**	79.5	**Water Column(ft)**	21.08	**Gallons in Well**	3.43
MP Elevation		**Pump Intake (ft-bmp)**	76	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:45	**Volumes Purged**	0.46	**Sample ID**	TW-15-12_083120	**Sampled by**	Billy Cobern
Purge Start	14:45	**Gallons Purged**	1.59	**Replicate/ Code No.**			
Purge End	15:50						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:45	0	0	100	58.42	0.00							--	--
14:50	5	5	100	58.52	0.13	7.82	1.96	276	6.88	24.4	39.1	--	--
14:55	5	10	100	58.54	0.26	7.61	1.98	374	7.62	22	58.8	--	--
15:00	5	15	100	58.57	0.40	7.61	1.98	771	8.22	21.3	67.9	--	--
15:05	5	20	100	58.56	0.53	7.59	1.98	658	8.05	21.2	78.2	--	--
15:10	5	25	100	58.56	0.66	7.56	1.99	632	7.82	21.3	84.4	--	--
15:15	5	30	100	58.56	0.79	7.53	1.99	589	7.81	21.2	85.1	--	--
15:20	5	35	100	58.56	0.92	7.52	1.99	532	8.03	21.1	85.7	--	--
15:25	5	40	100	58.56	1.06	7.5	1.99	498	7.45	21.2	86.5	--	--
15:30	5	45	100	58.56	1.19	7.49	1.99	431	7.75	21.4	-87	--	--
15:35	5	50	100	58.56	1.32	7.48	1.99	422	7.69	21.3	87.7	--	--
15:40	5	55	100	58.56	1.45	7.48	1.99	418	7.29	21.4	88.3	--	--
15:45	5	60	100	58.56	1.59	7.49	1.99	416	7.42	21.4	89.2	Clear	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL
Nitrate	125 mL Plastic	1	None
TKN/Total Phosphorus	250 mL Plastic	1	H2SO4

Comments: O2=20.9, CO=0, H2S=0, LEL=0, PID=0

Well Casing Volume Conversion

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well diameter (inches) = gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 2	Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	TW-15-12			**Date**	12/02/2020
Project Name/Location	RACER Lansing/ Lansing, MI	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	67.32	**Total Depth (ft-bmp)**	79	**Water Column(ft)**	11.68	**Gallons in Well**	1.9
MP Elevation		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	12:40	**Volumes Purged**	1.05	**Sample ID**	TW-15-12_120220	**Sampled by**	Donald Richmond
Purge Start	12:10	**Gallons Purged**	2.00	**Replicate/ Code No.**			
Purge End	13:00						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:20	0	0	100	67.32	--	7.14	1.72	469	6.4	10.2	211.5	--	--
12:25	5	5	100	67.32	--	7.21	1.68	855	8.53	9.5	207.3	--	--
12:30	5	10	100	67.32	--	7.24	1.66	841	8.89	9.4	206.9	--	--
12:35	5	15	100	67.32	--	7.26	1.66	852	9.19	9.6	206.9	Gray	None

Constituent Sampled	Container	Number	Preservative
1,4 Dioxane	40 mL Glass	3	HCL
TKN, total Phosphorus	250 mL Plastic	1	H2SO4
Nitrate	250 mL Plastic	1	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 2

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	UNK-10			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	0.45	**Total Depth (ft-bmp)**	14.5	**Water Column(ft)**	14	**Gallons in Well**	9.13
MP Elevation		**Pump Intake (ft-bmp)**	12	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	11:00	**Volumes Purged**		**Sample ID**	UNK-10	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	#Error						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
10:15		250	0.8	0.00	7.27	0.29	7.52	0.66	16.6	-109.1	Clear	None
10:20	5	250	1.24	0.00	7.24	0.28	8.11	0.32	17.2	-118.5	Clear	None
10:25	5	250	1.24	0.00	7.24	0.28	2.99	0.21	17.2	-127.6	Clear	None
10:30	5	250	1.5	0.00	7.29	0.28	2.65	0.15	17.1	-133.9	Clear	None
10:35	5	250	1.24	0.00	7.28	0.28	10.6	0.12	16.8	-136.4	Clear	None
10:40	5	250	1.5	0.00	7.29	0.29	10.4	0.13	16.3	-137.3	Clear	None
10:45	5	250	1.5	0.00	7.22	0.31	3.75	0.11	16	-134.5	Clear	None
10:50	5	250	1.5	0.00	7.29	0.31	1.37	0.12	15.5	-140.2	Clear	None
10:55	5	250	1.5	0.00	7.29	0.31	1.02	0.11	15.8	-140.8	Clear	None
11:00	5	250	1.5	0.00	7.33	0.31	1.42	0.11	15.7	-144.5	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
VOCs	50 mL Glass	3	HCL

Comments: Black flecks in water

Well Casing Volume Conversion

Well diameter (inches) 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
= gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	UNK-11			**Date**	6/8/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	1	**Total Depth (ft-bmp)**	11.8	**Water Column(ft)**	11	**Gallons in Well**	1.75
MP Elevation		**Pump Intake (ft-bmp)**	9.5	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	09:50	**Volumes Purged**		**Sample ID**	UNK-11	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	#Error						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
08:45		250	1.76	0.00	8.17	0.3	34	3.42	16.6	145.5	Clear	None
08:50	5	250	2.35	0.00	8.26	0.6	34.1	3.17	17	132.9	Clear	None
08:55	5	250	2.97	0.00	8.3	0.3	14.4	3.1	17	124.6	Clear	None
09:00	5	250	3.54	0.00	8.28	0.31	13.5	3.4	16.6	122.3	Clear	None
09:05	5	250	4.09	0.00	8.17	0.31	8.72	3	16.7	119.1	Clear	None
09:10	5	250	4.58	0.00	8.08	0.32	9.02	2.57	16.8	115	Clear	None
09:15	5	250	4.58	0.00	8.06	0.32	9	2.78	16.9	114	Clear	None
09:20	5	250	4.62	0.00	8.02	0.34	12.8	2.42	15.7	110.7	Clear	None
09:25	5	250	5.1	0.00	7.84	0.34	10.8	2.11	16.2	113	Clear	None
09:30	5	250	5.62	0.00	7.88	0.34	10.2	2.22	16.2	99.2	Clear	None
09:35	5	250	5.9	0.00	7.85	0.34	13.1	2.21	16.1	87.9	Clear	None
09:40	5	250	6.11	0.00	7.84	0.34	12.6	2.36	16.4	76.9	Clear	None
09:45	5	250	6.77	0.00	7.83	0.34	11.5	3.28	15.2	42.6	Clear	None
09:50	5	250	7.01	0.00	7.82	0.34	10.2	3.07	15.4	40.5	Clear	None

Constituent Sampled	Container	Number	Preservative
SVOCs	1L Amber	2	None
VOCs	50 mL Glass	3	HCL

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Well Information

Well Location:	Plant 3	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

RACER Lansing GW Sampling

Project Number	30042872	**Well ID**	UNK-15			**Date**	3/3/2020
Project Name/Location	RACER Lansing, MI					**Weather(°F)**	Cloudy, 40F
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**		**Casing Diameter (in.)**	2	**Well Material**	
Static Water Level (ft-bmp)	0.39	**Total Depth (ft-bmp)**	15.65	**Water Column(ft)**	15.26	**Gallons in Well**	2.48
MP Elevation	NA	**Pump Intake (ft-bmp)**	13.26	**Purge Method:**	Low-Flow	**Sample Method**	Low-Flow
Sample Time:	14:20	**Gallons Purged**		**Replicate/ Code No.**	NA	**Evacuation Method**	Peristaltic
Purge Start:	13:55						
Purge End:	14:25						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
14:00	0	200	0.39	0.26	8.51	0.4	2.69	1.98	7.9	136.5	Clear	None
14:05	5	200	0.39	0.53	8.55	0.399	2.11	1.89	7.8	130.3	Clear	None
14:10	5	200	0.39	0.79	8.54	0.399	1.81	1.85	7.8	128.9	Clear	None
14:15	5	200	0.39	1.06	8.57	0.399	1.62	1.94	7.9	127.8	Clear	None
14:20	5	200	0.39	1.32	8.57	0.399	1.49	1.95	7.9	126.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Sampling By Austin Westhuis

Comments:

Well Casing Volume Conversion

Well diameter(inc)=gallons per foot 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:

Condition of Well: Good

Well Locked at Arrival: no

Well Locked at Departure: no

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
S.U. = Standard Units

Groundwater Sampling Form

Project Number	30042872	**Well ID**	UNK-15			**Date**	6/5/2020
Project Name/Location	Lansing, MI					**Weather(°F)**	Sunny, 80s
Measuring Pt. Description	Top of Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	0.5	**Total Depth (ft-bmp)**	15.8	**Water Column(ft)**	15	**Gallons in Well**	9.94
MP Elevation		**Pump Intake (ft-bmp)**	9	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:40	**Volumes Purged**		**Sample ID**	UNK-15	**Sampled by**	Jessica Fransted
Purge Start	#Error	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	#Error						

Time	Minutes Elapsed	Rate (mL/min)	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
											Color	Odor
09:40		250	0.5	0.00	7.89	0.69	21.1	0.8	17.1	79	Clear	None
09:45	5	250	0.5	0.00	7.83	0.69	5.83	0.65	17.2	64.4	Clear	None
09:50	5	250	0.5	0.00	7.84	0.69	2.15	0.62	17.2	59.8	Clear	None
09:55	5	250	1.18	0.00	7.85	0.69	7.29	0.5	16.9	43.9	Clear	None
10:00	5	250	1.52	0.00	7.87	0.69	10.3	0.5	16.5	37.5	Clear	None
10:05	5	250	1.79	0.00	7.87	0.69	14.5	0.46	16.7	32.5	Clear	None
10:10	5	250	1.91	0.00	7.87	0.69	8.77	0.44	16.7	29.2	Clear	None
10:15	5	250	2.18	0.00	7.88	0.69	10.3	0.47	16.8	24.5	Clear	None
10:20	5	250	2.36	0.00	7.88	0.69	10.1	0.51	16.7	21.9	Clear	None
10:25	5	250	2.5	0.00	7.89	0.69	5.78	0.6	16.6	19.7	Clear	None
10:30	5	250	2.7	0.00	7.89	0.69	10.3	0.63	16.9	17.7	Clear	None
10:35	5	250	2.7	0.00	7.88	0.69	10.3	0.6	16.8	20.7	Clear	None
10:40	5	250	2.9	0.00	7.88	0.69	10.3	0.6	16.9	20.2	Clear	None

Constituent Sampled	**Container**	**Number**	**Preservative**
PFAS	250 mL Plastic	2	None

Comments: Missing screws

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot
1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location: Plant 3

Well Locked at Arrival: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliiSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	UNK-15			**Date**	08/27/2020
Project Name/Location	RACER Lansing/Lansing, MI		**Weather(°F)**	91.0 degrees F and Clear. The wind is blowing undefined at 0.0 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	1.53	**Total Depth (ft-bmp)**	15.63	**Water Column(ft)**	14.1	**Gallons in Well**	2.29
MP Elevation		**Pump Intake (ft-bmp)**	13.13	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	15:05	**Volumes Purged**		**Sample ID**	UNK-15_082720	**Sampled by**	Austin Westhuis
Purge Start	14:40	**Gallons Purged**		**Replicate/ Code No.**			
Purge End	15:10						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:45	0	0	100	1.63	0.13	7.84	0.72	5.95	0.3	23.8	-61.8	--	--
14:50	5	5	100	1.67	0.26	7.89	0.72	1.66	0.1	24.1	-84.6	--	--
14:55	5	10	100	1.67	0.40	7.92	0.72	1.22	0.1	23.8	-95.5	--	--
15:00	5	15	100	1.69	0.53	7.94	0.72	1.16	0.1	23.8	-95.9	--	--
15:05	5	20	100	1.73	0.66	7.95	0.72	1.08	0.1	23.8	-97	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:	See figure	Well Locked at Arrival:	no
Condition of Well:	Good condition	Well Locked at Departure:	no
Well Completion:	Flush mount	Key Number To Well:	2035

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Groundwater Sampling Form

Project Number	30042872	**Well ID**	UNK-15			**Date**	12/08/2020
Project Name/Location	RACER Lansing / Lansing, MI		**Weather(°F)**	35 °F, Overcast, SW winds at 5 mph.			
Measuring Pt. Description	Top of Inner Casing	**Screen Setting (ft-bmp)**	--	**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	0.51	**Total Depth (ft-bmp)**	15.65	**Water Column(ft)**	15.14	**Gallons in Well**	9.84
MP Elevation		**Pump Intake (ft-bmp)**	13.15	**Purge Method**	Low-Flow	**Sample Method**	Low-Flow
Sample Time	10:00	**Volumes Purged**	0.09	**Sample ID**	UNK-15_120820	**Sampled by**	Austin Westhuis
Purge Start	09:25	**Gallons Purged**	0.92	**Replicate/ Code No.**			
Purge End	10:05						

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallons Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:30	0	0	100	1.00	0.13	7.5	0.55	4.11	1.49	11.7	119.1	--	--
09:35	5	5	100	1.31	0.26	7.58	0.54	2.18	1.39	11.6	114.5	--	--
09:40	5	10	100	1.62	0.40	7.56	0.54	1.66	1.37	11.5	116.8	--	--
09:45	5	15	100	1.62	0.53	7.55	0.54	1.29	1.34	11.5	118.5	--	--
09:50	5	20	100	1.79	0.66	7.55	0.54	1.2	1.32	11.6	118.8	--	--
10:00	10	30	100	1.85	0.92	7.55	0.54	1.03	1.33	11.5	119.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Flush mount	Key Number To Well:	6000B

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

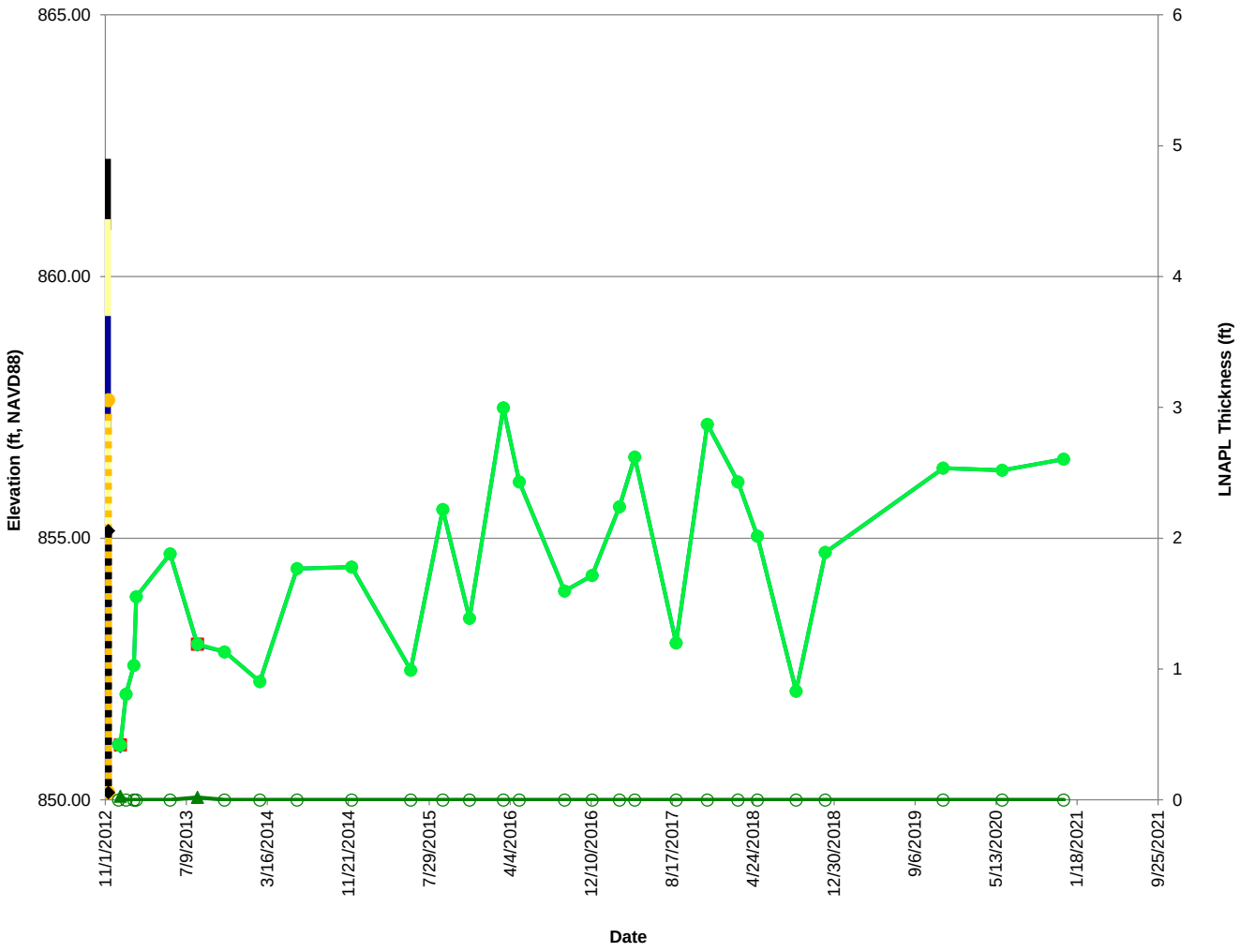
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

Appendix D

LNAPL Trend Graphs

(on attached CD)



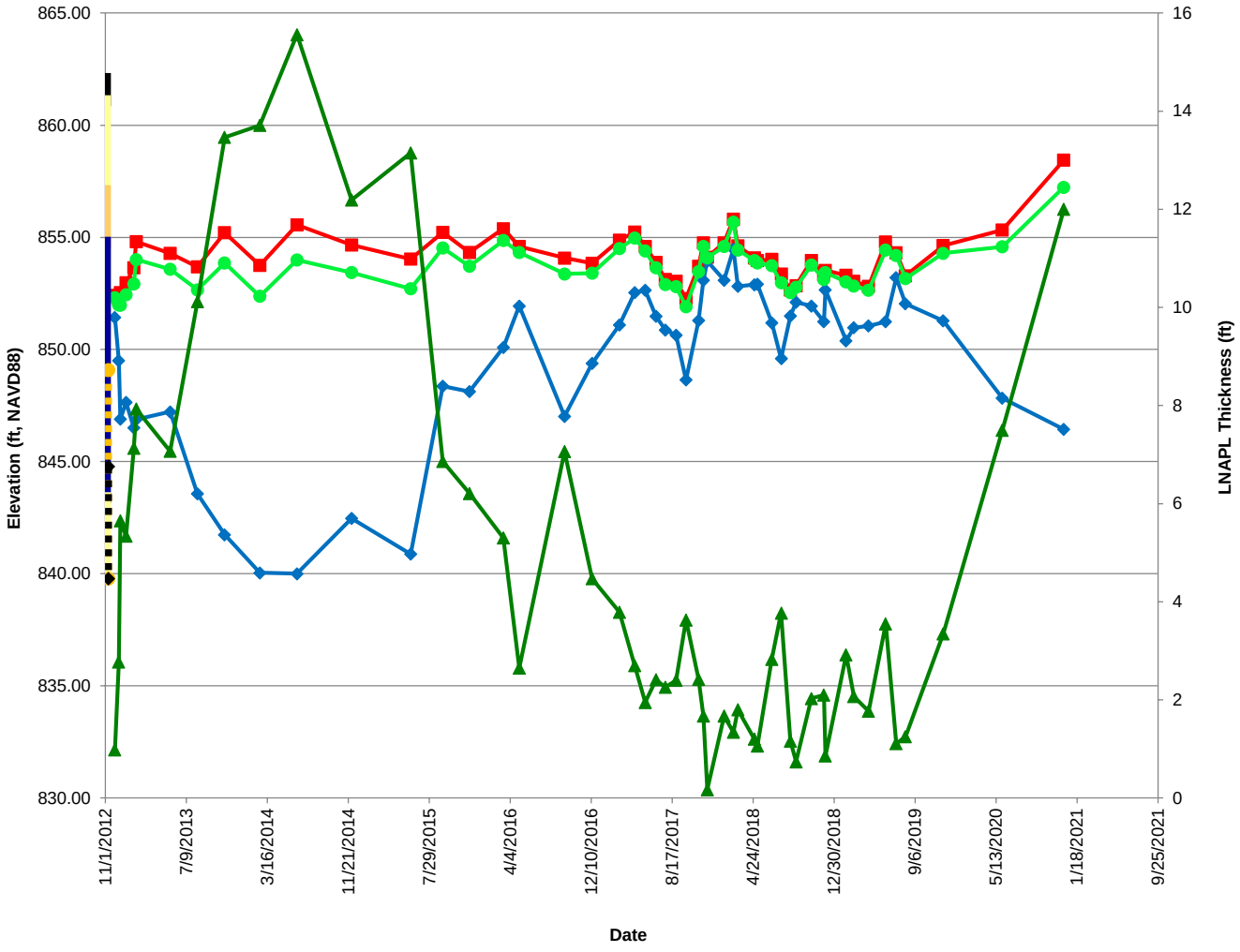
RACER Lansing
Lansing, MI

LMW-12-01 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

A



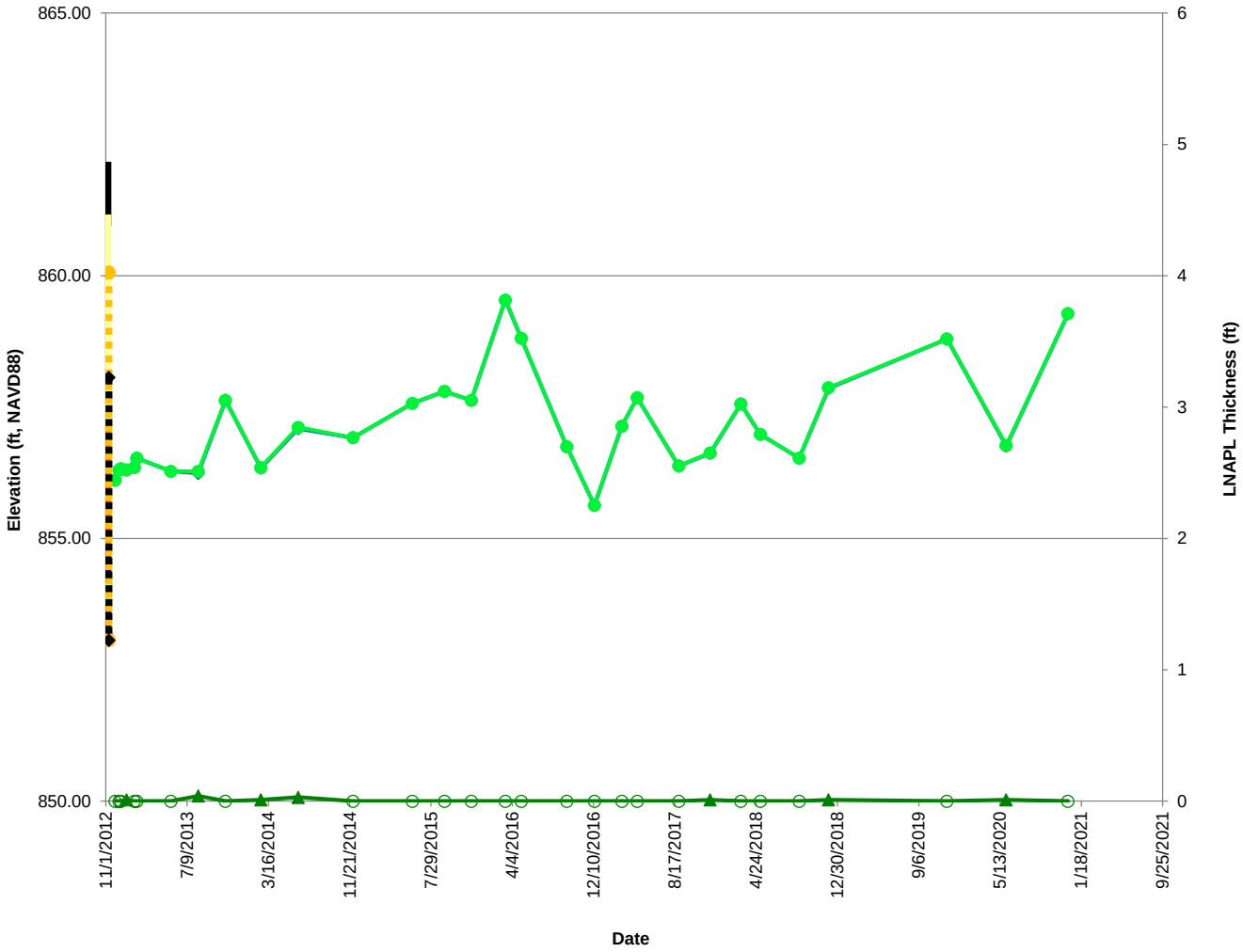
RACER Lansing
Lansing, MI

LMW-12-03D LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

A



RACER Lansing
Lansing, MI

LMW-12-03S LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

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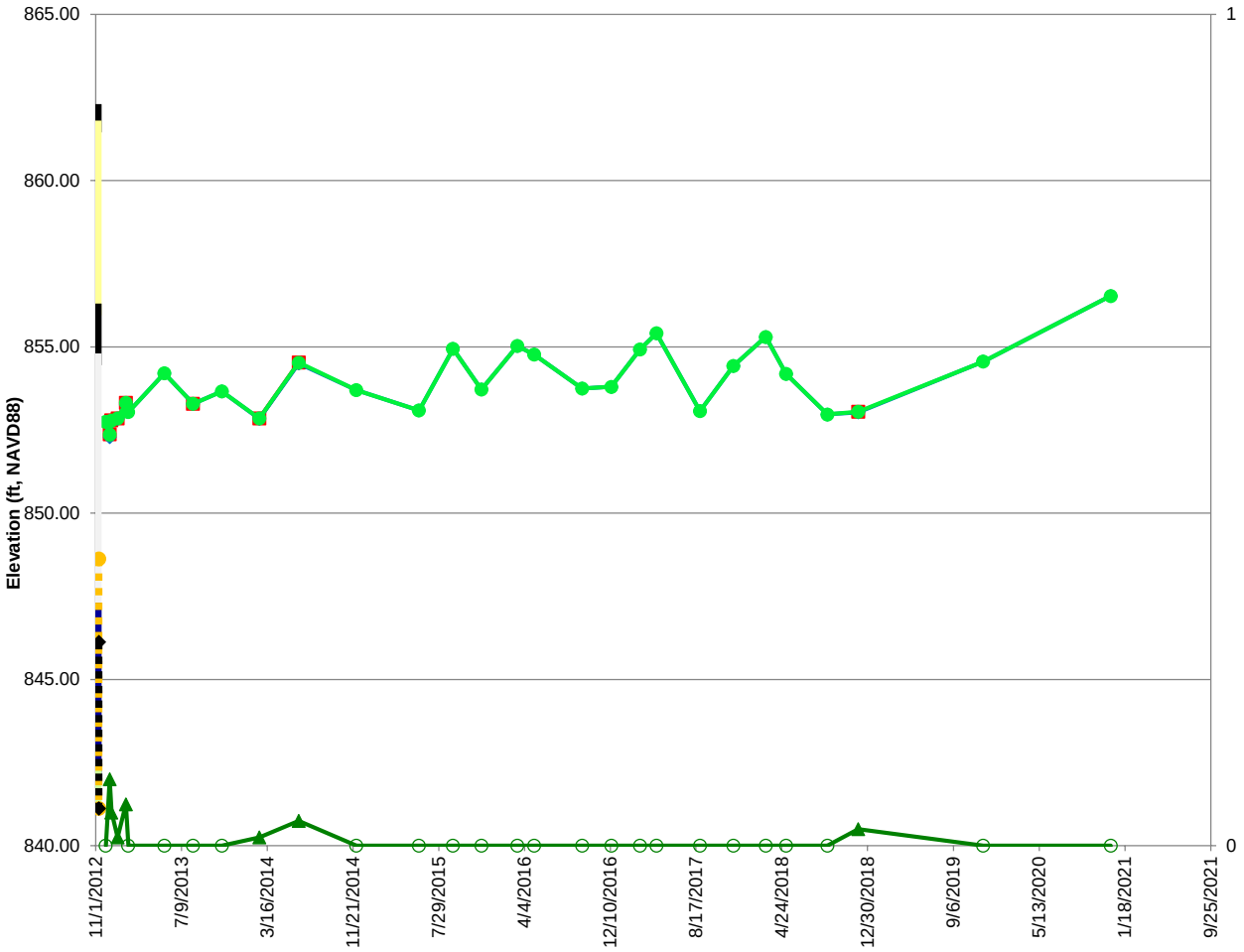

RACER Lansing
Lansing, MI

LMW-12-04 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

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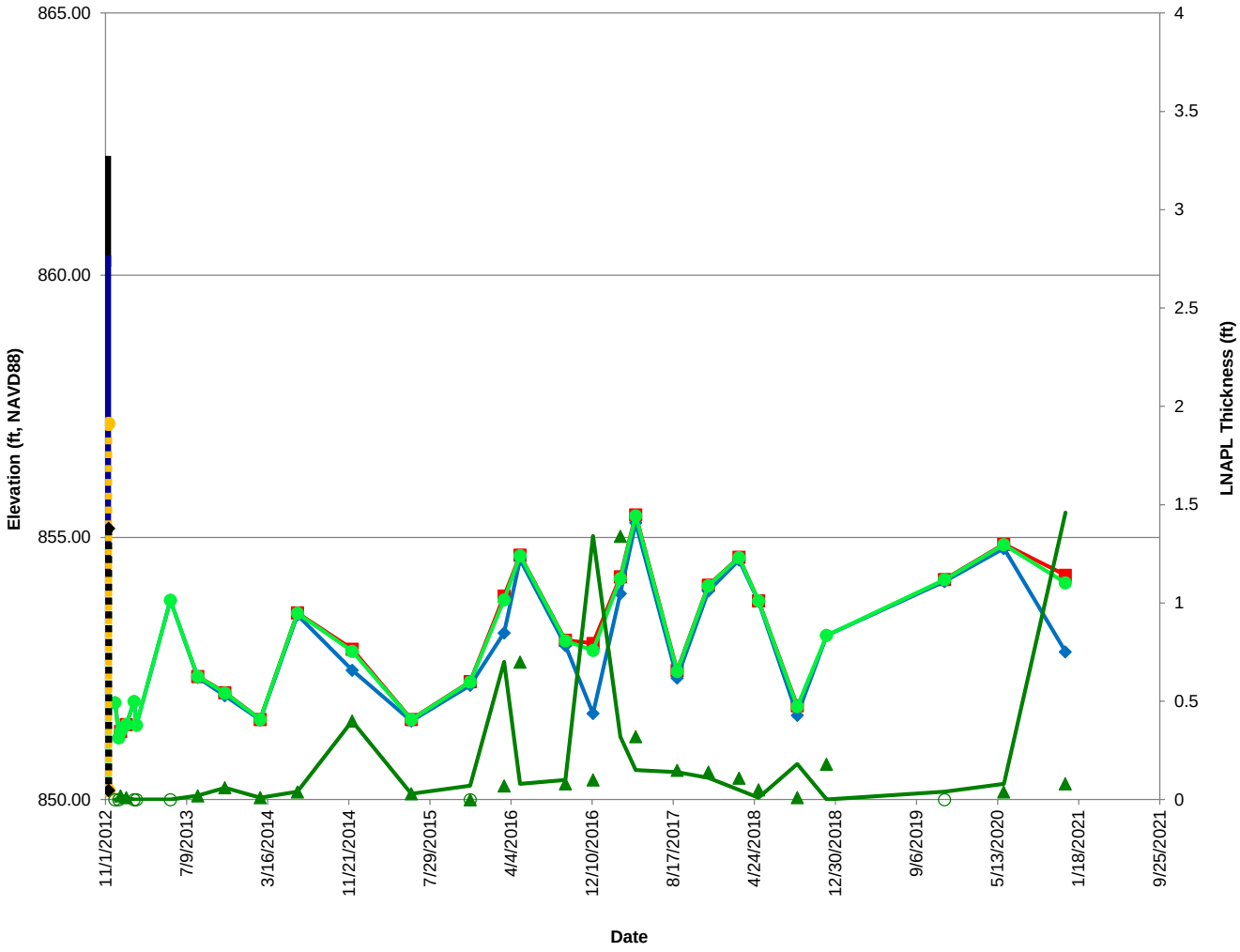

RACER Lansing
Lansing, MI

LMW-12-05 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE
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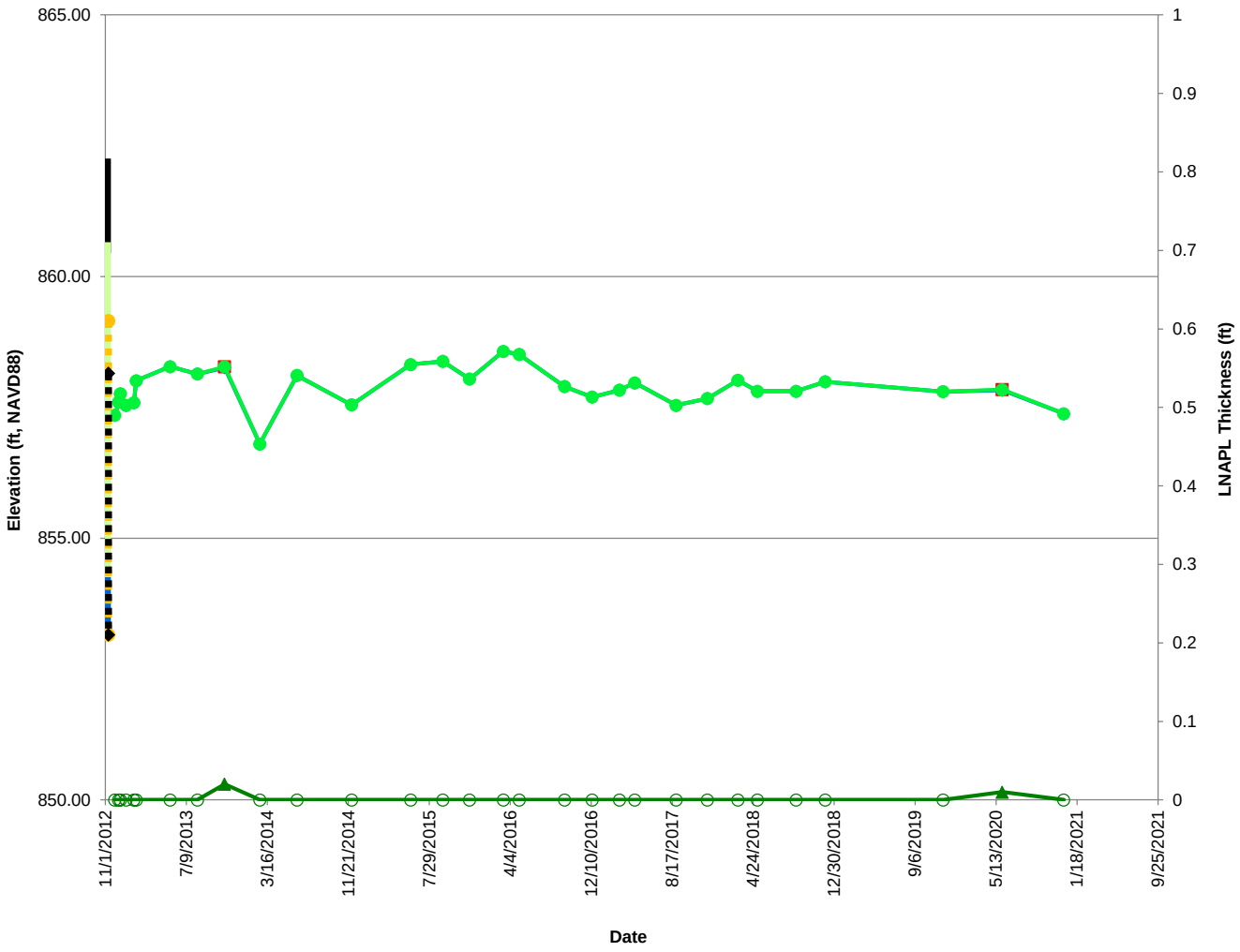

RACER Lansing
Lansing, MI

LMW-12-06 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

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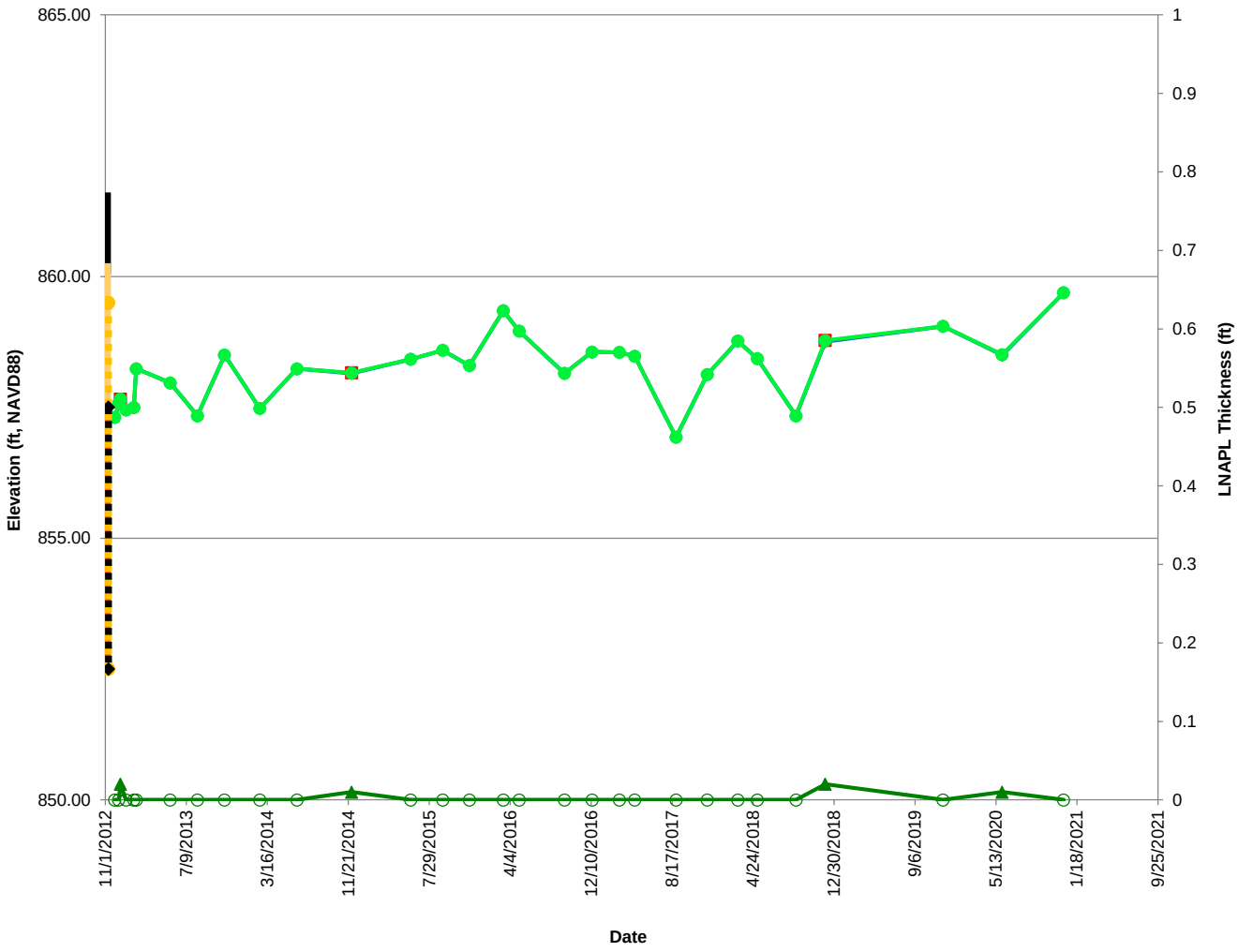

RACER Lansing
Lansing, MI

LMW-12-07 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

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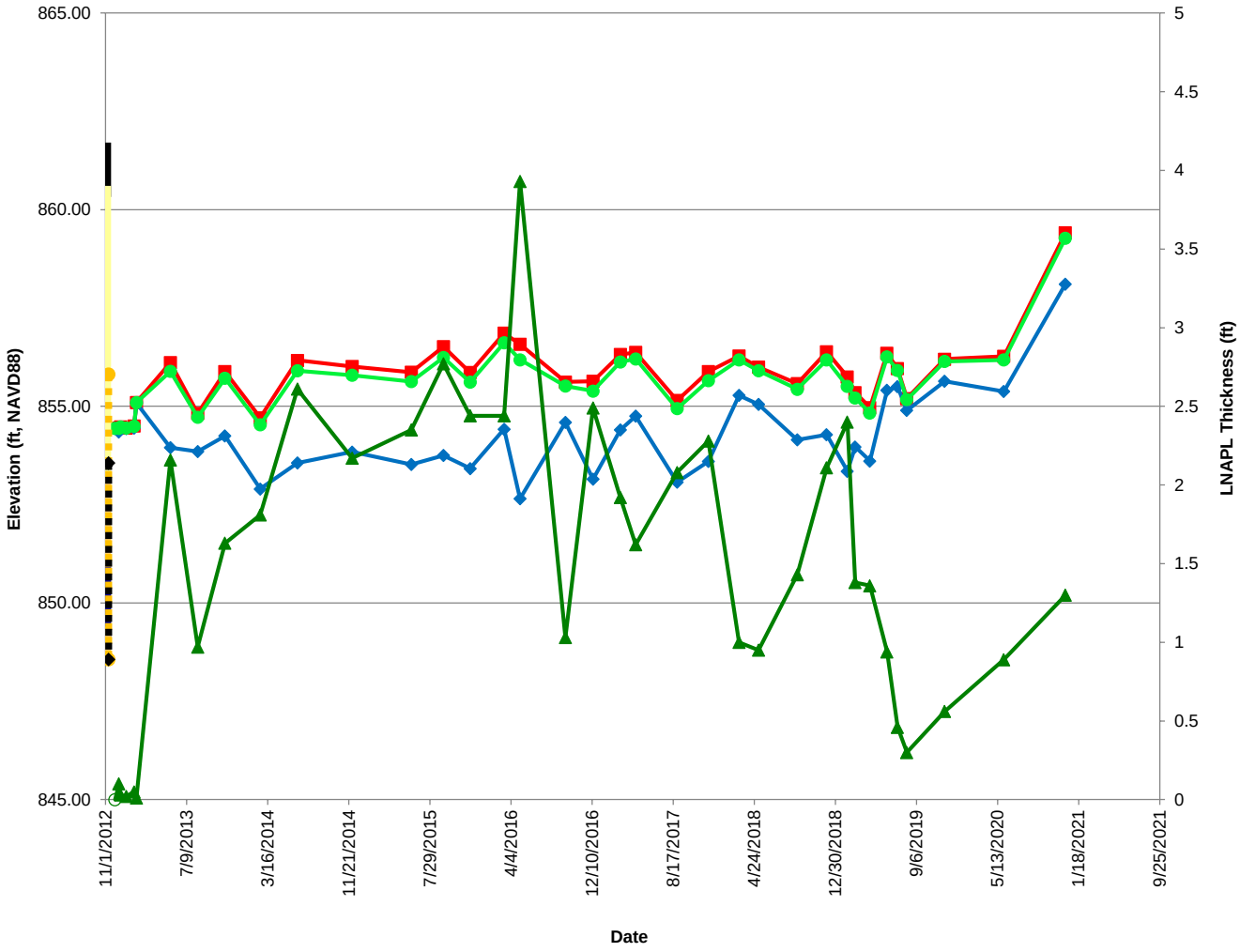

RACER Lansing
Lansing, MI

LMW-12-08 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE
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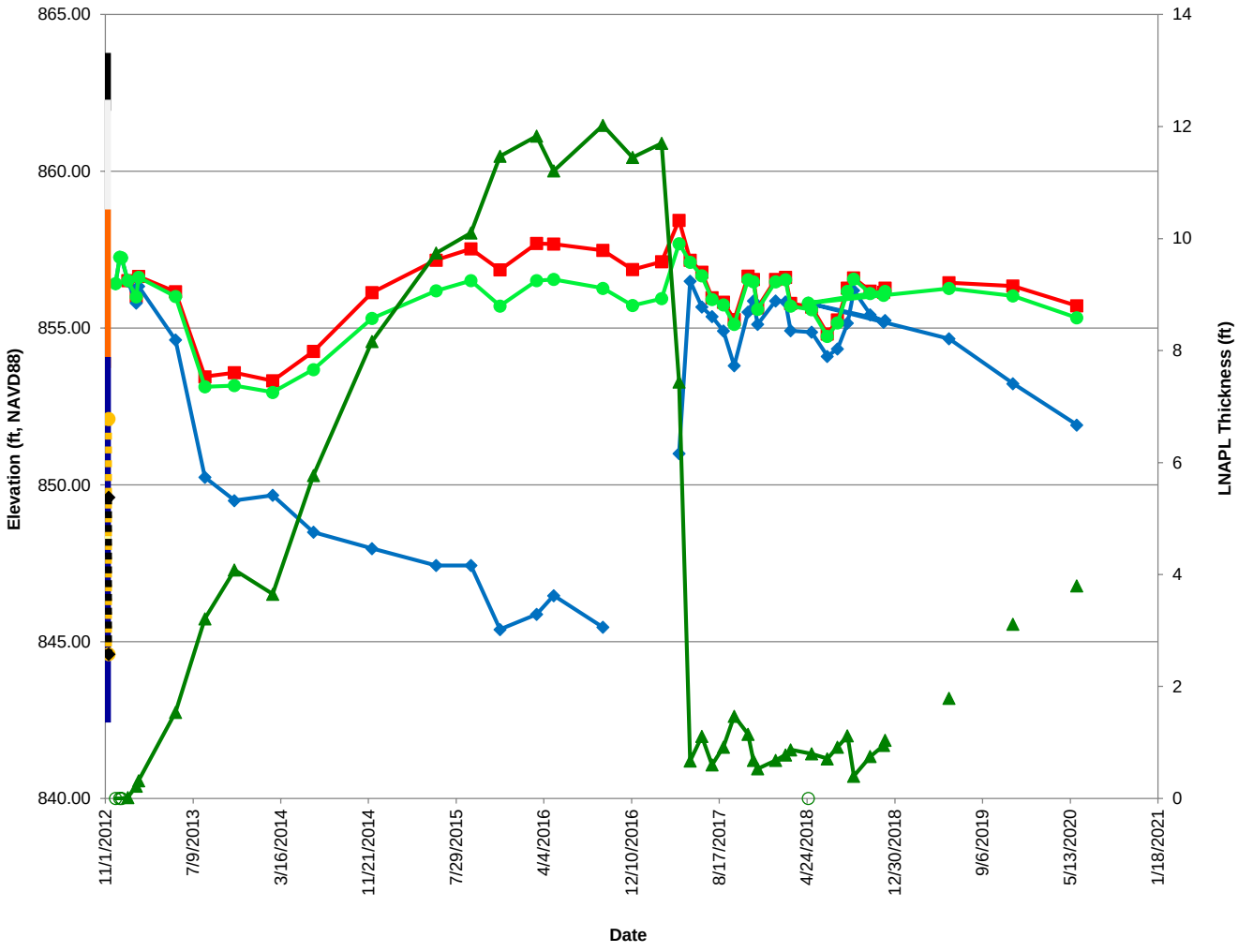

RACER Lansing
Lansing, MI

LMW-12-10 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE
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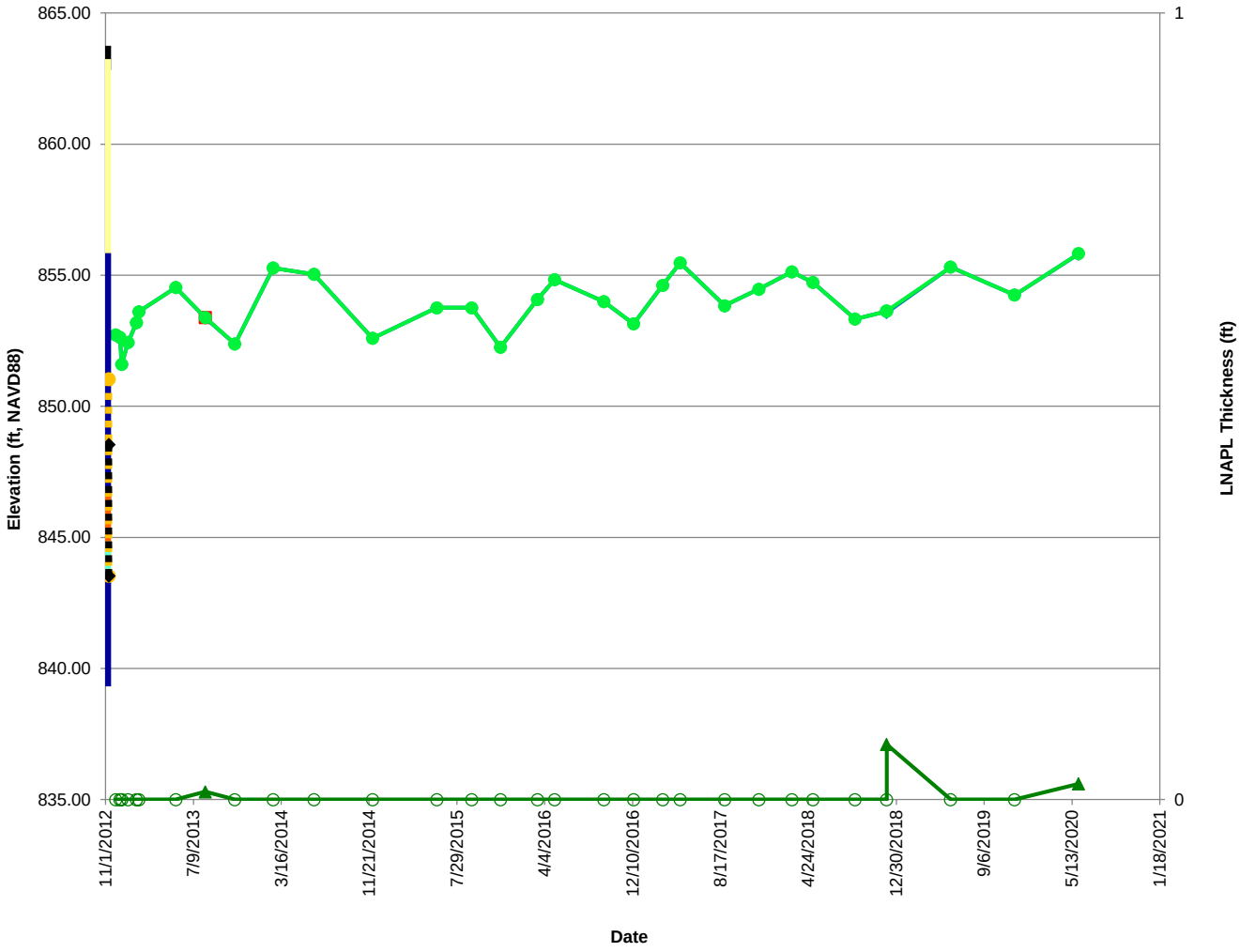

RACER Lansing
Lansing, MI

LMW-12-11 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

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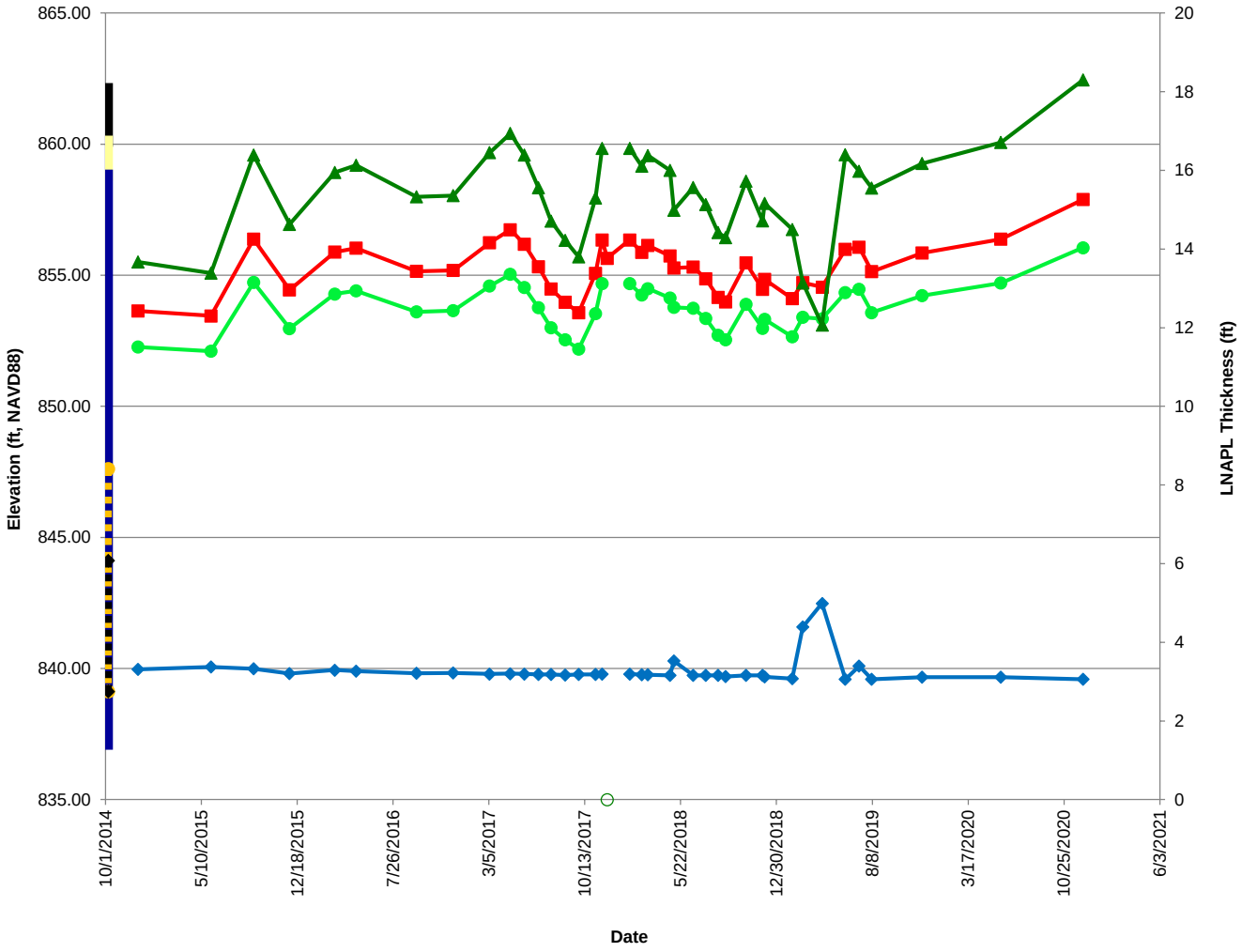


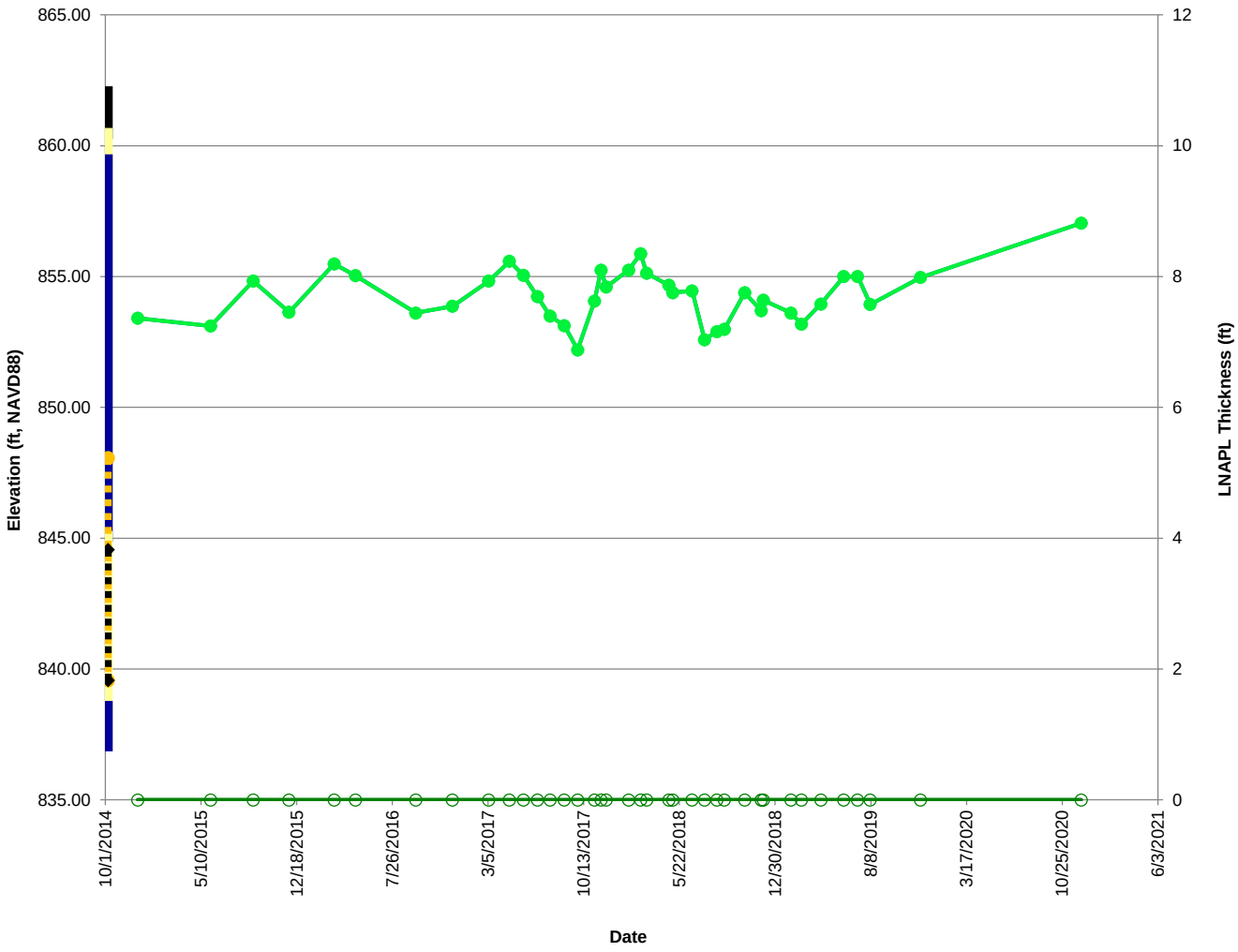
RACER Lansing
Lansing, MI

LMW-14-12D LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

A



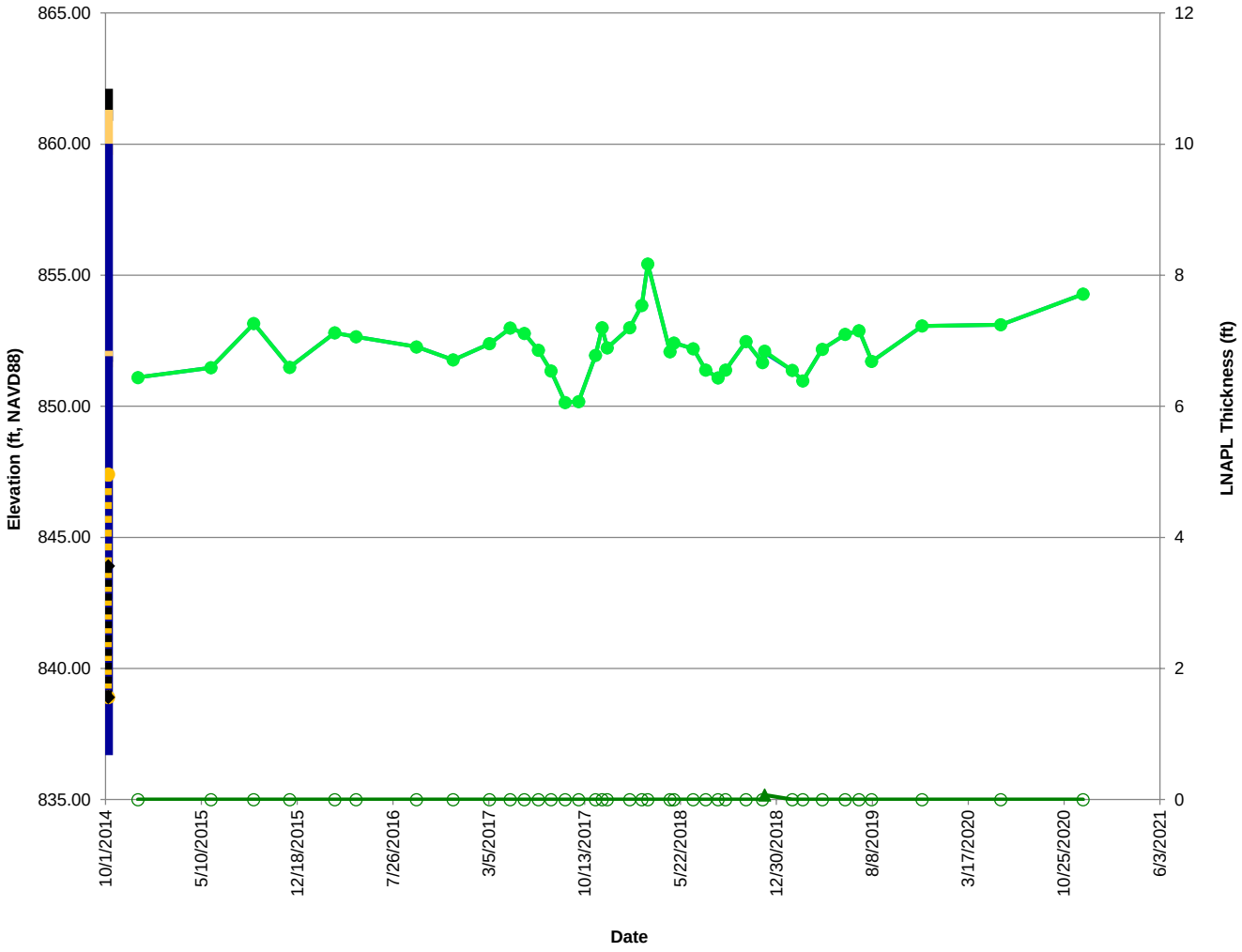
RACER Lansing
Lansing, MI

LMW-14-13D LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

A



RACER Lansing
Lansing, MI

LMW-14-14D LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

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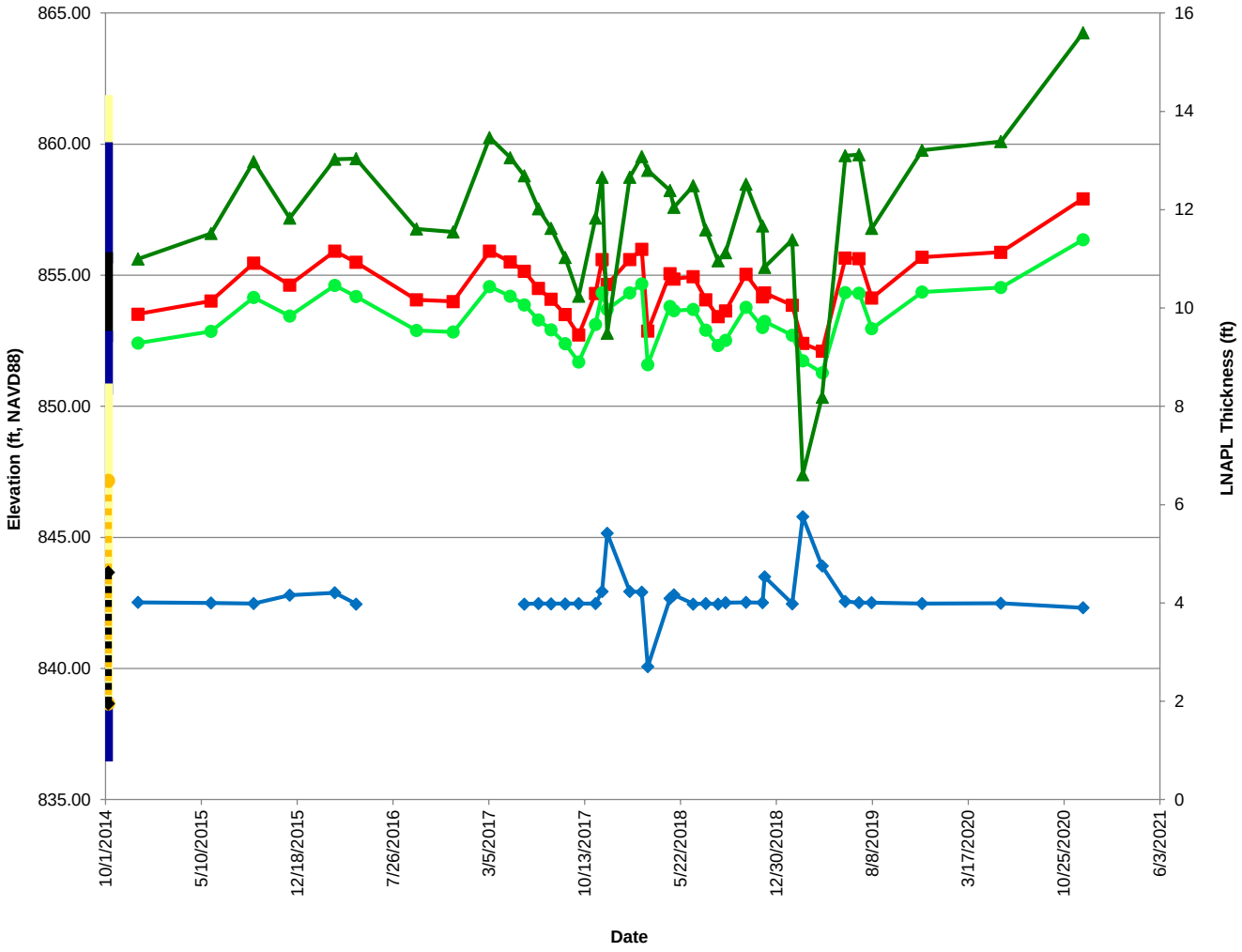


Air-NAPL Interface

NAPL-Water or Air-Water Interface

Potentiometric Surface

Concrete

Medium Sand

Clay

Filter Pack

Screened Interval

NAPL Thickness

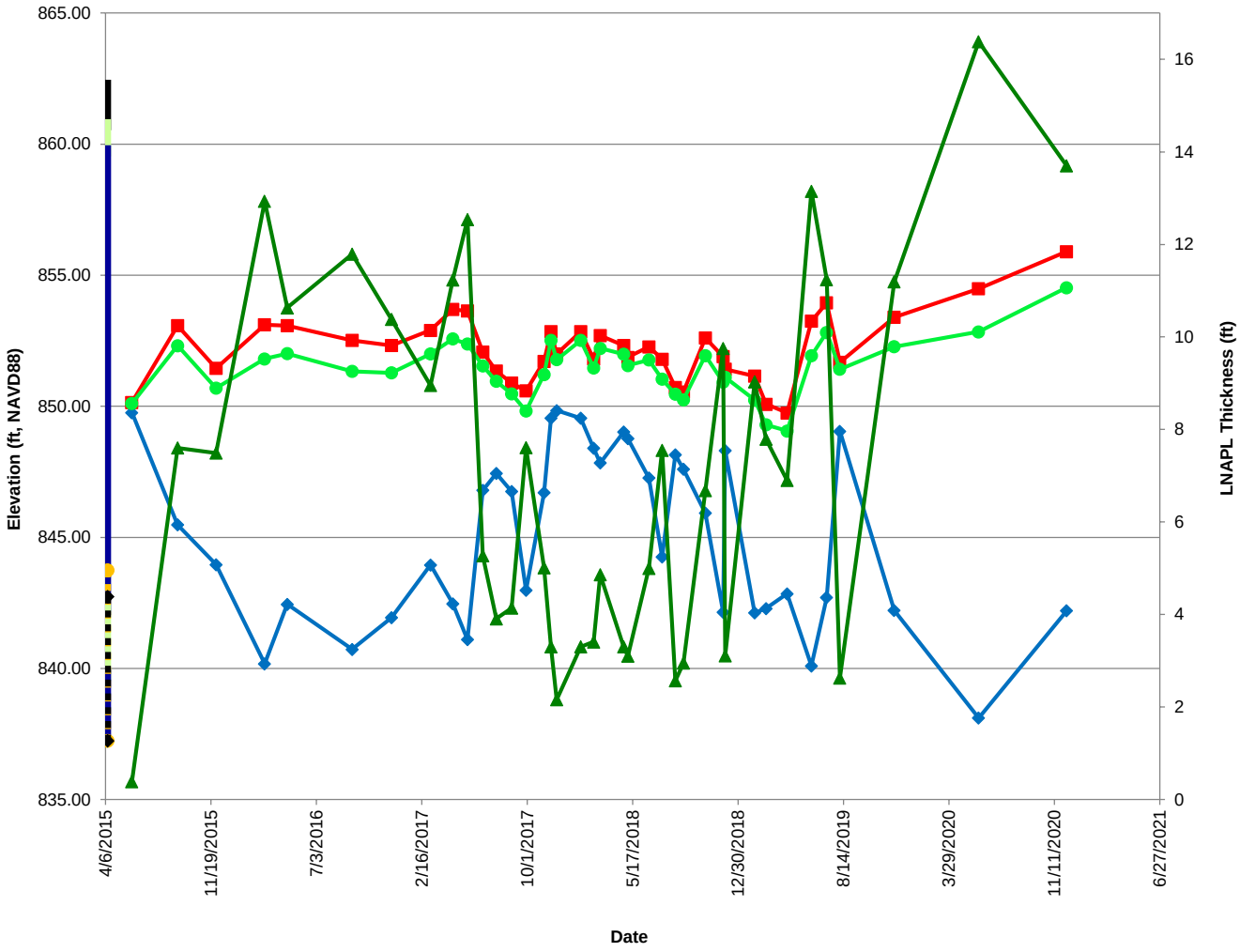
RACER Lansing
Lansing, MI

LMW-14-15D LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

A



RACER Lansing
Lansing, MI

LMW-15-16D LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

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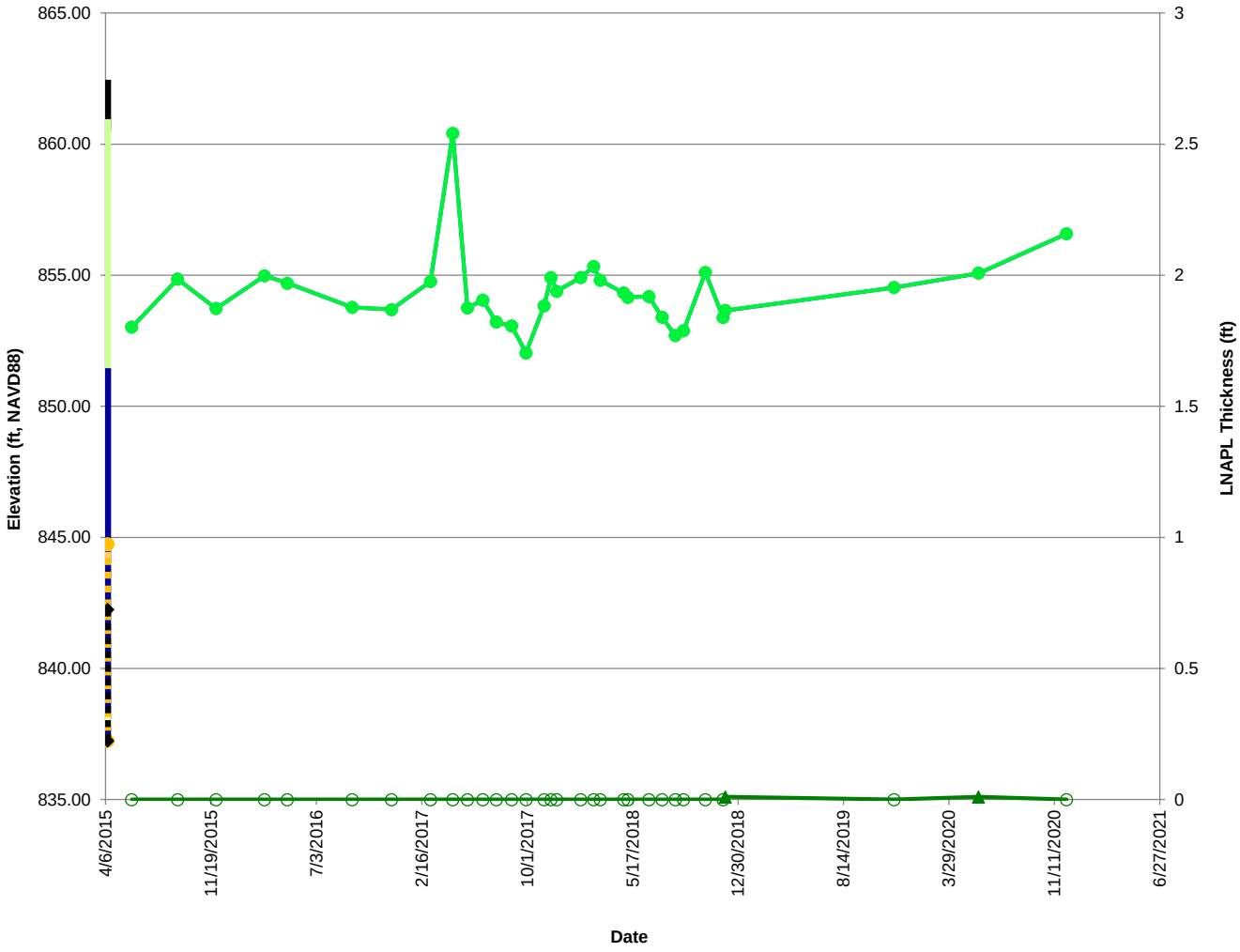

RACER Lansing
Lansing, MI

LMW-15-17D LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

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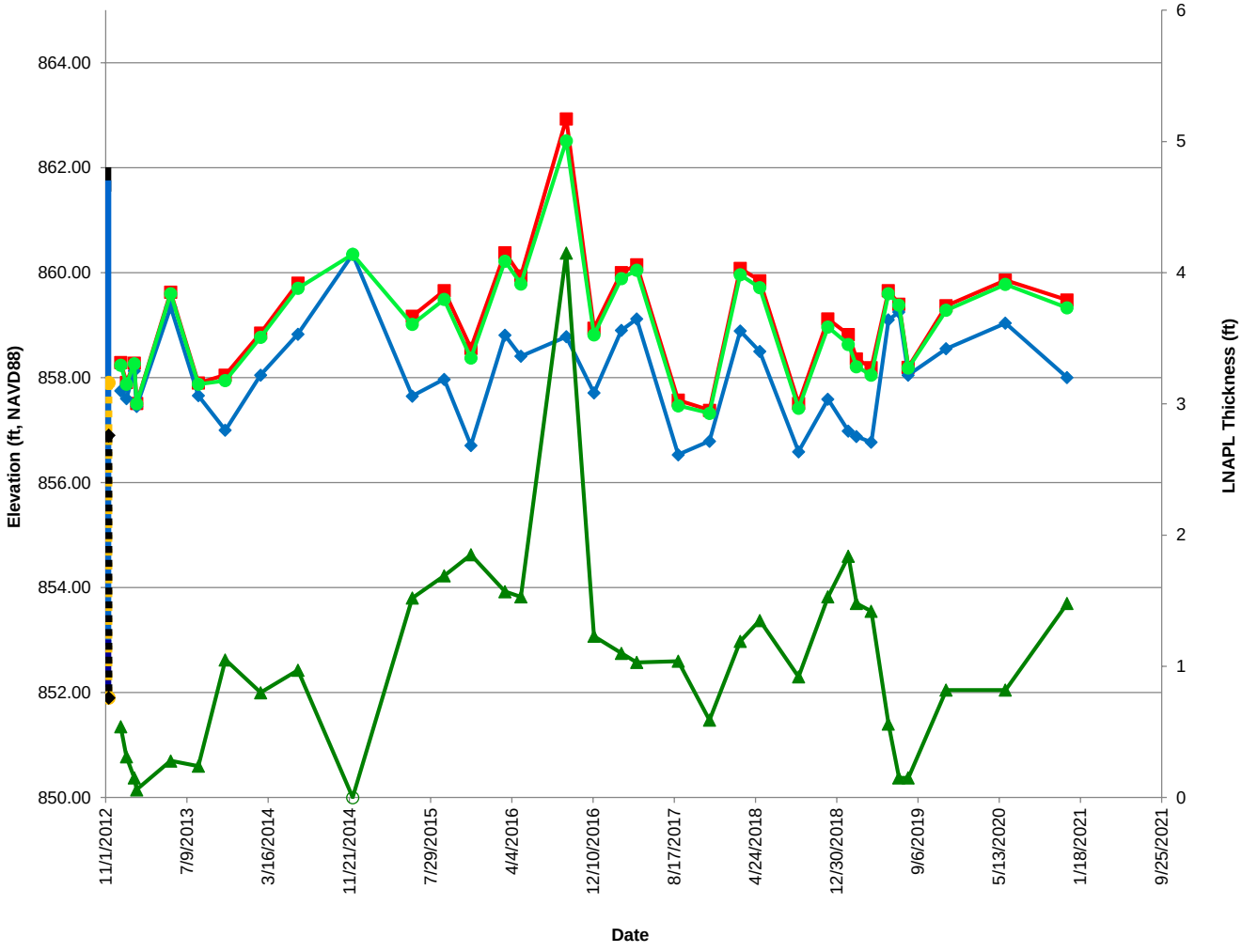

RACER Lansing
Lansing, MI

P2-SB-37 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE
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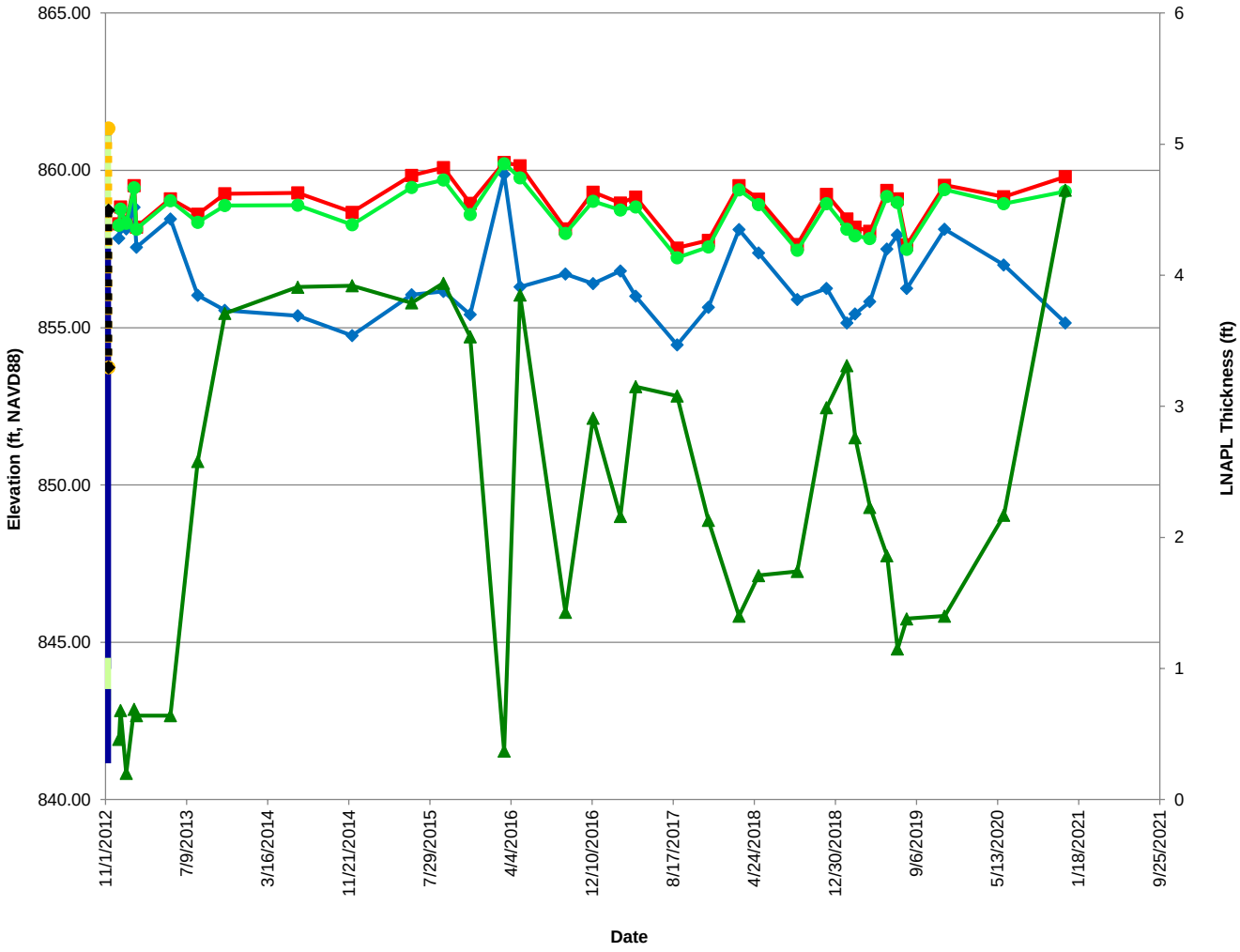


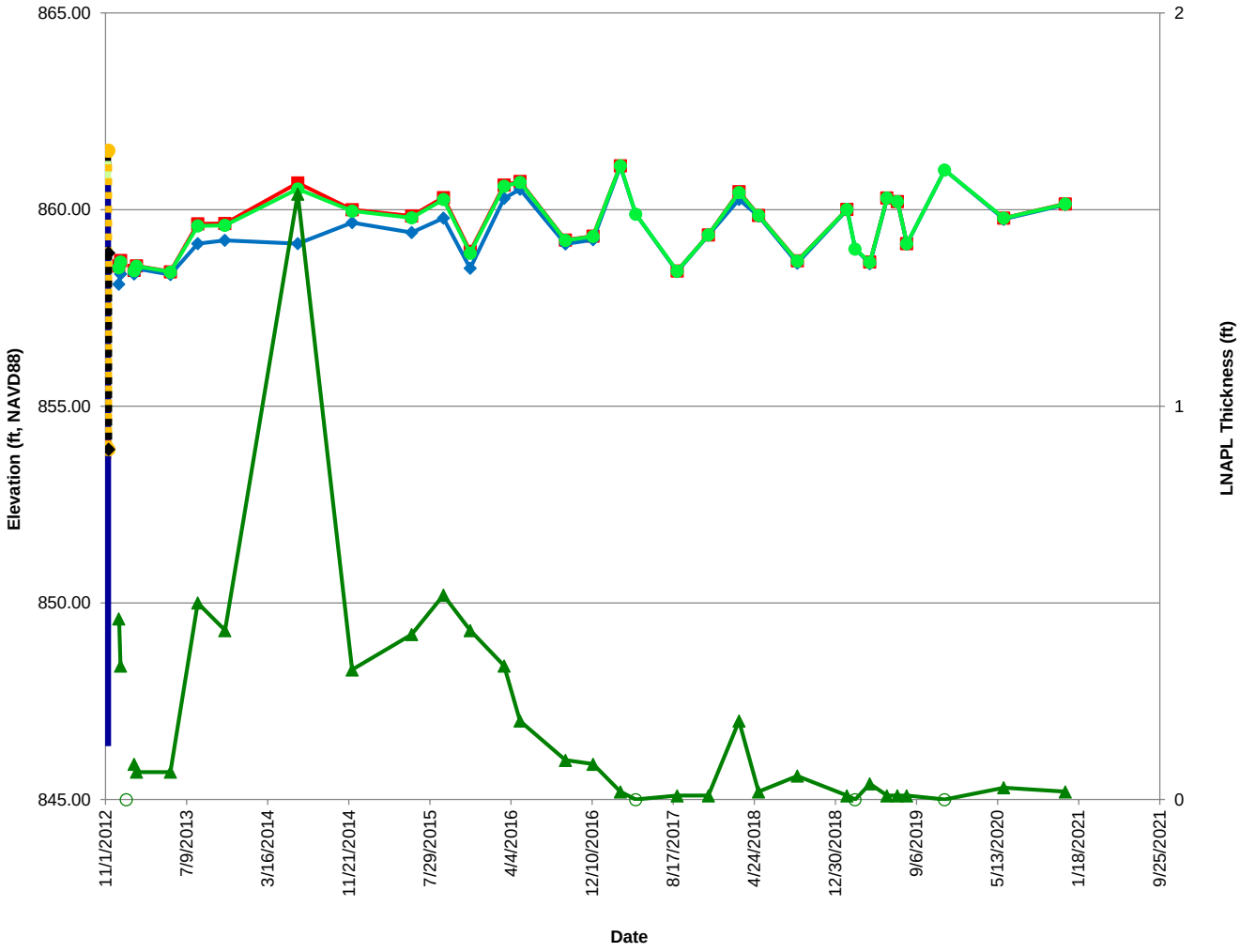
RACER Lansing
Lansing, MI

PMW-1 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

A



RACER Lansing
Lansing, MI

PMW-2 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE

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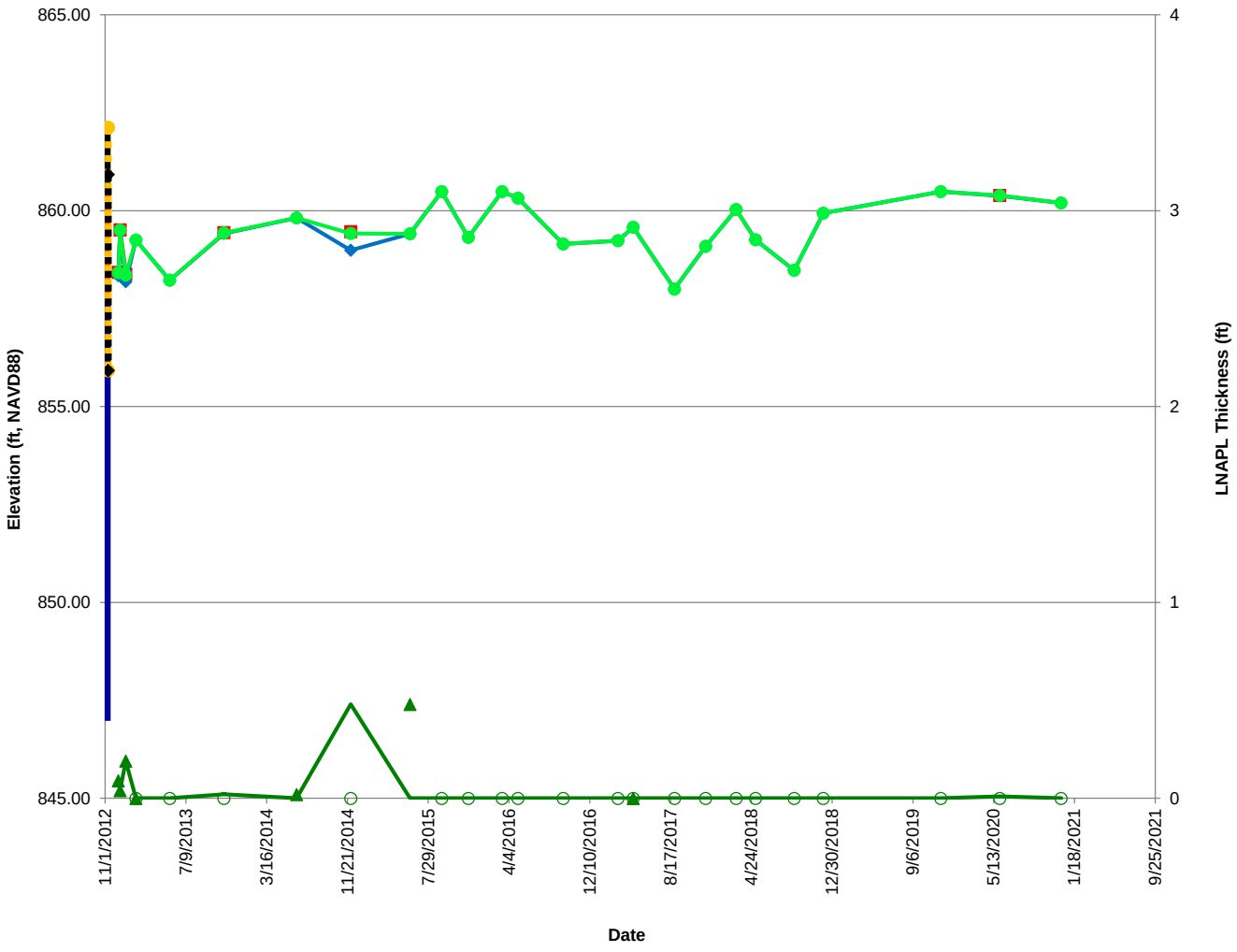

RACER Lansing
Lansing, MI

PMW-3 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

FIGURE
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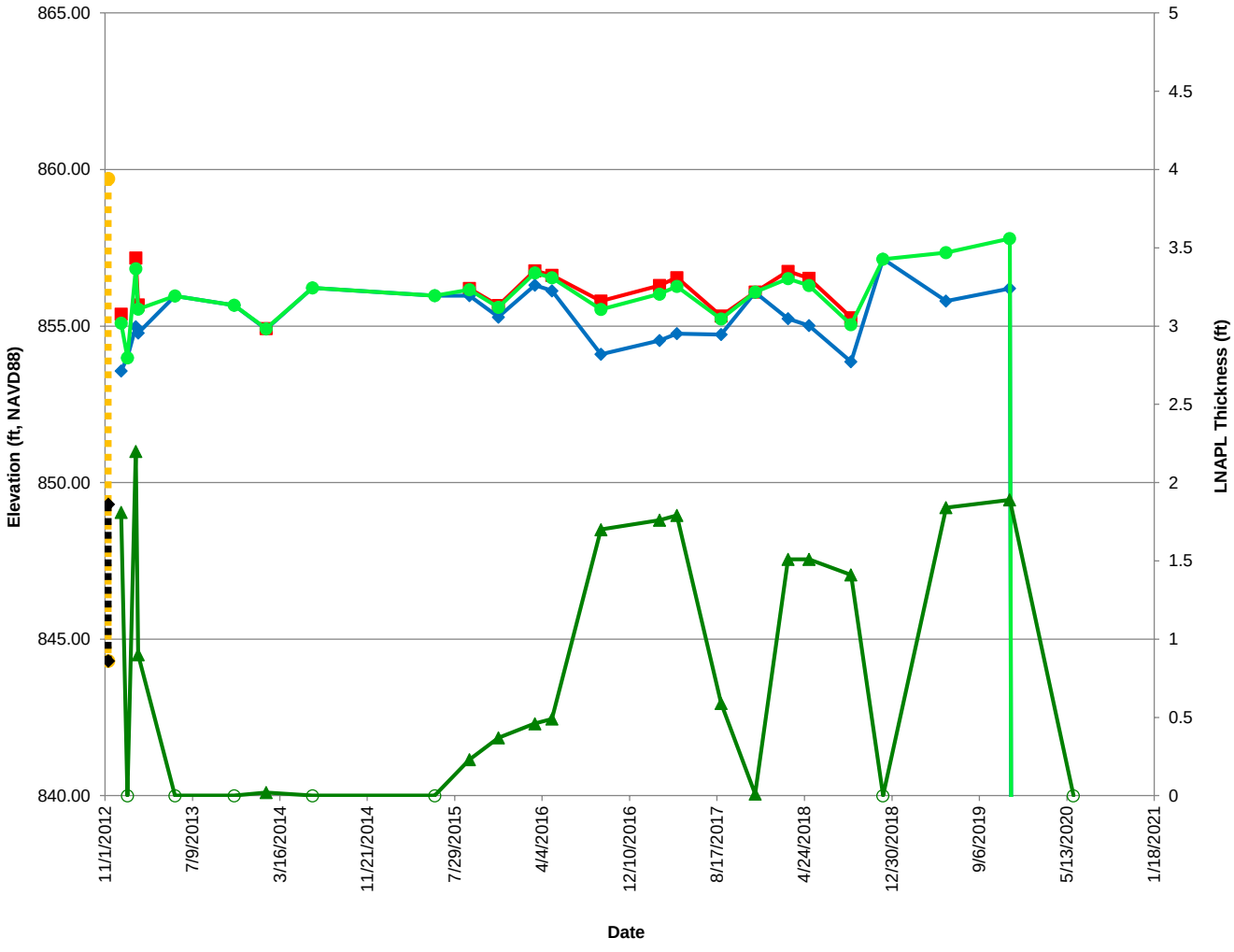


RACER Lansing
Lansing, MI

UNK-14 LNAPL HYDROGRAPH

ARCADIS Design & Consultancy for natural and built assets

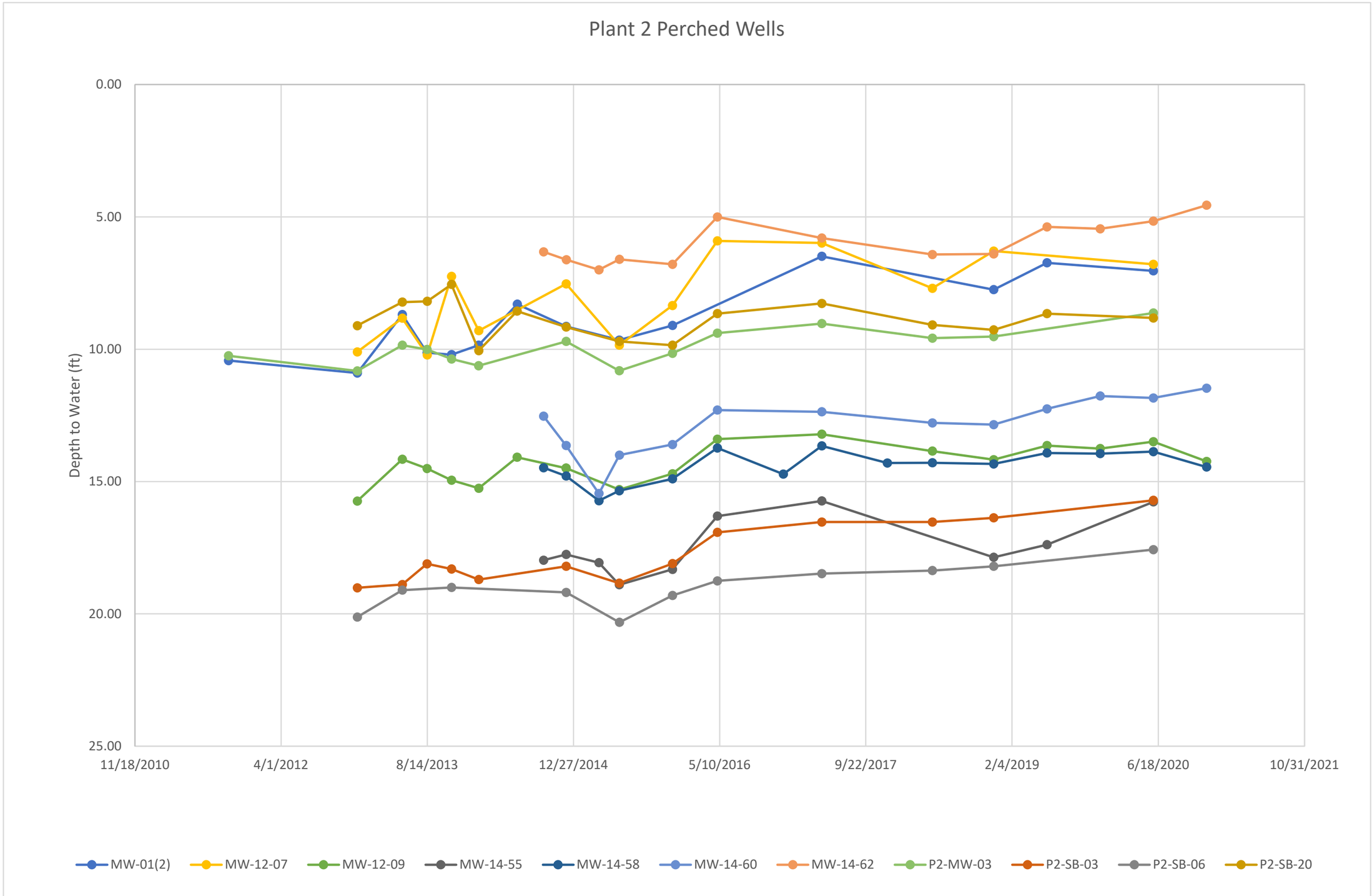
FIGURE

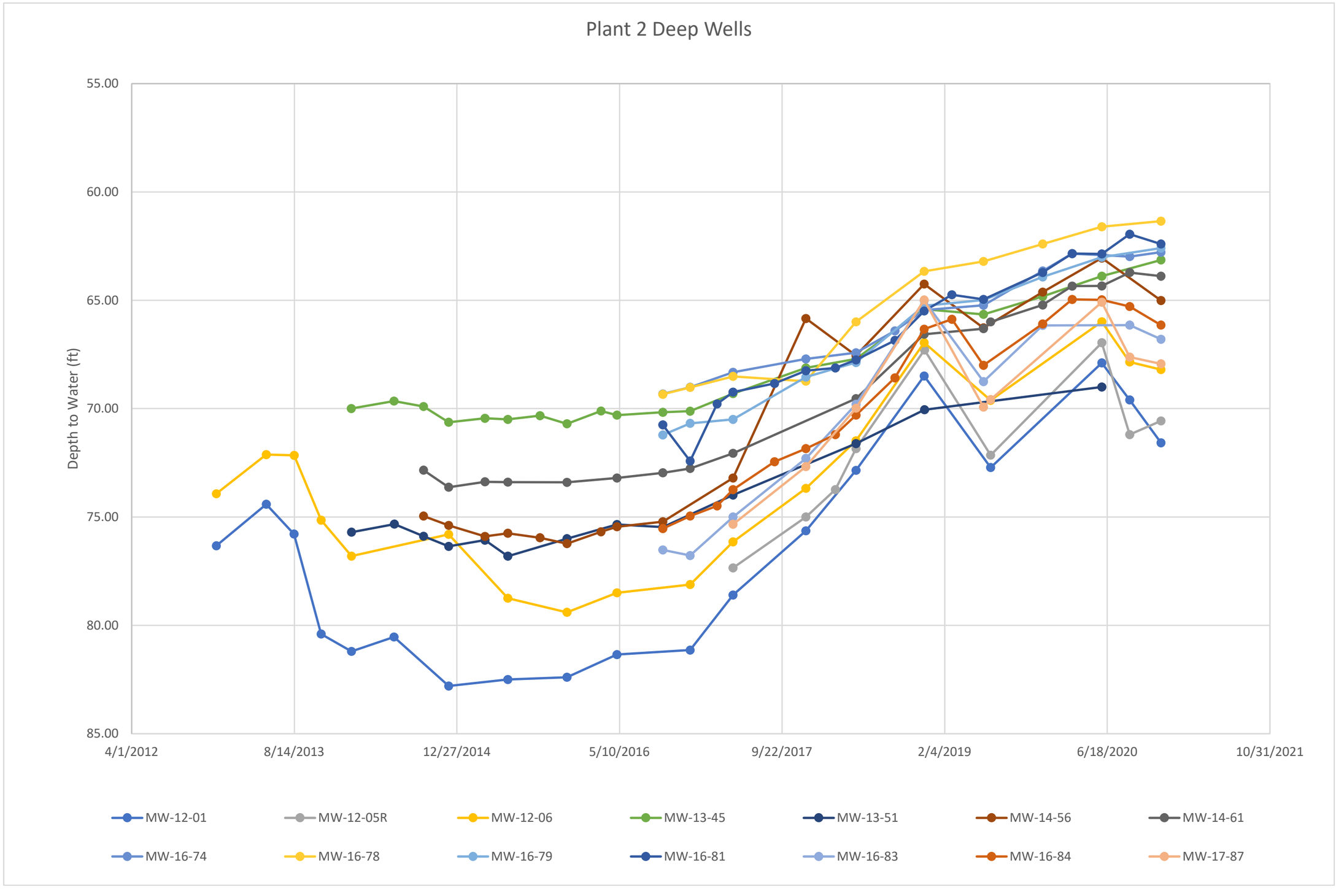
A

Appendix E

Groundwater Elevation Trend Graphs

(on attached CD)


Plant 2 Perched Wells
0.00
5.00
10.00
15.00
20.00
25.00
Depth to Water (ft)
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
2/4/2019
6/18/2020
10/31/2021
MW-01(2)
MW-12-07
MW-12-09
MW-14-55
MW-14-58
MW-14-60
MW-14-62
P2-MW-03
P2-SB-03
P2-SB-06
P2-SB-20


Plant 2 Deep Wells
Depth to Water (ft)
55.00
60.00
65.00
70.00
75.00
80.00
85.00
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
2/4/2019
6/18/2020
10/31/2021
MW-12-01
MW-12-05R
MW-12-06
MW-13-45
MW-13-51
MW-14-56
MW-14-61
MW-16-74
MW-16-78
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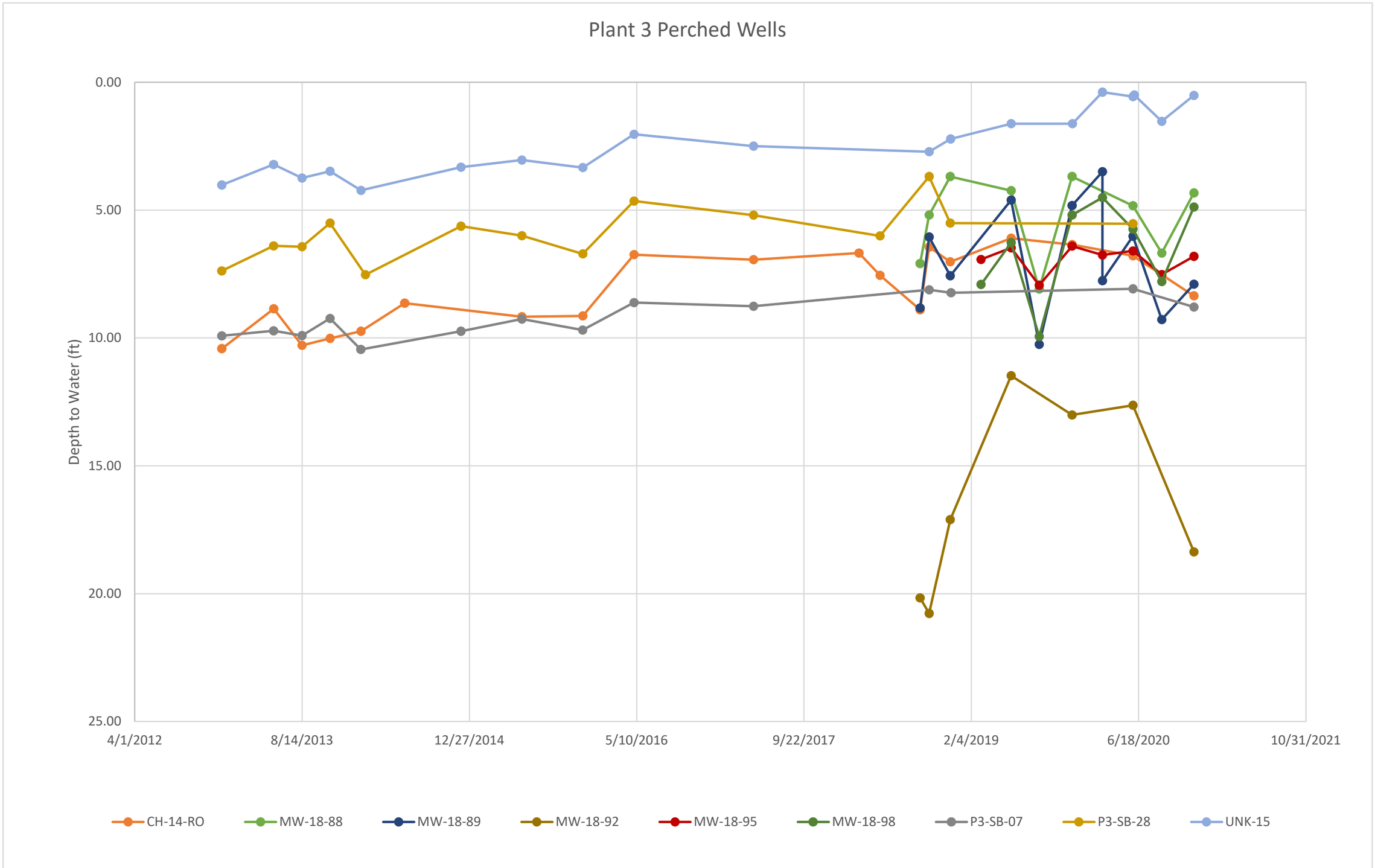
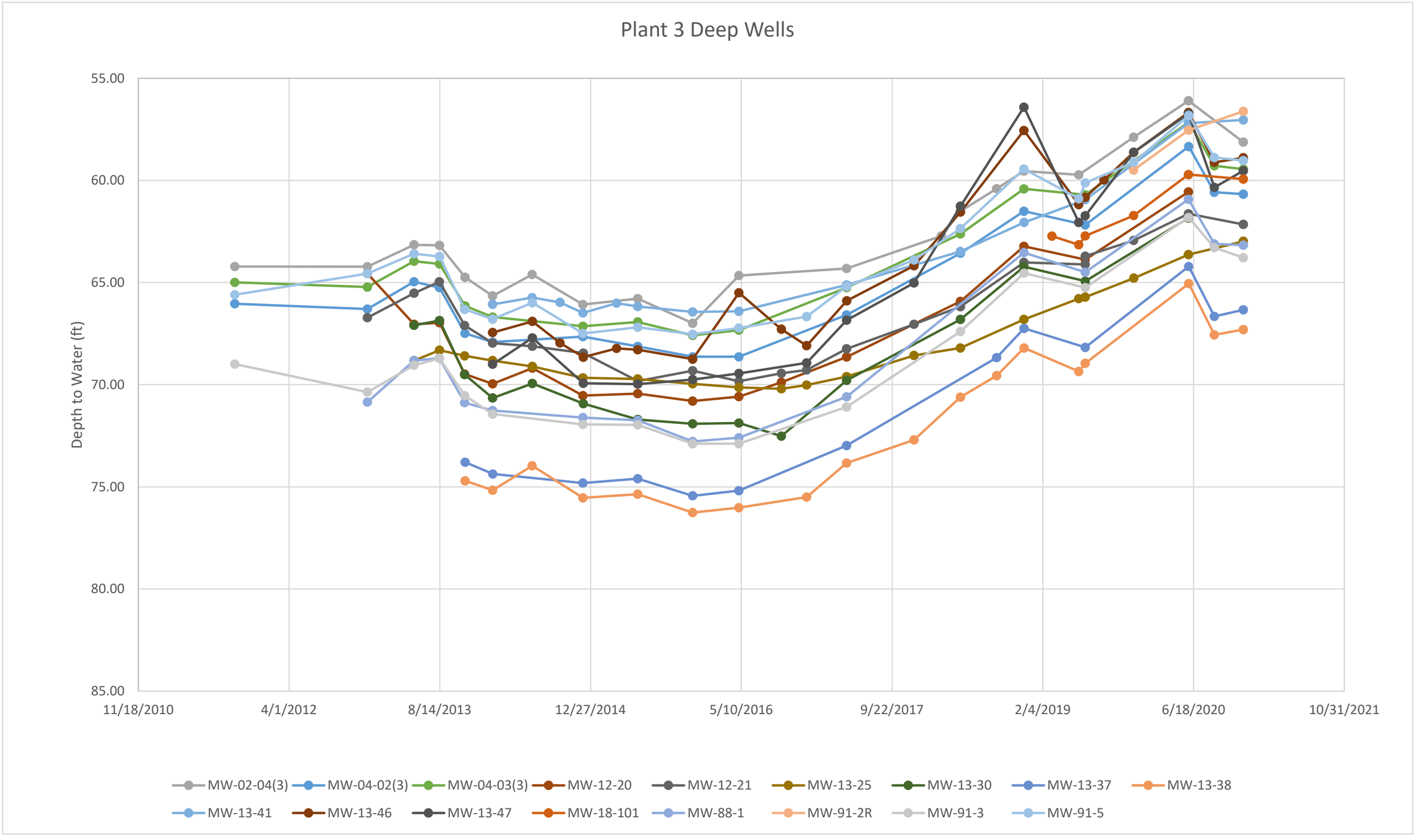
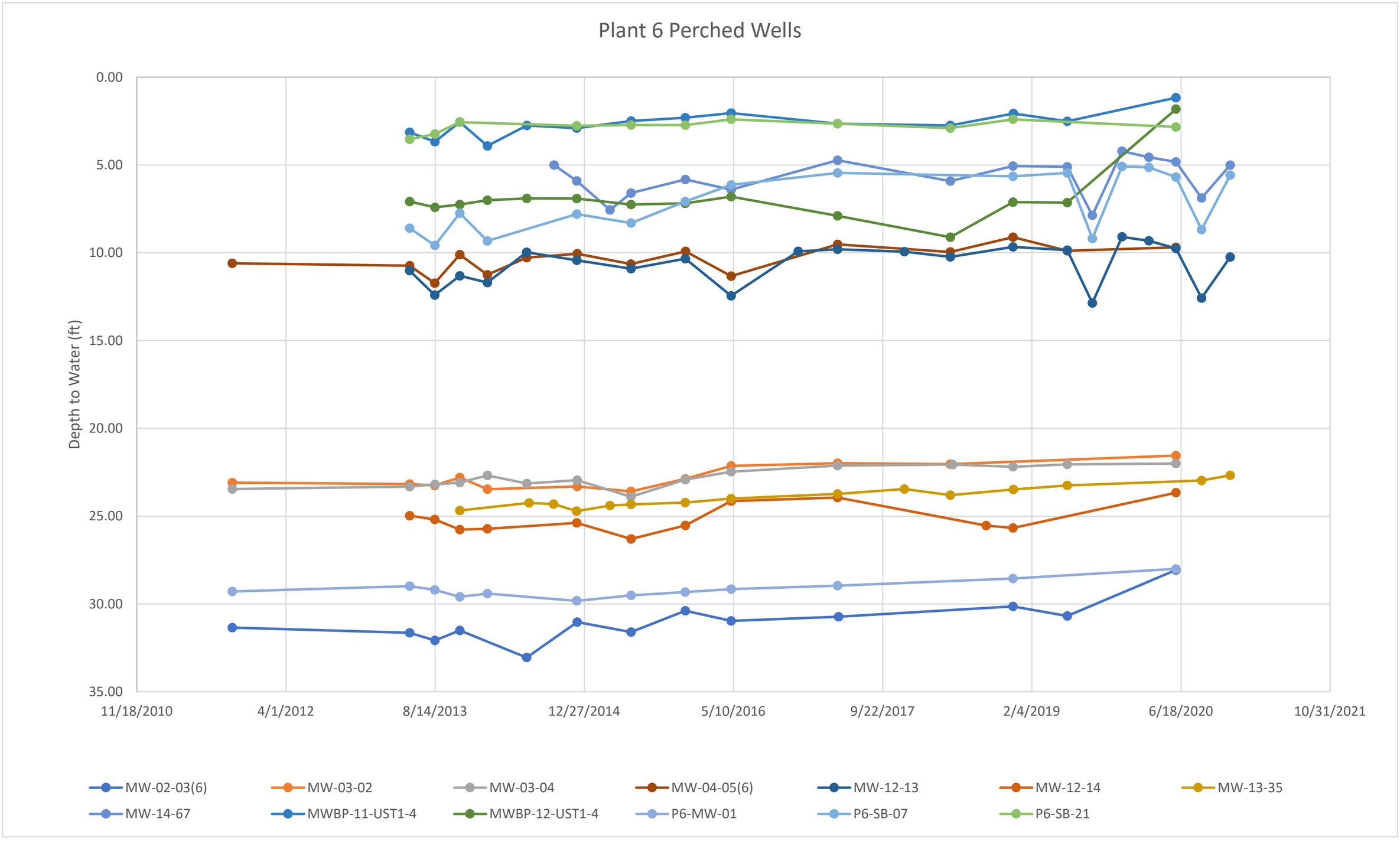
MW-16-84
MW-17-87


Plant 3 Perched Wells
0.00
5.00
10.00
15.00
20.00
25.00
Depth to Water (ft)
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
2/4/2019
6/18/2020
10/31/2021
CH-14-RO
MW-18-88
MW-18-89
MW-18-92
MW-18-95
MW-18-98
P3-SB-07
P3-SB-28
UNK-15


Plant 3 Deep Wells
Depth to Water (ft)
55.00
60.00
65.00
70.00
75.00
80.00
85.00
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
2/4/2019
6/18/2020
10/31/2021
MW-02-04(3)
MW-04-02(3)
MW-04-03(3)
MW-12-20
MW-12-21
MW-13-25
MW-13-30
MW-13-37
MW-13-38
MW-13-41
MW-13-46
MW-13-47
MW-18-101
MW-88-1
MW-91-2R
MW-91-3
MW-91-5


Plant 6 Perched Wells
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Depth to Water (ft)
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
2/4/2019
6/18/2020
10/31/2021
MW-02-03(6)
MW-03-02
MW-03-04
MW-04-05(6)
MW-12-13
MW-12-14
MW-13-35
MW-14-67
MWBP-11-UST1-4
MWBP-12-UST1-4
P6-MW-01
P6-SB-07
P6-SB-21

Appendix F

Concentration vs. Time Plots

(on attached CD)

Appendix F: Stability Analysis

Trend Analysis Methodology

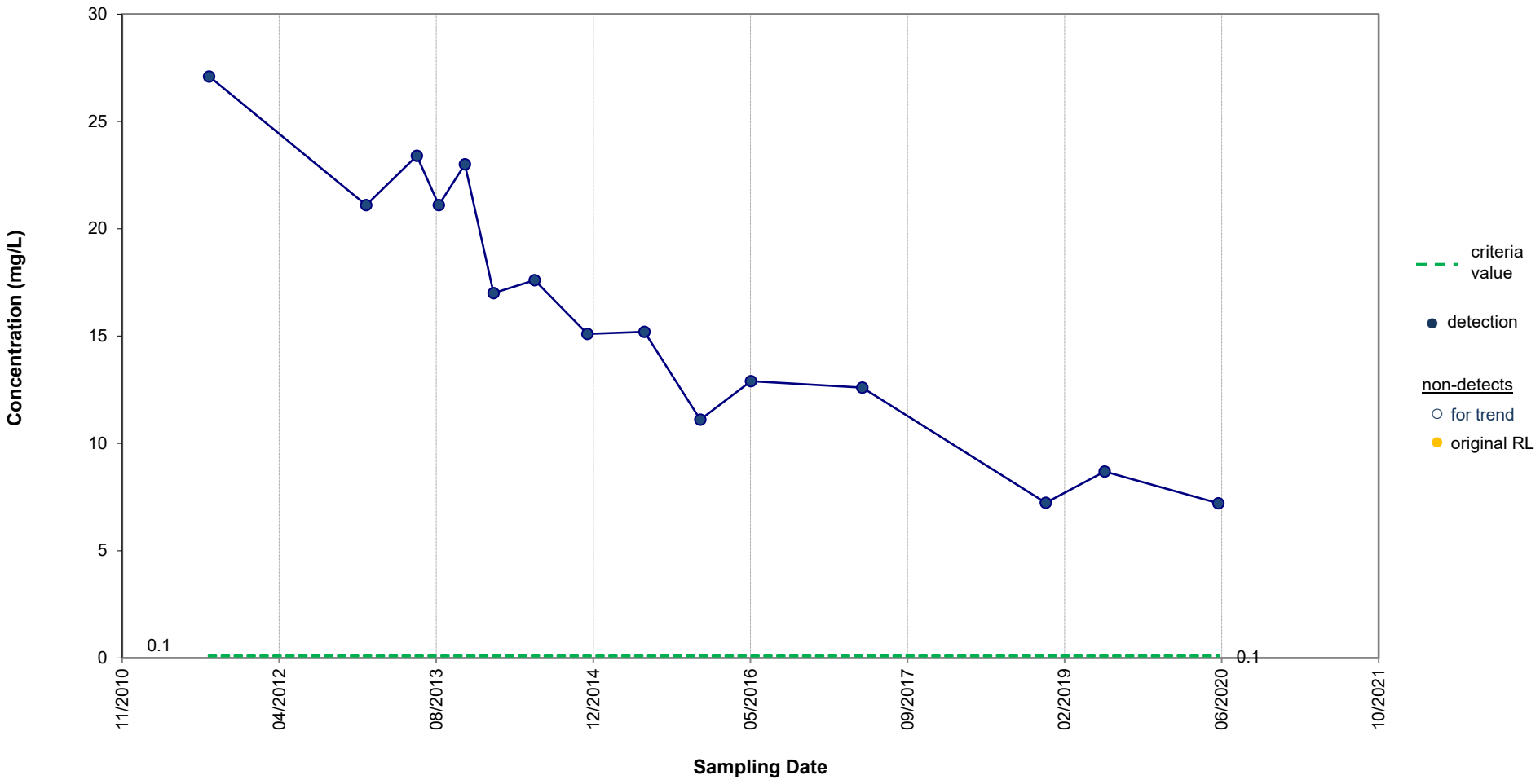
The Mann-Kendall trend test is a non-parametric test that determines trends based on ranked data. As such, it is relatively insensitive to small data sets, outlier values and non-detect concentrations and does not require the data to fit a specific model. The basic Mann-Kendall trend test is performed by listing the concentrations of the constituent of interest in temporal order and computing the differences between a given measurement and earlier measurements (Gilbert 1987; USEPA 2009). Based on USEPA guidance (USEPA 2009), non-detect values are set to a single value less than that of any detections, and laboratory qualified concentrations are set equal to the laboratory reporting limit.

The Mann-Kendall test statistic (sum of trend [S]) is the difference between the number of strictly positive differences and the number of strictly negative differences. If S is positive, an increasing trend is indicated; if S is negative, a decreasing trend is indicated; and if S is near zero, no trend is apparent. Trends with positive or negative S-statistics were accepted as statistically significant for p-values less than or equal to 0.1 (90% confidence level). The coefficient of variation (CV) is a quantitative measure that can be used to evaluate if concentrations are stable in cases where a statistically significant trend is not apparent. The CV is calculated as the standard deviation of concentrations of each COC measured over time at a monitoring well divided by the mean (average) concentration over the same time period. CV values near or greater than 1 indicate variability in concentrations over time or suggest an underlying trend that is not statistically significant. Lower CV values indicate that concentrations are stable over time. Where no significant trend was found, the trend determination presented was based on the sign and magnitude of the S-statistic, the CV value, and visual examination of the pattern in concentrations over time.

References

Gilbert, R.O. 1987. *Statistical Methods for Environmental Pollution Monitoring*. John Wiley and Sons, Inc. New York.

USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Office of Resource Conservation and Recovery. Unified Guidance. EPA 530-R-09-007.



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

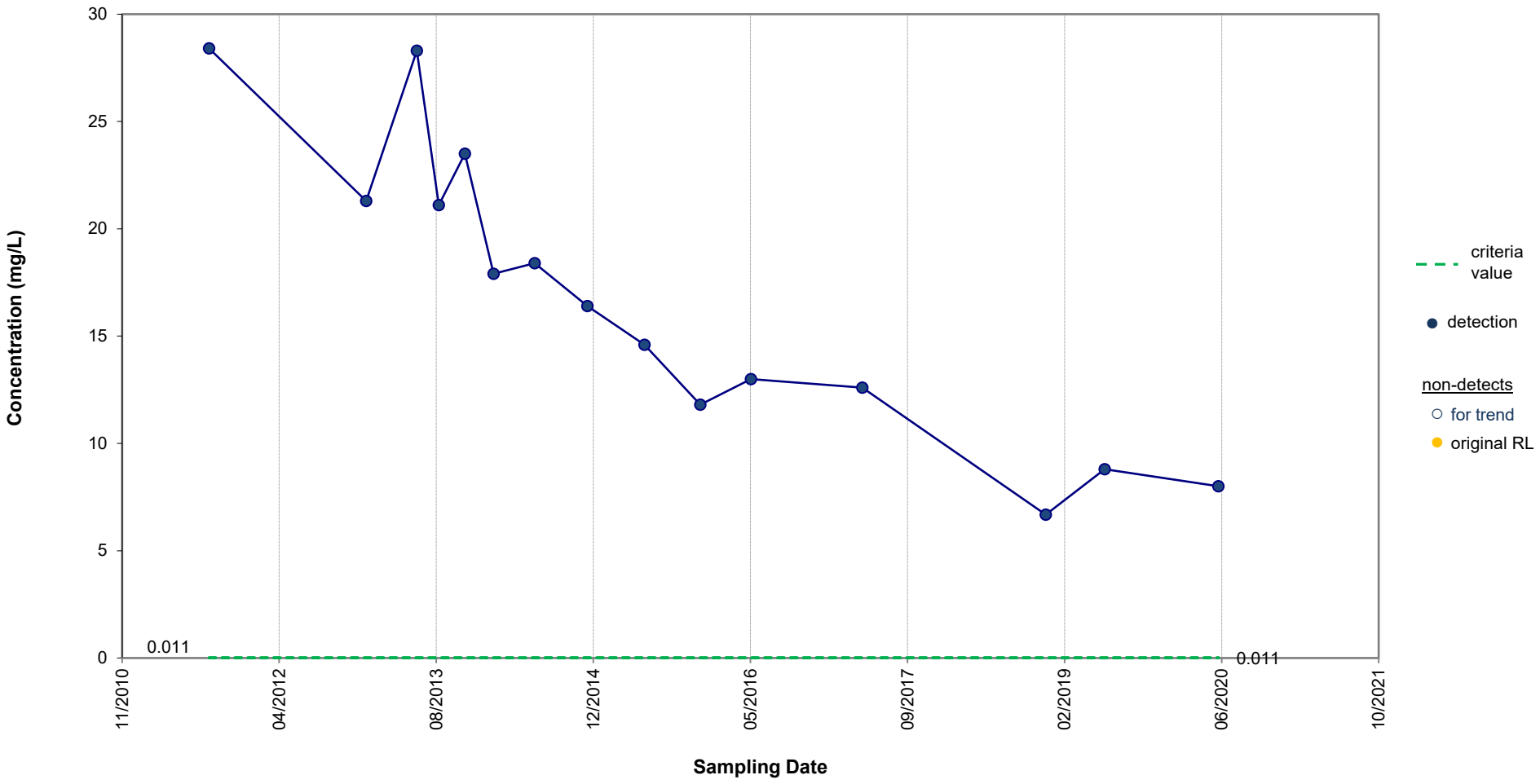
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: CH-14-RO, Chromium III

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

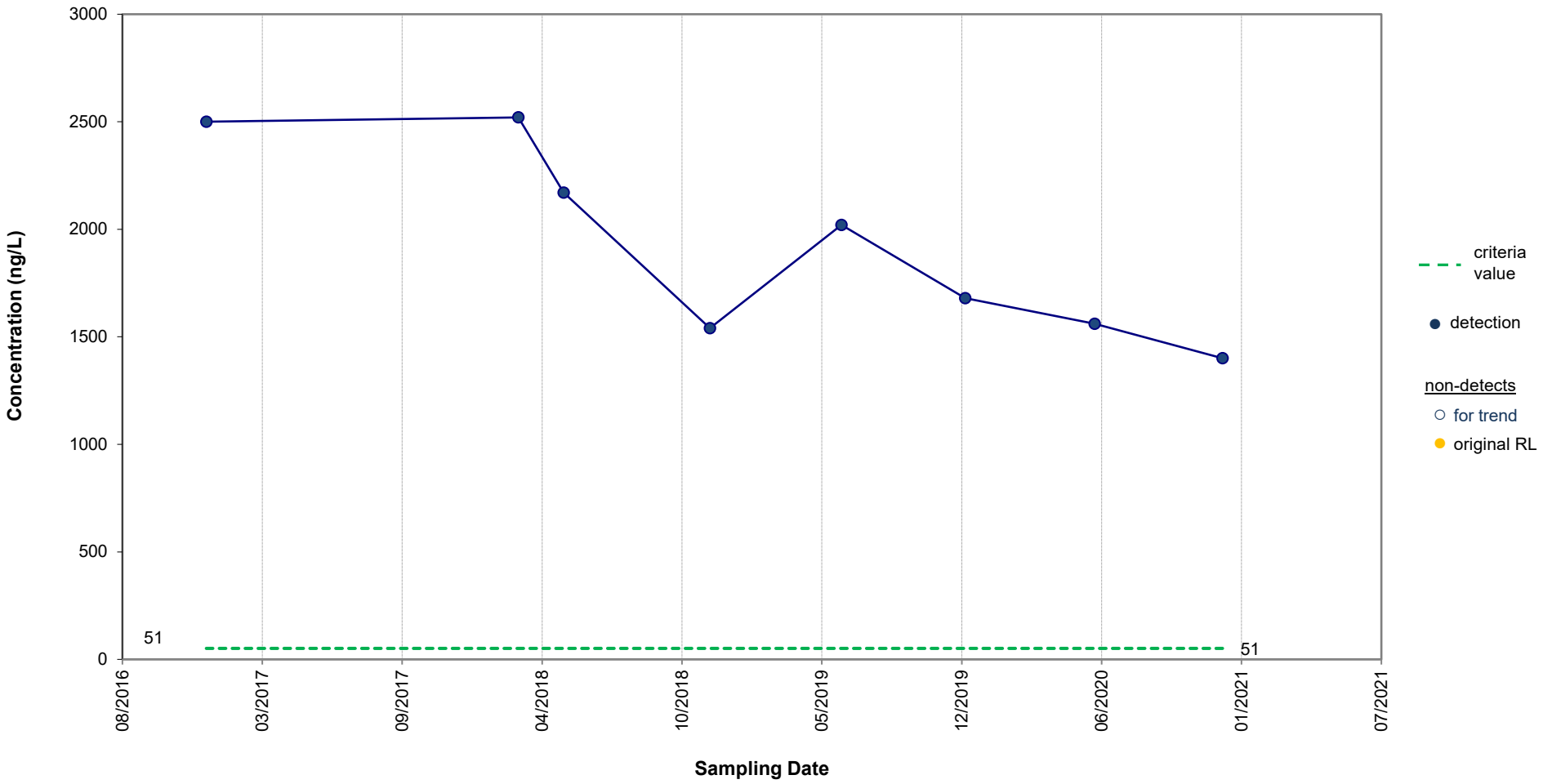
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: CH-14-RO, Chromium VI

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

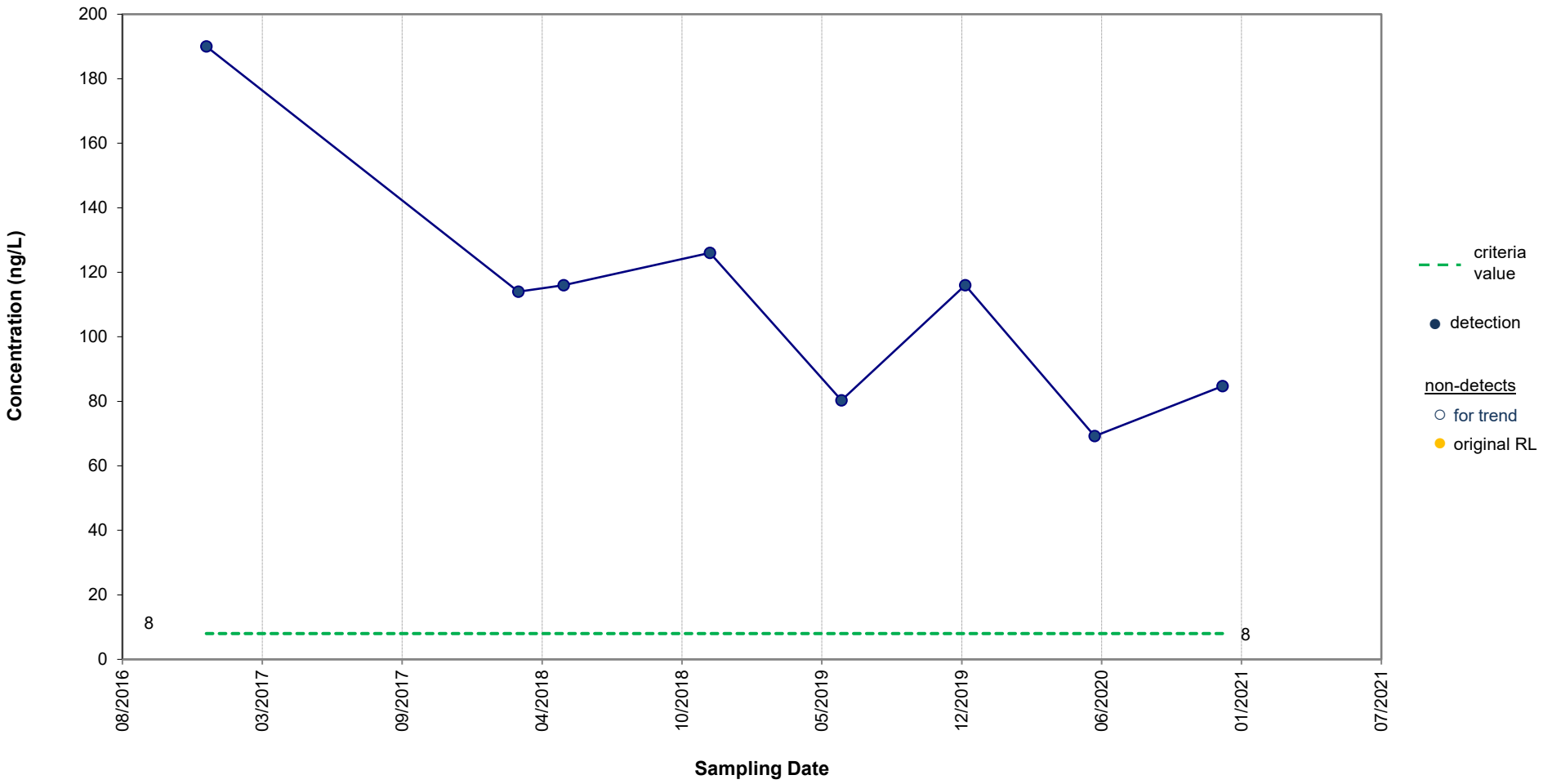
p value = 0.01 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: CH-14-RO, PFHxS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

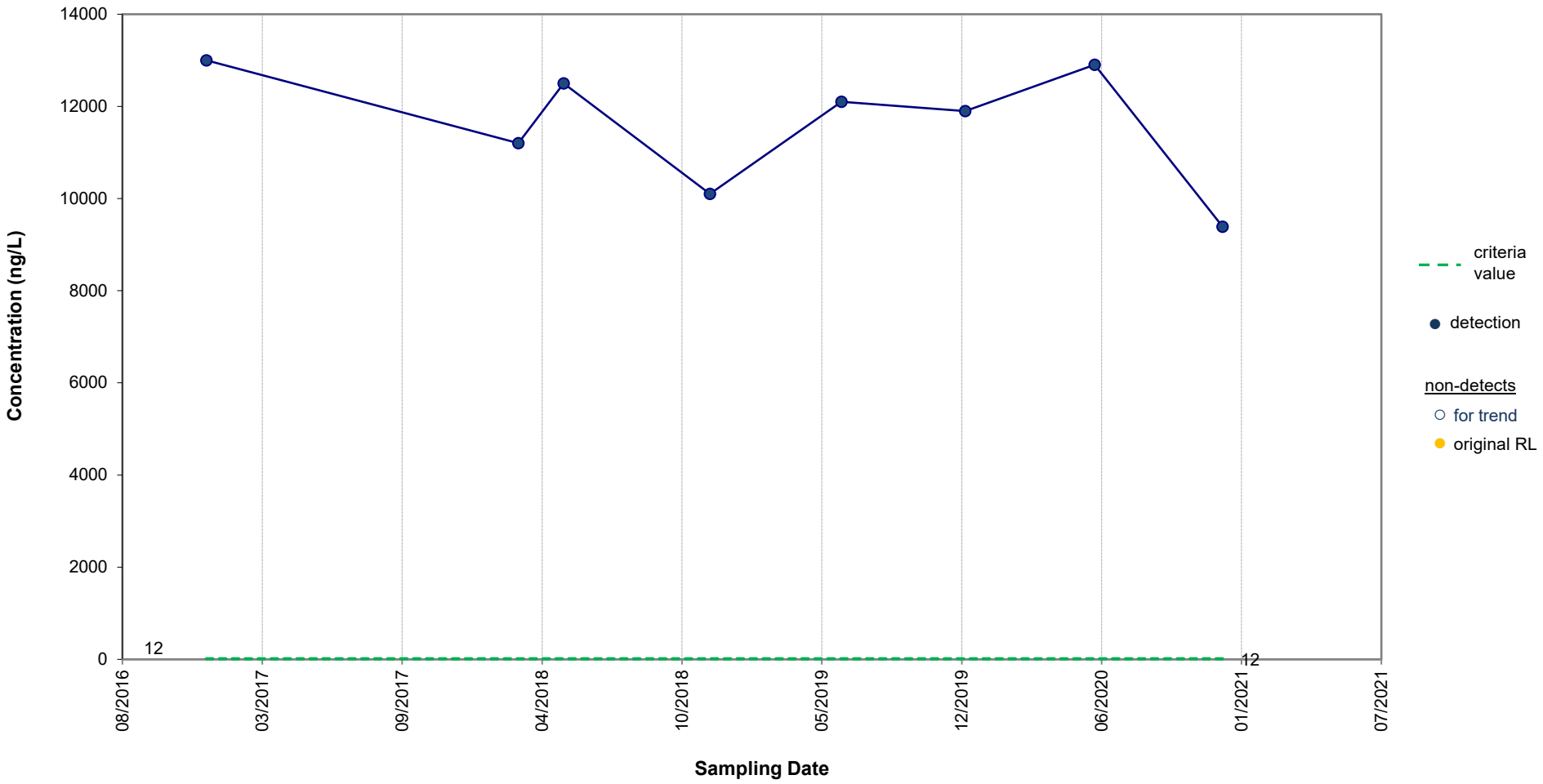
p value = 0.07 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: CH-14-RO, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

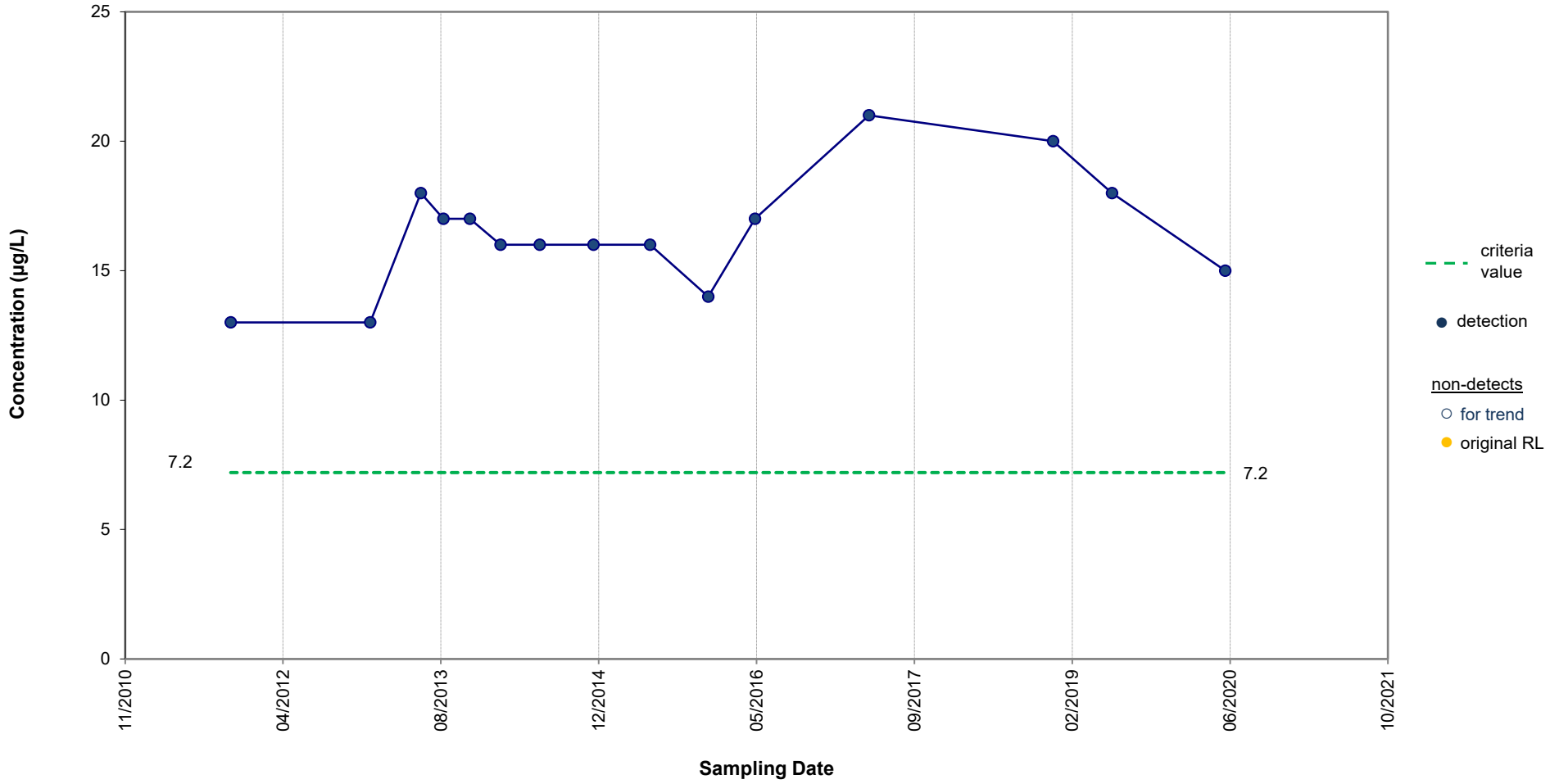
p value = 0.20 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: CH-14-RO, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

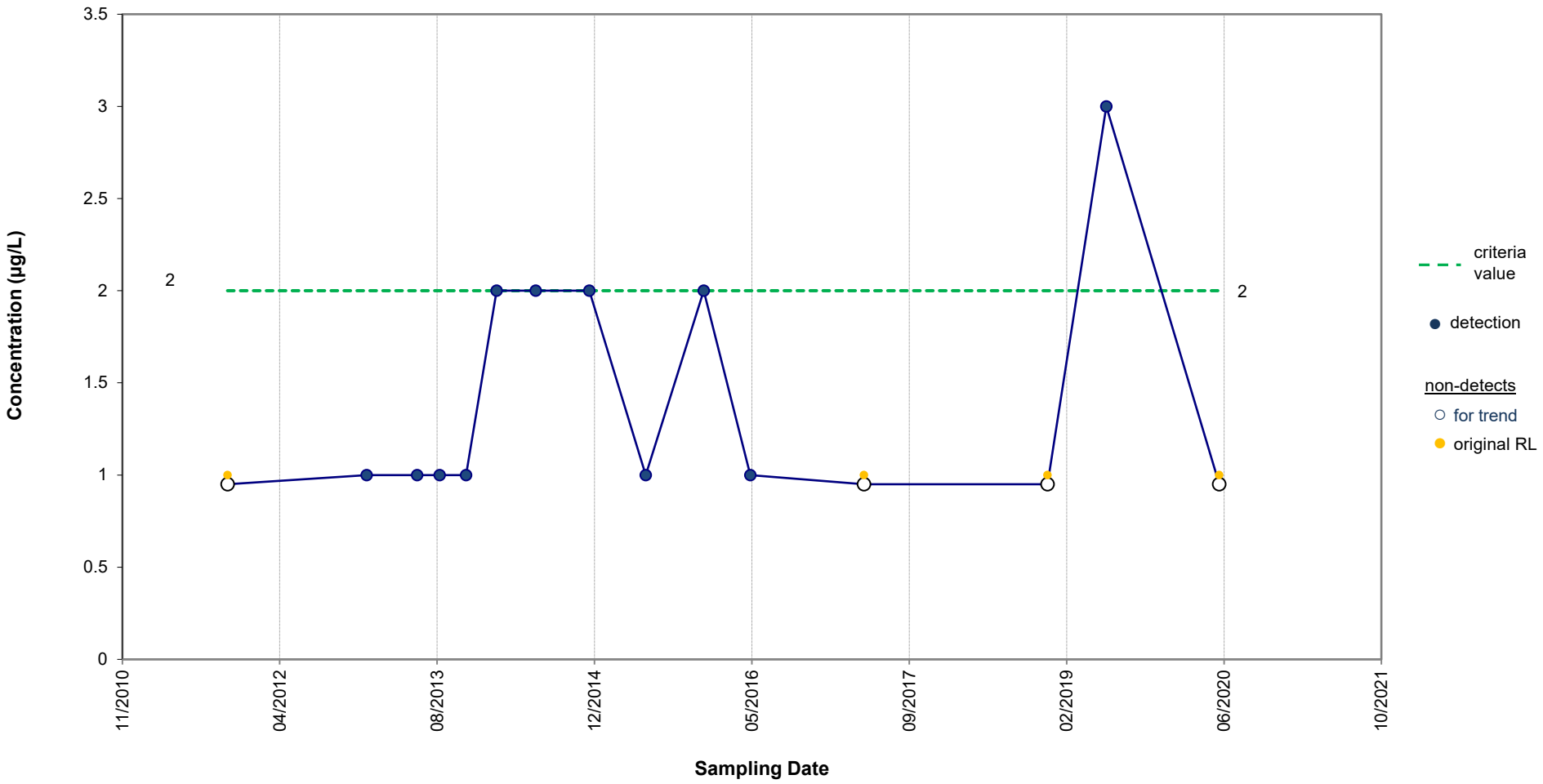
p value = 0.15 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-02-03(6), 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

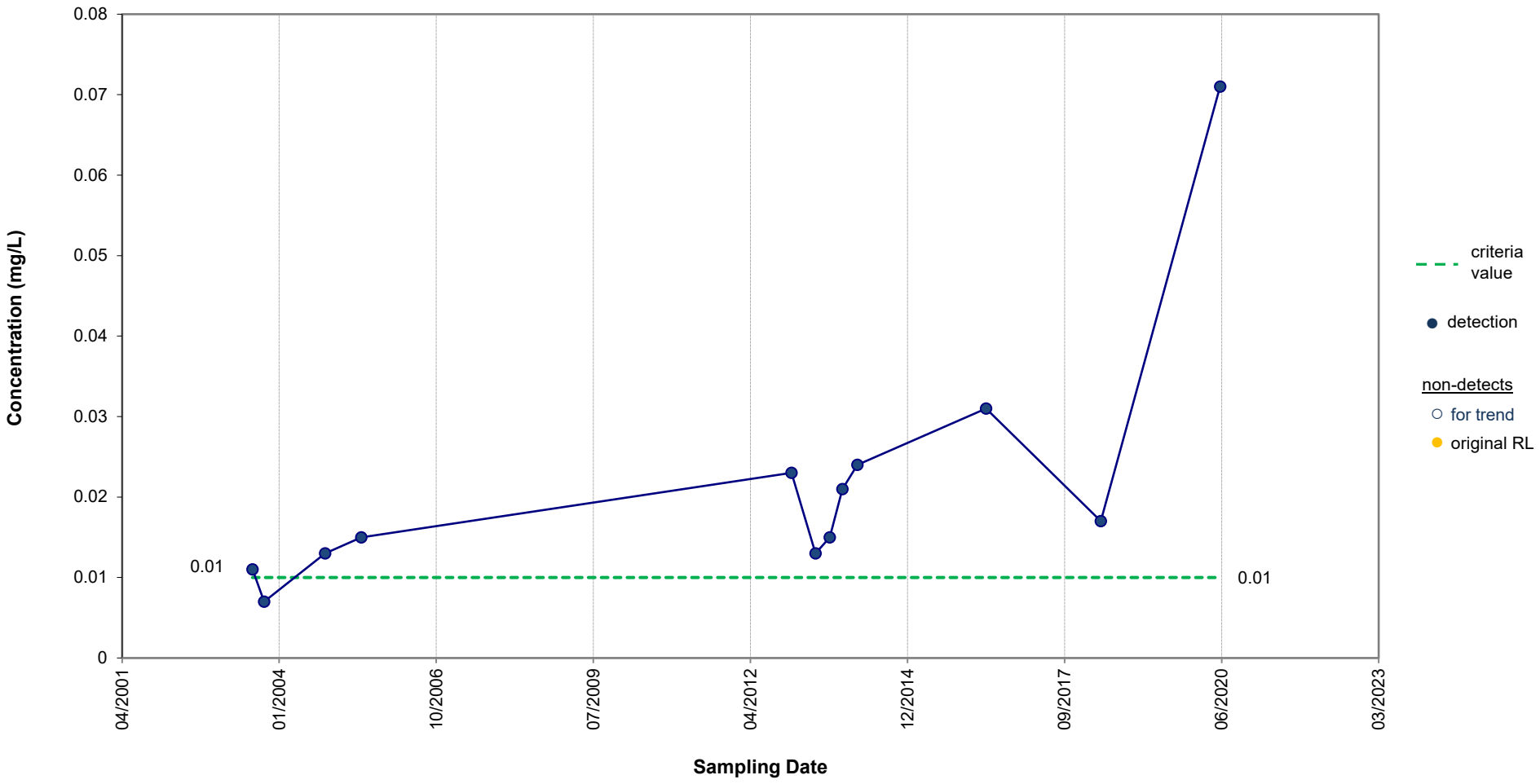
p value = 0.48 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-02-03(6), Vinyl Chloride

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

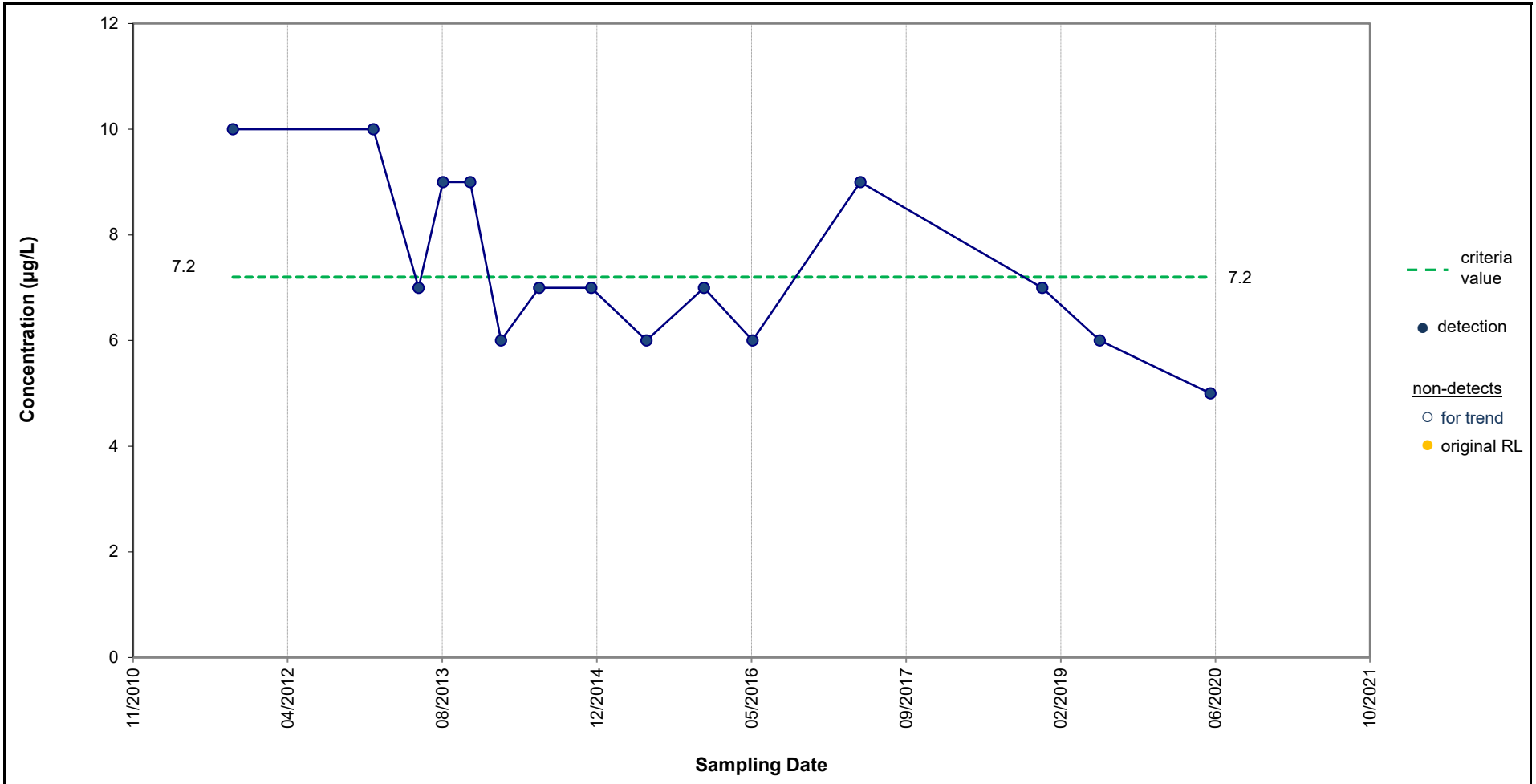
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-02-04(3), Arsenic

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

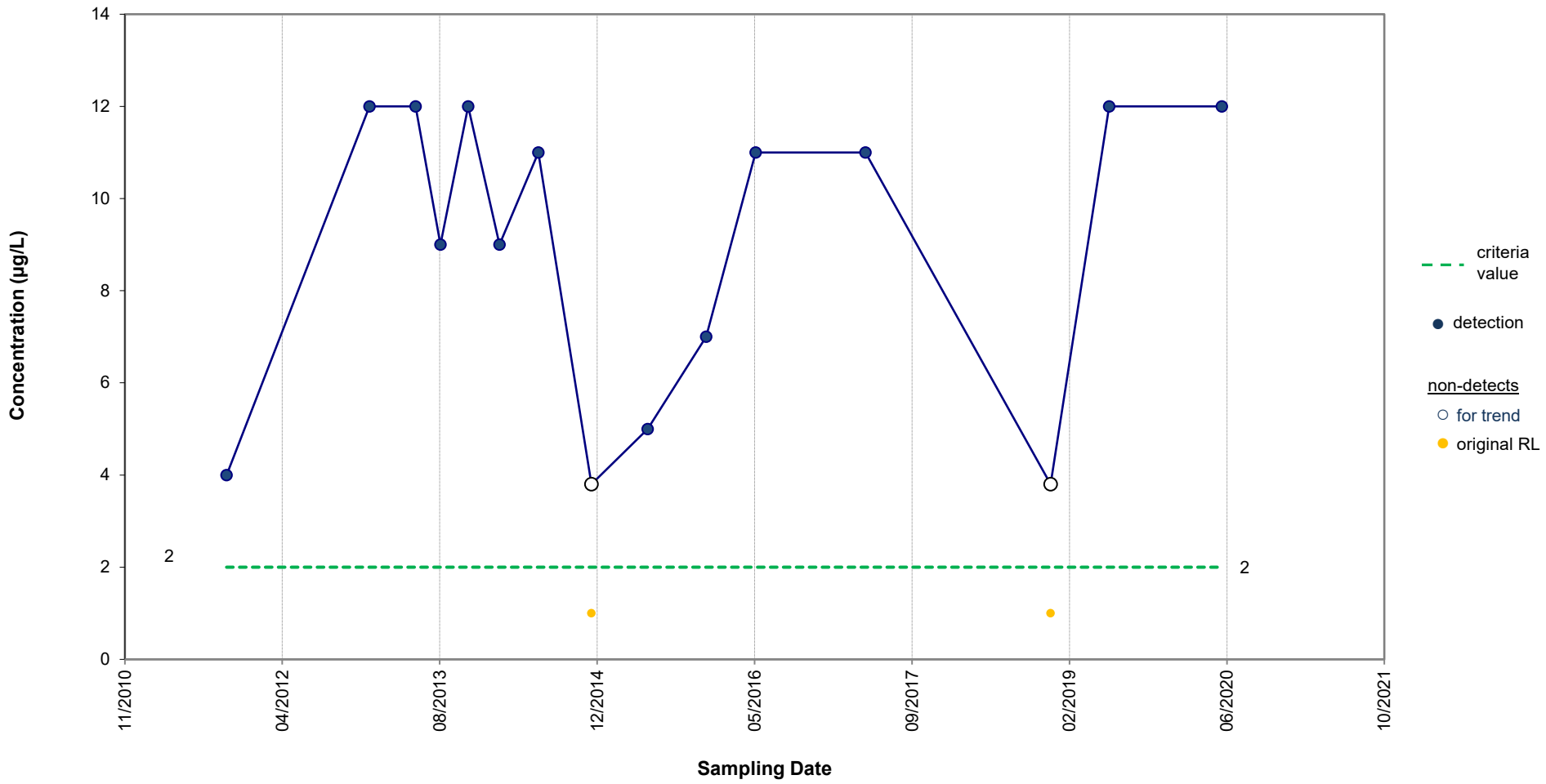
p value = 0.00 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-03-06, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

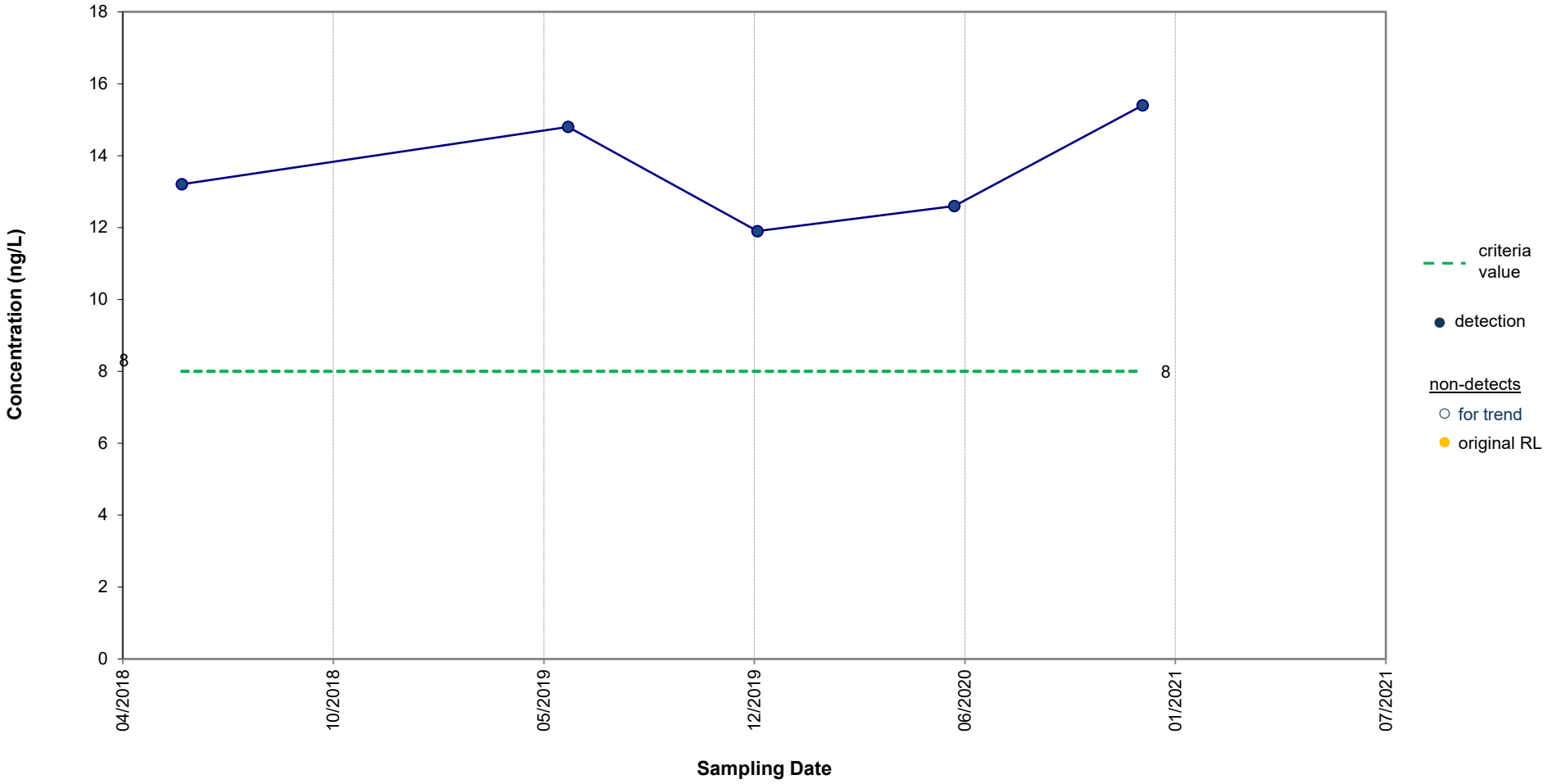
p value = 0.48 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-03-06, Vinyl Chloride

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

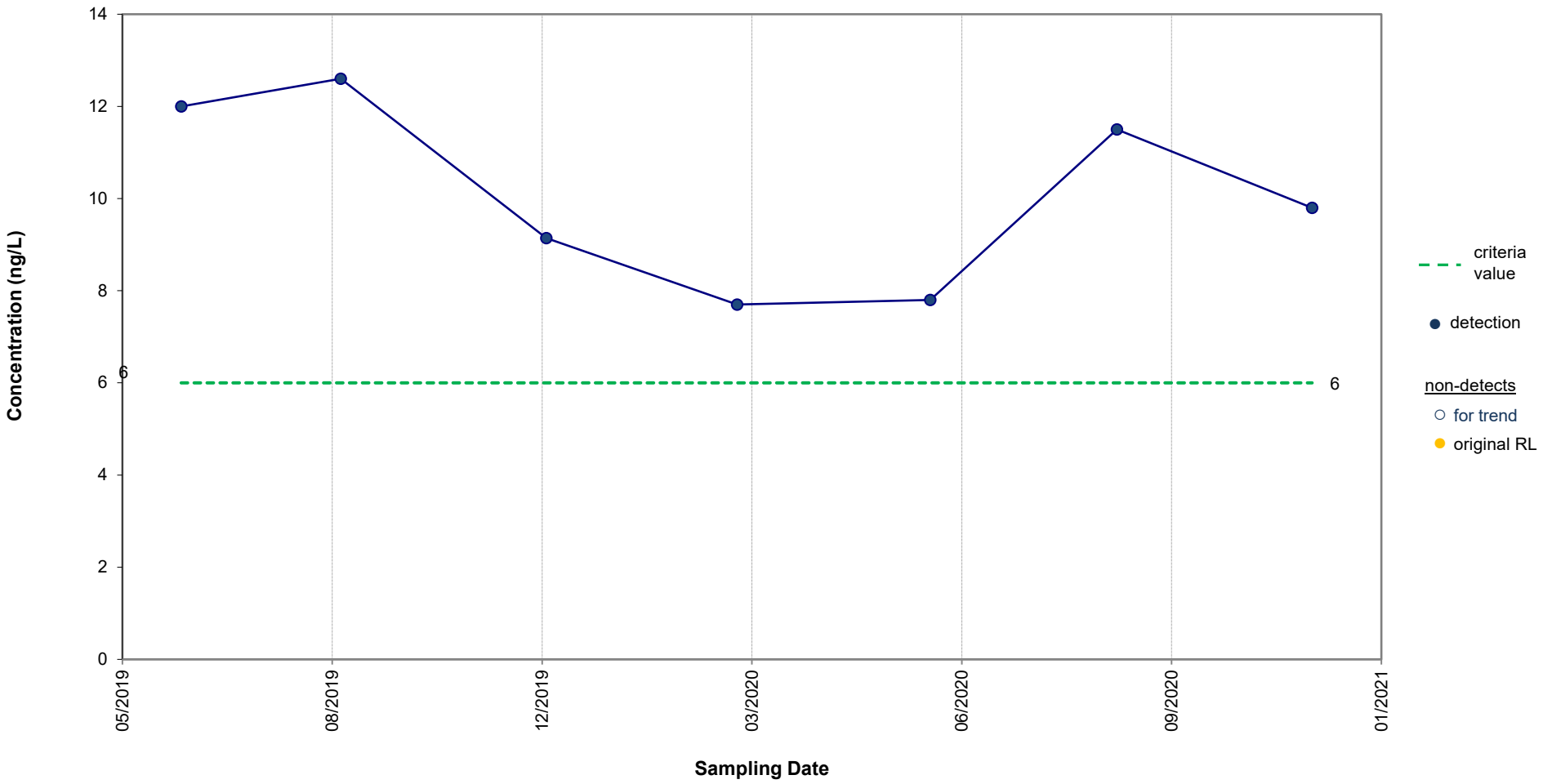
p value = 0.41 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-12-09, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

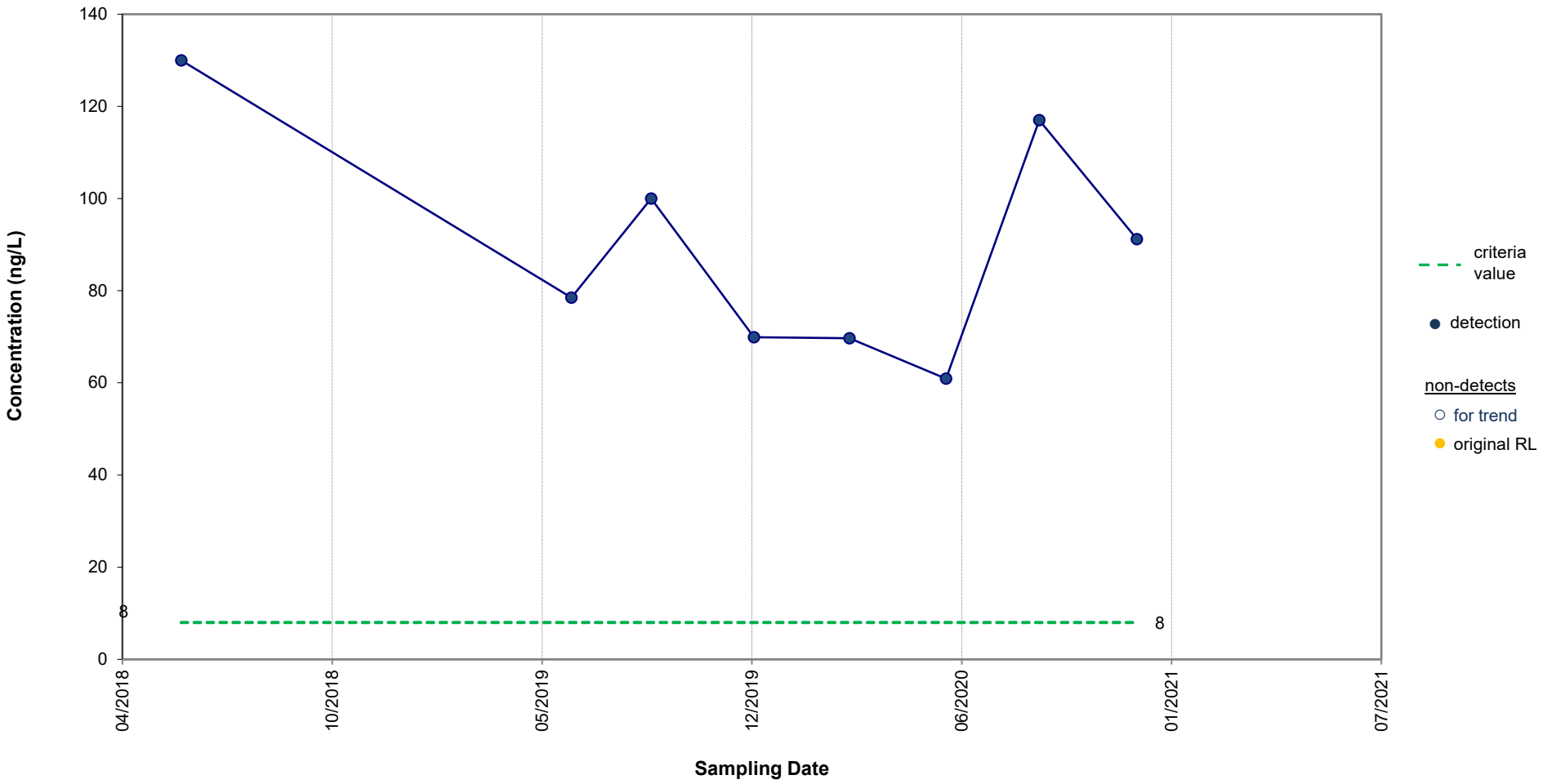
p value = 0.28 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-12-12, PFNA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

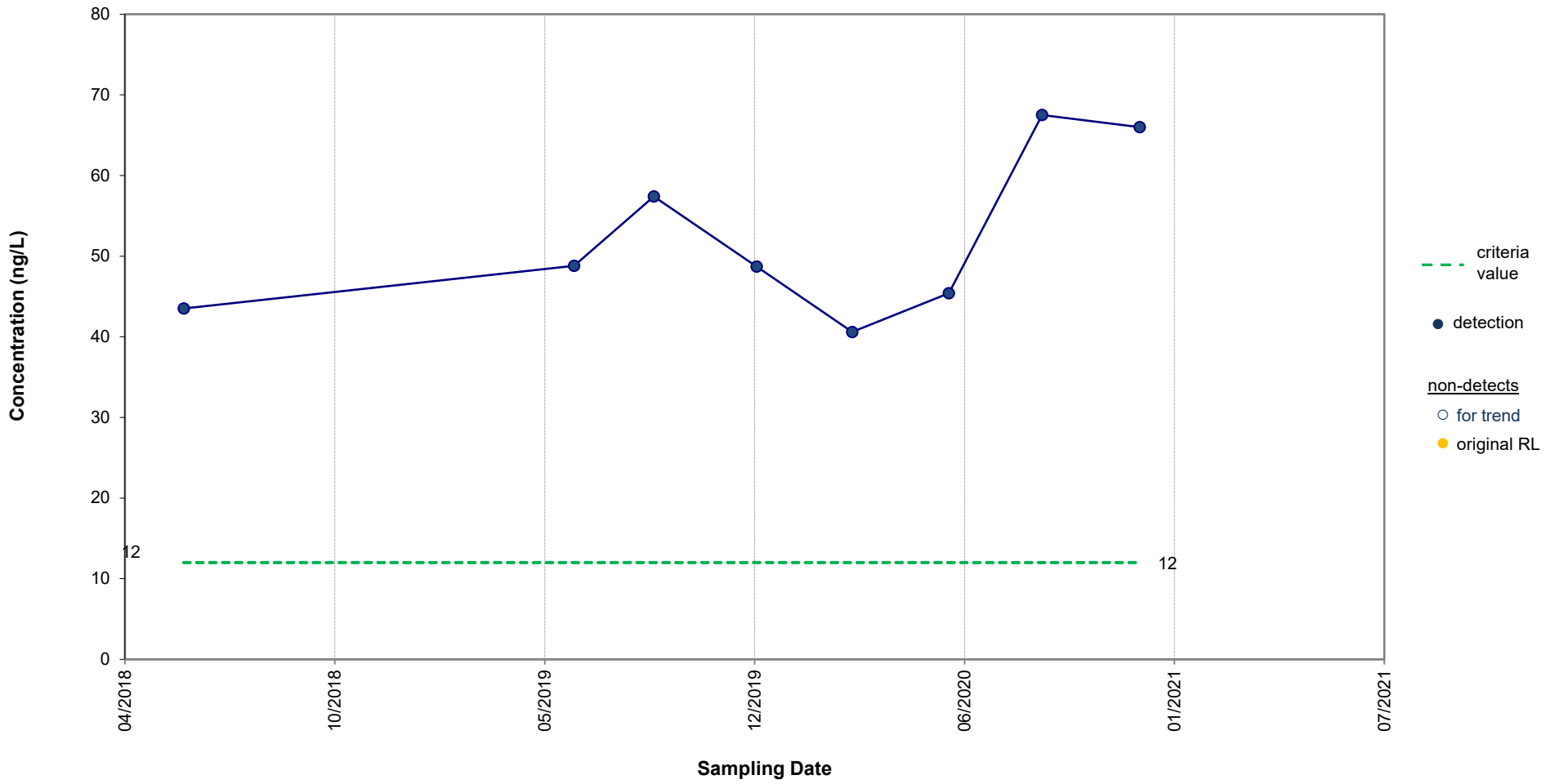
p value = 0.20 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-12-12, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

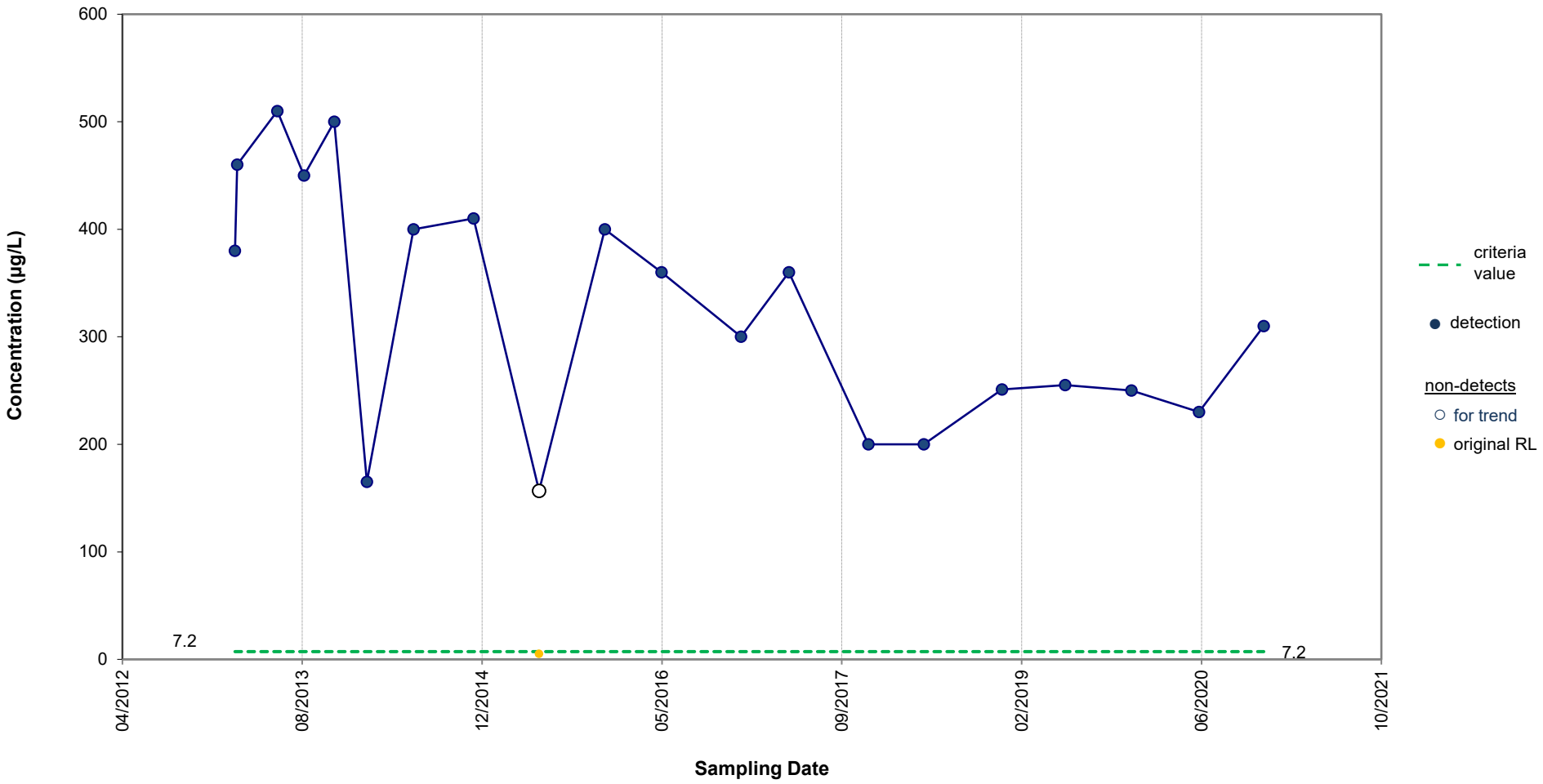
p value = 0.20 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-12-12, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

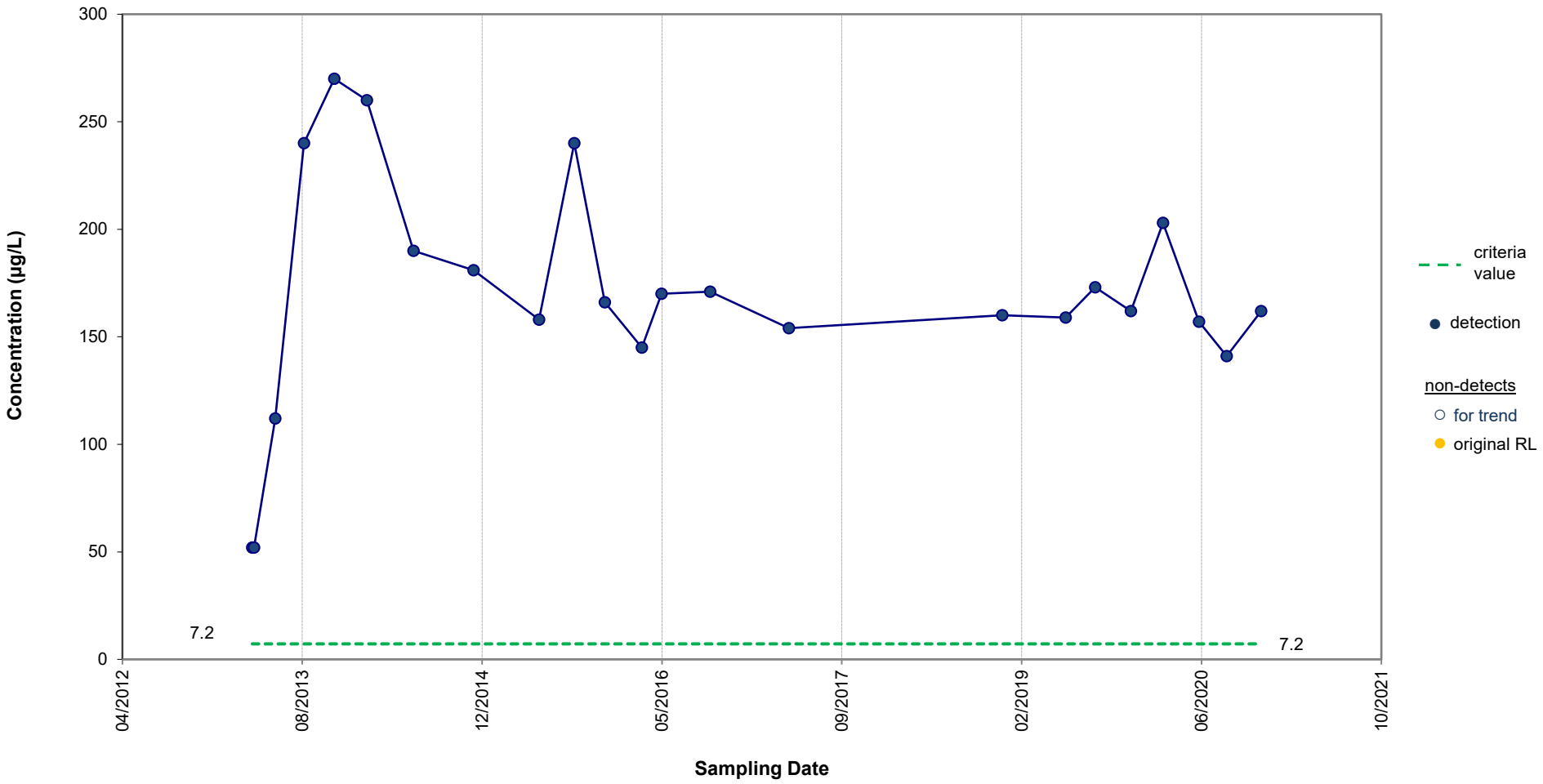
p value = 0.00 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-12-21, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

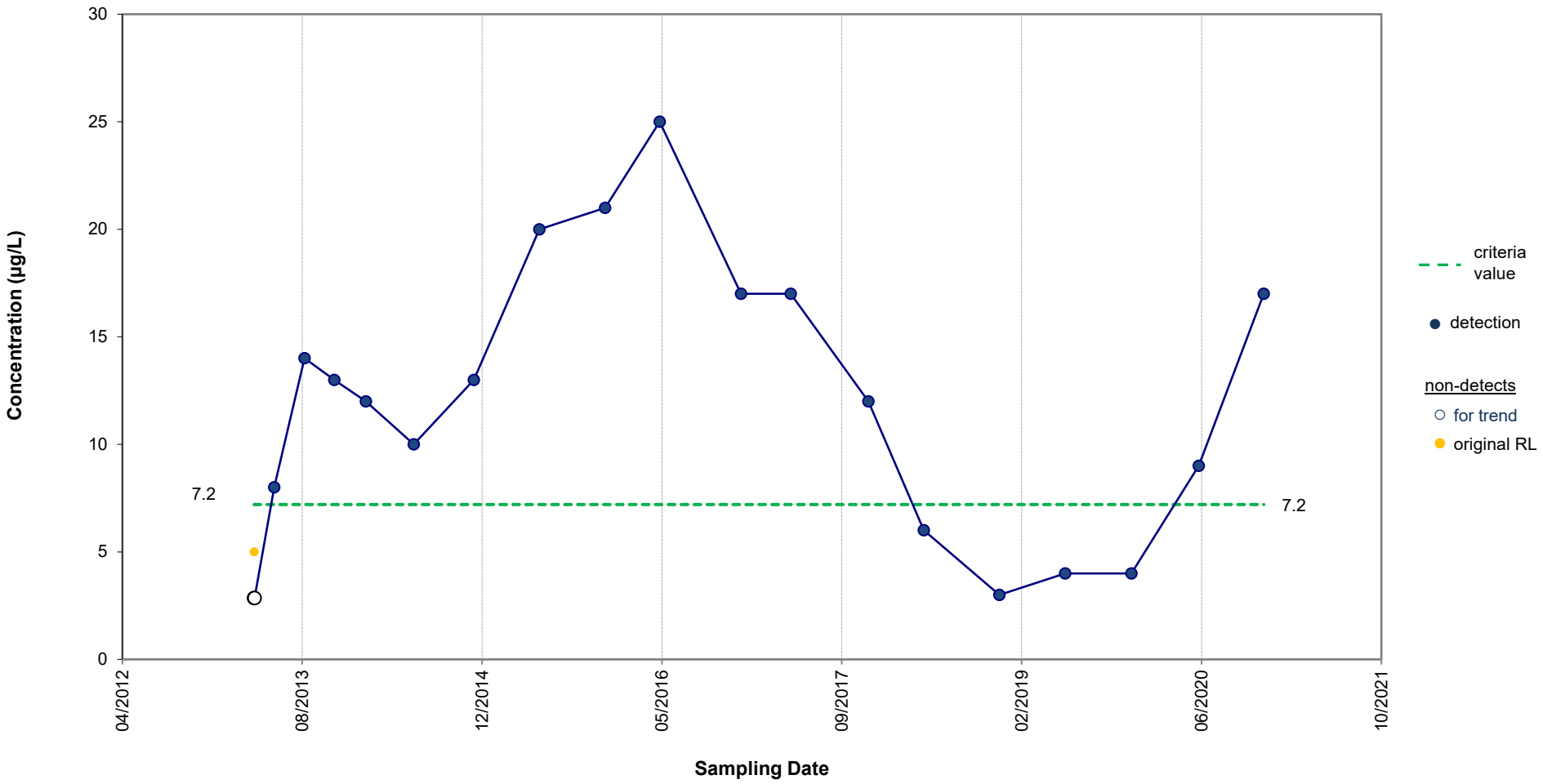
p value = 0.33 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-22, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

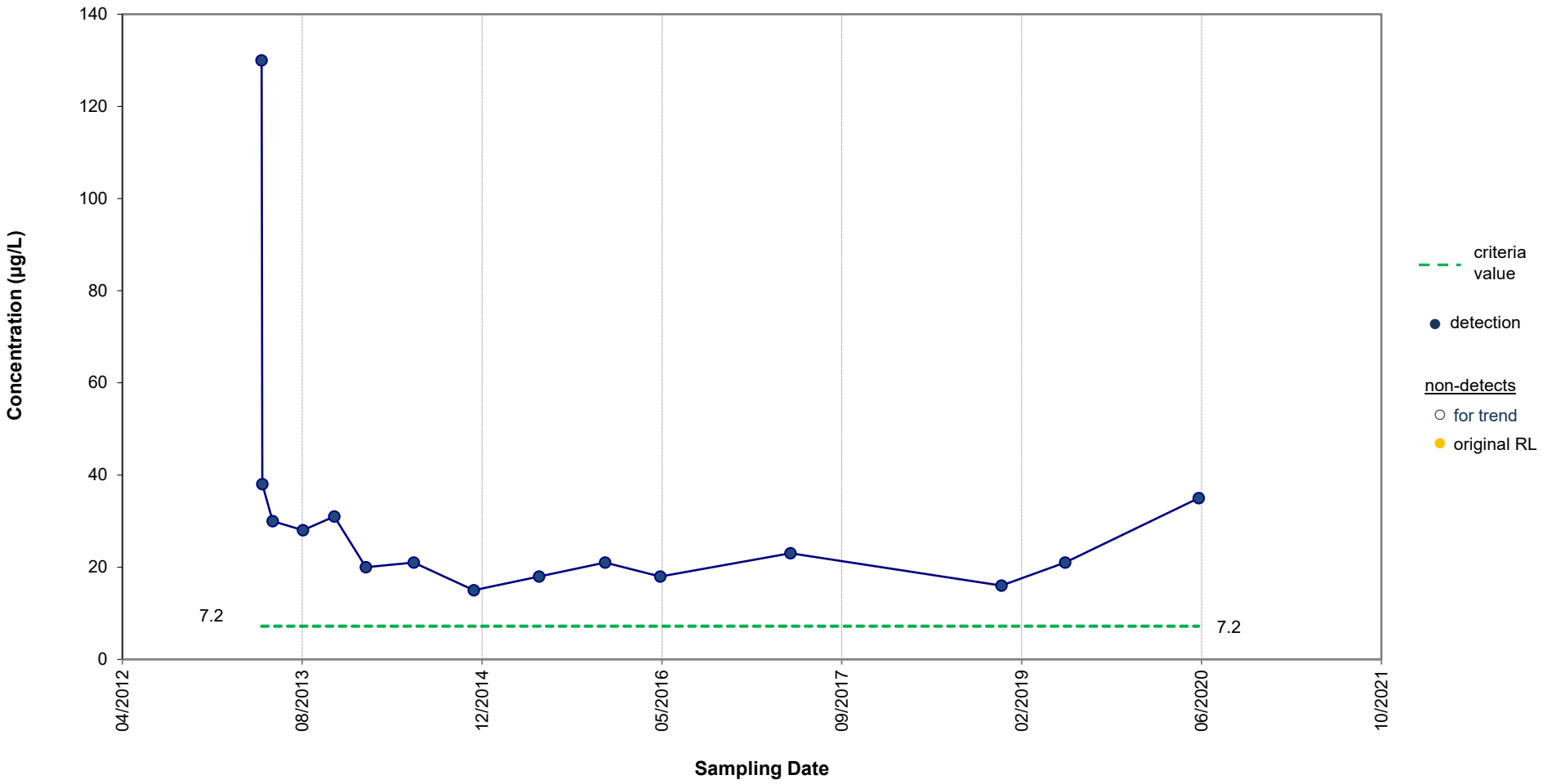
p value = 0.37 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-25, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

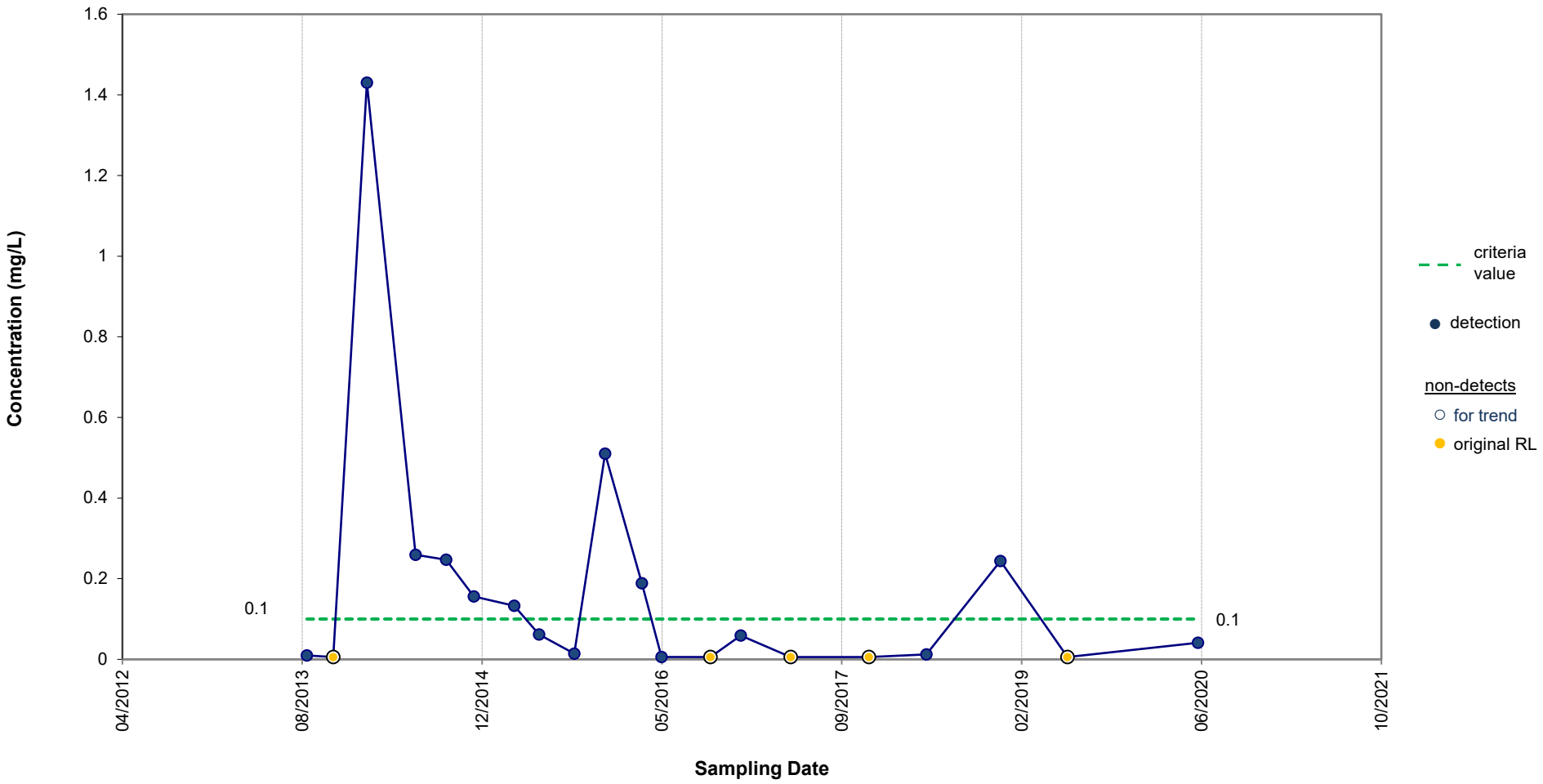
p value = 0.04 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-29, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

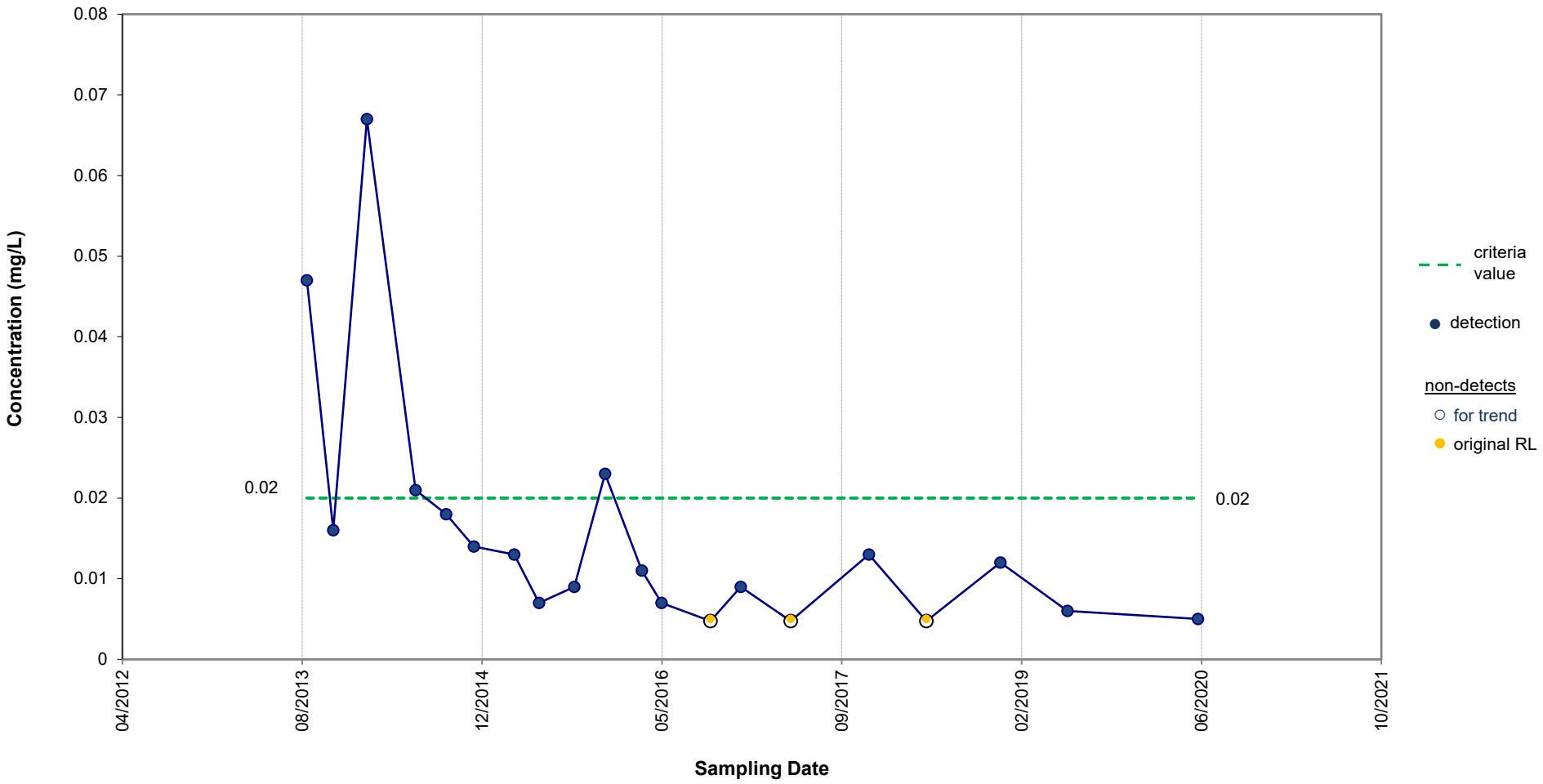
p value = 0.04 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-32, Chromium III

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

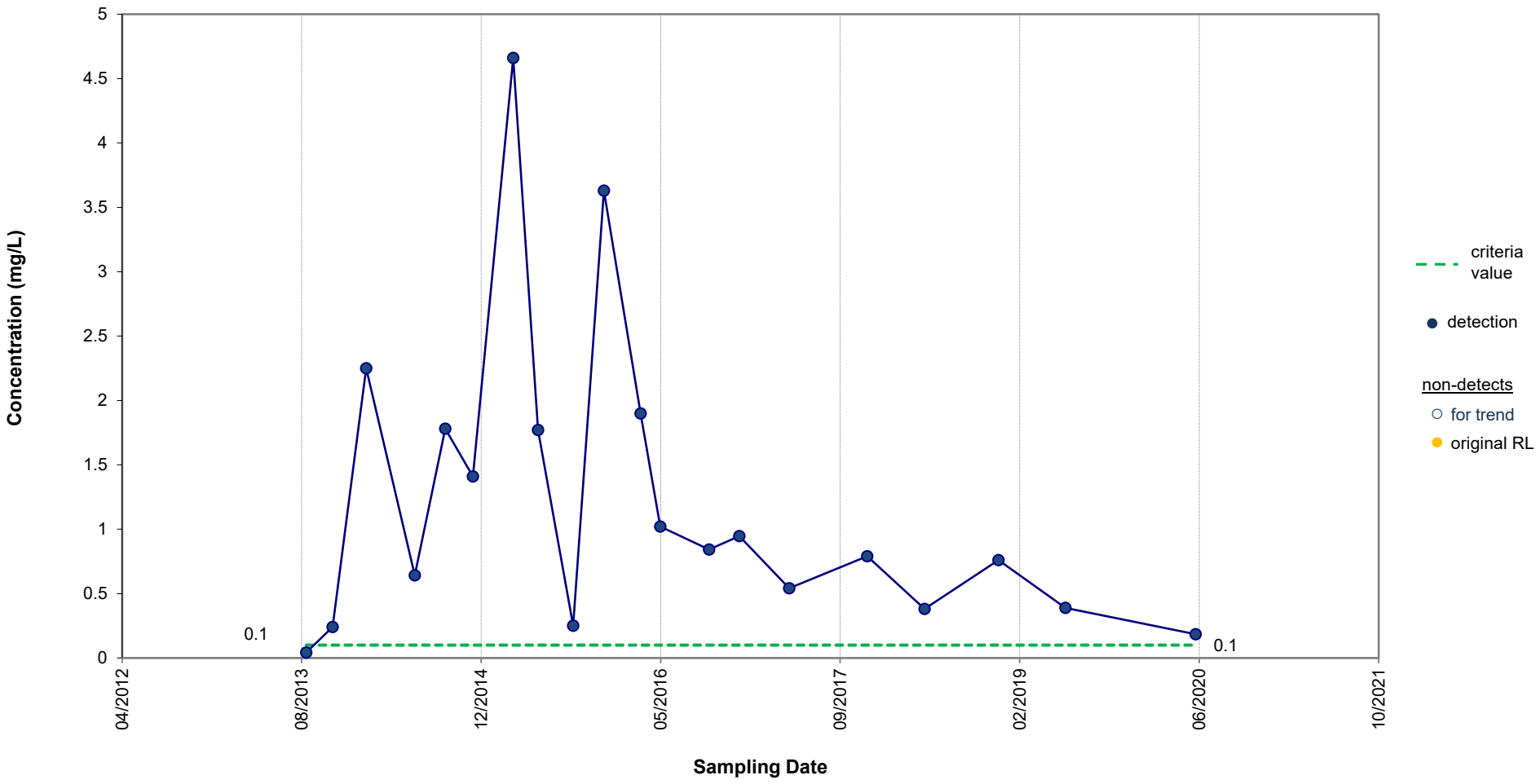
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-32, Copper

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

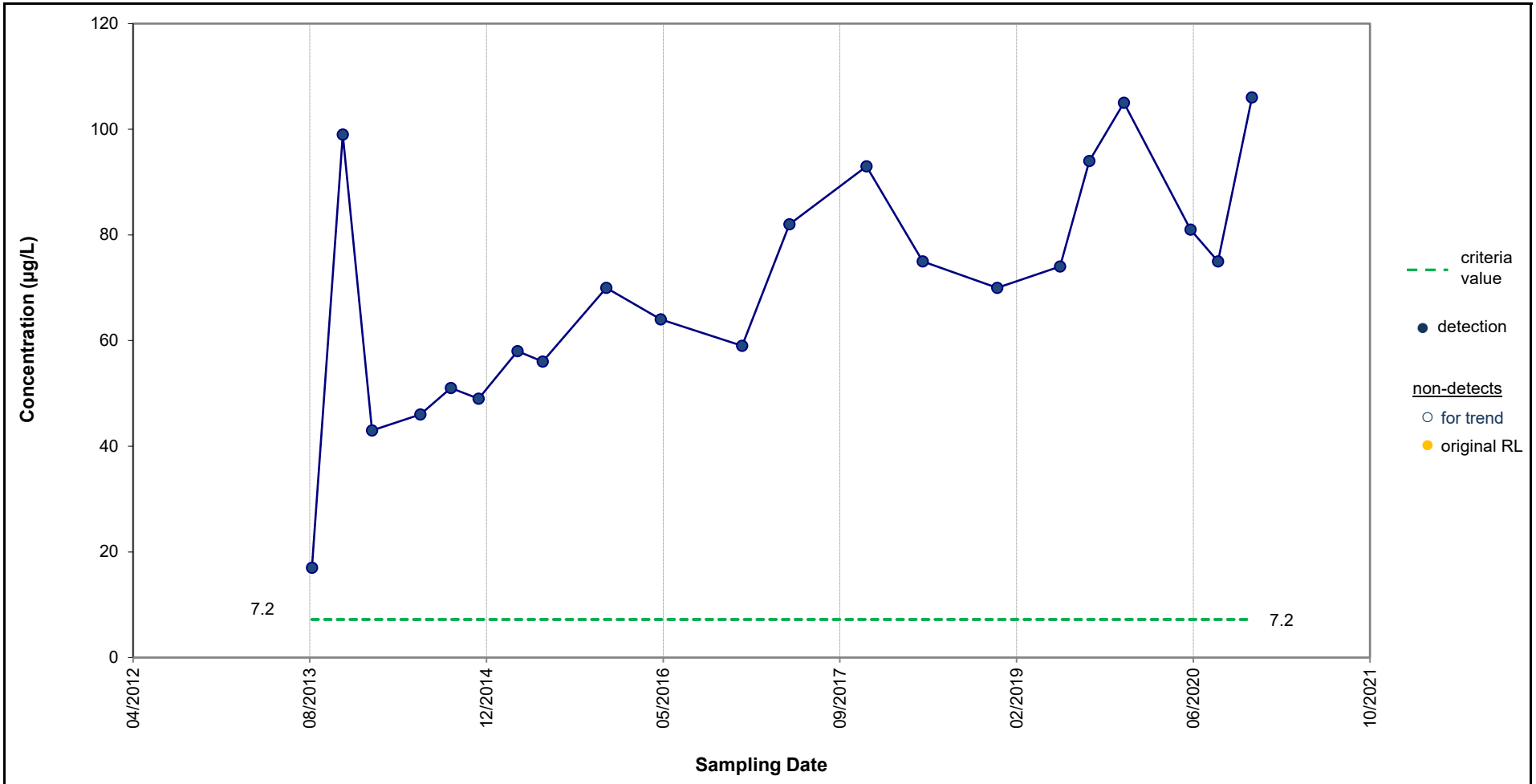
p value = 0.08 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-32, Nickel

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

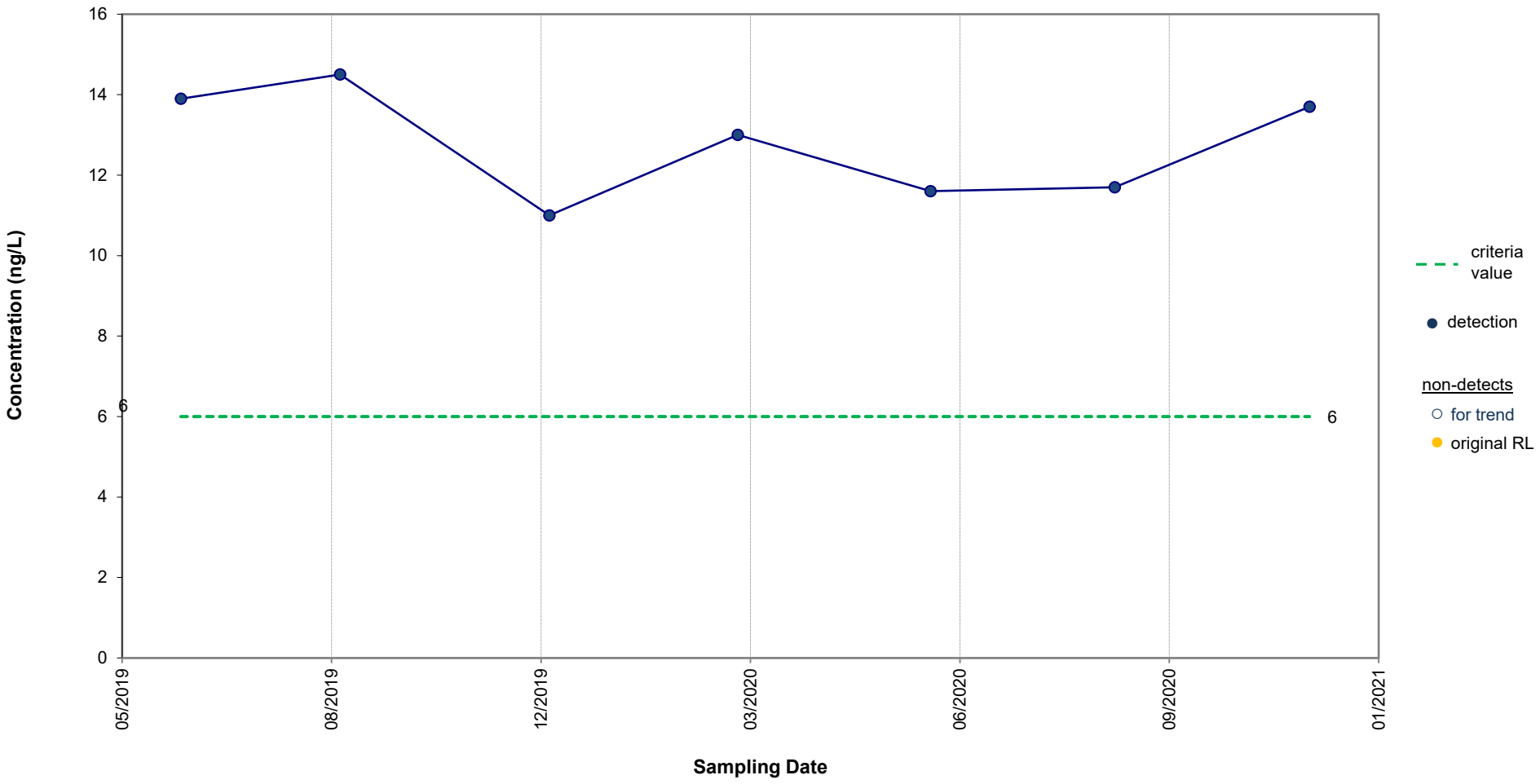
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-34, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

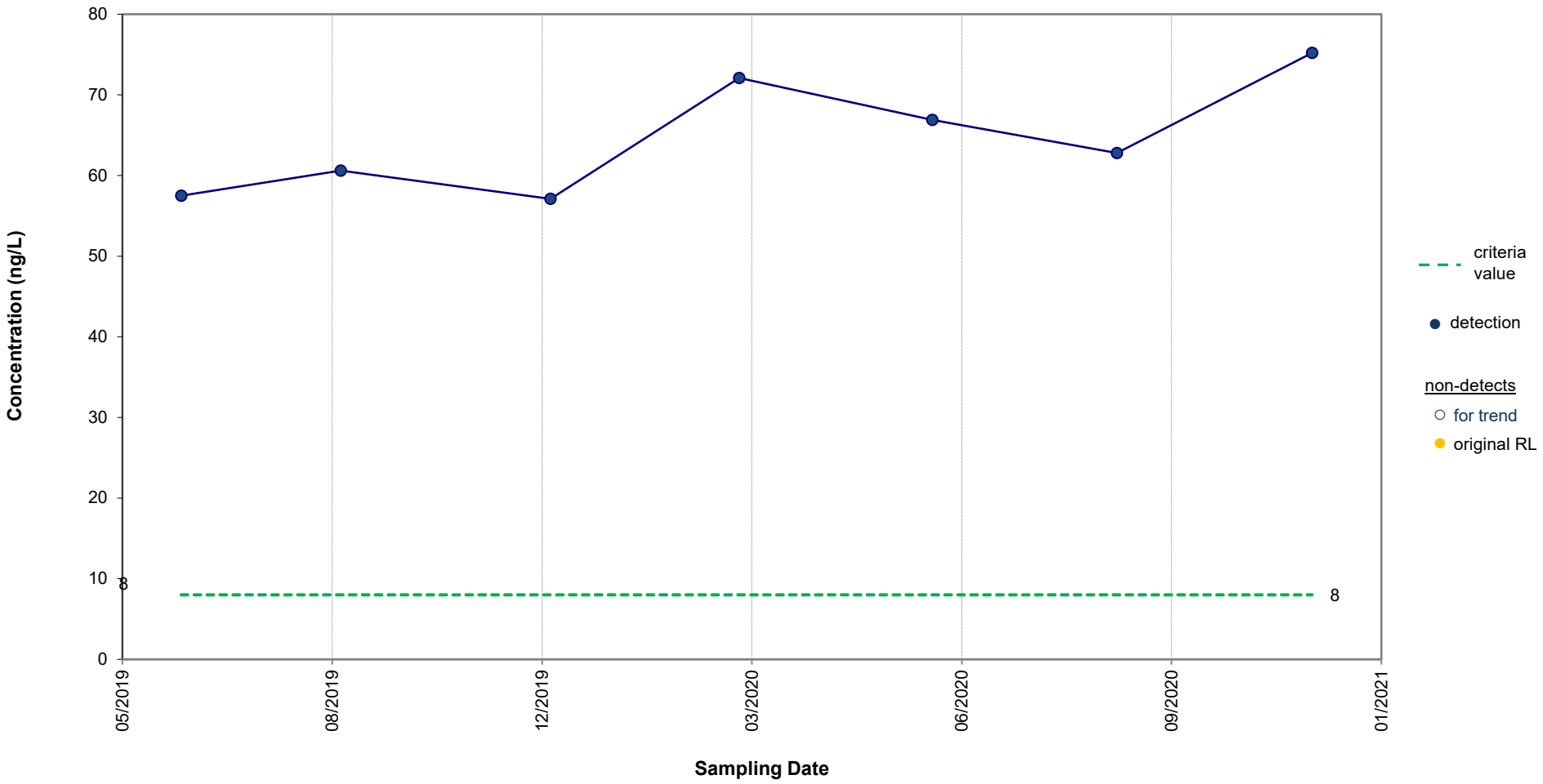
p value = 0.39 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-36R, PFNA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

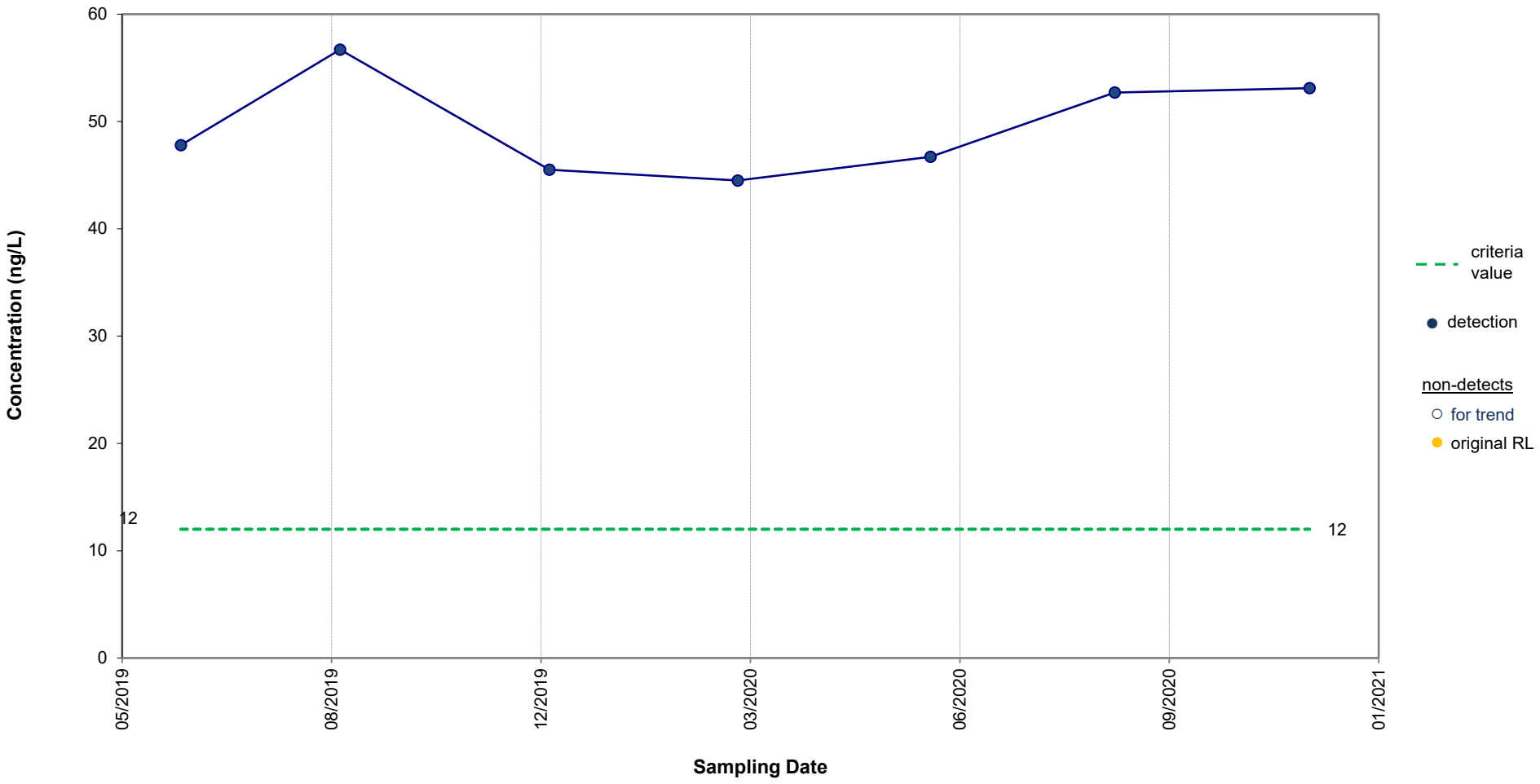
p value = 0.07 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-36R, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

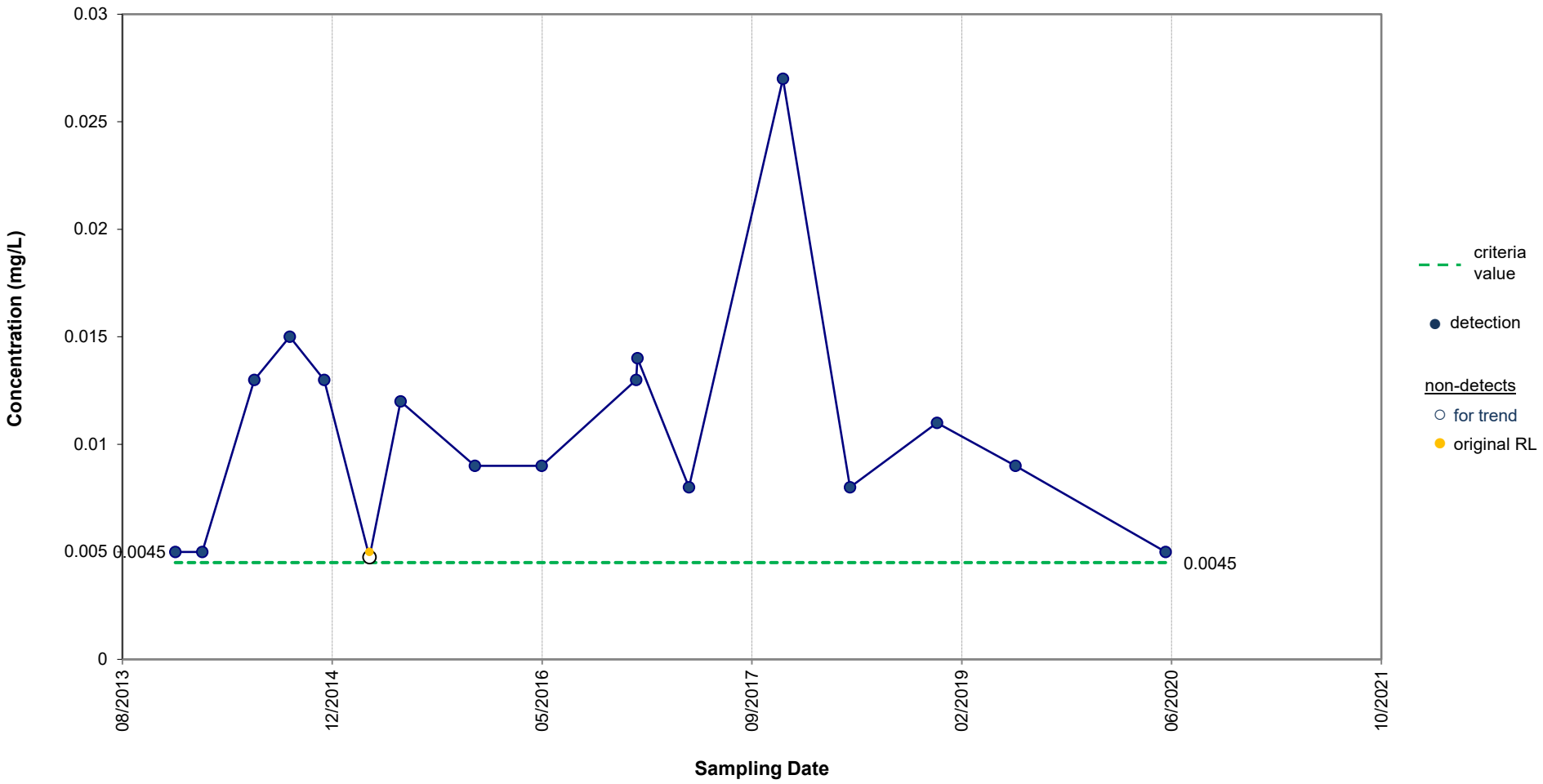
p value = 0.39 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-36R, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

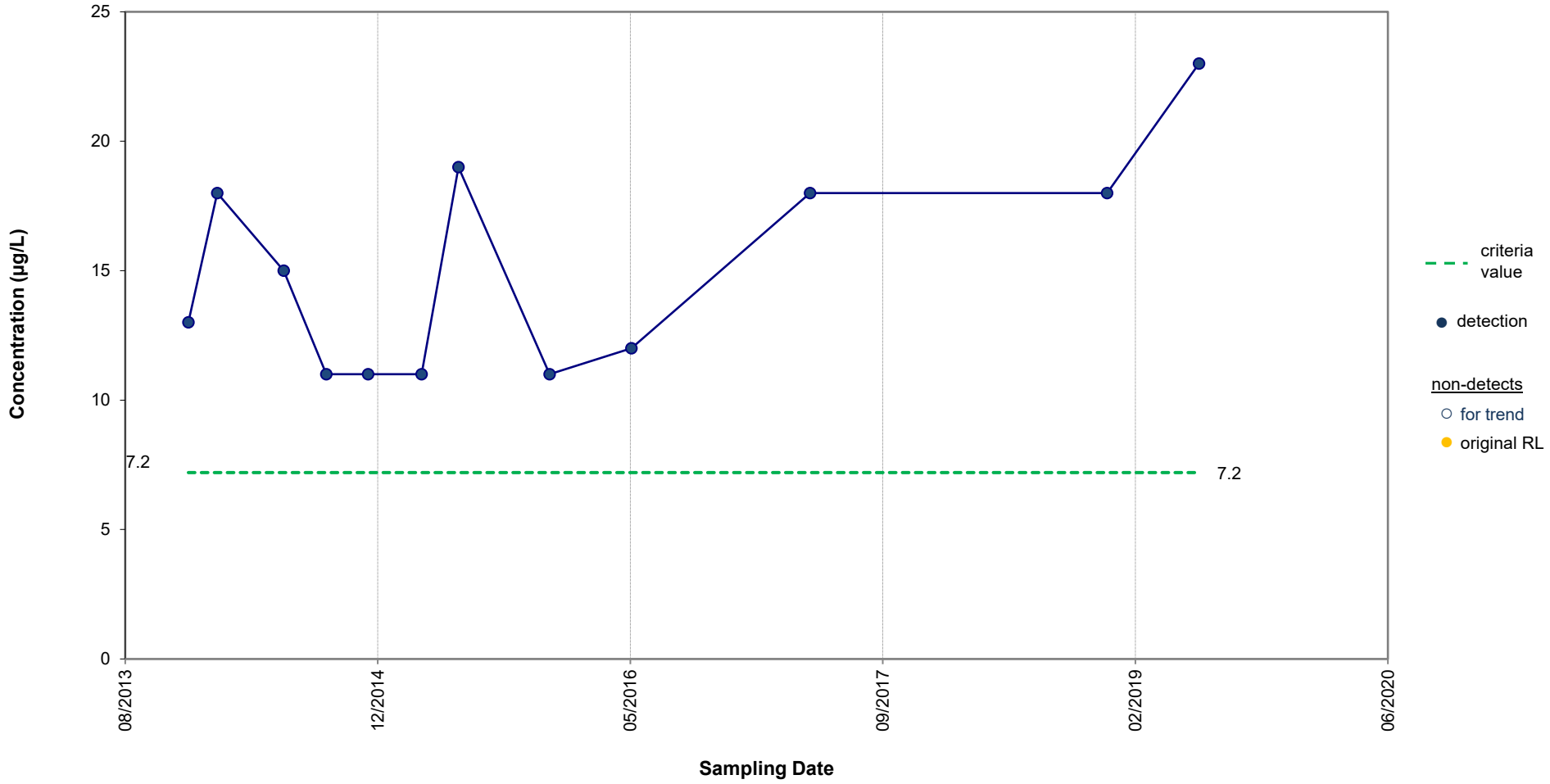
p value = 0.48 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-36R, Vanadium

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

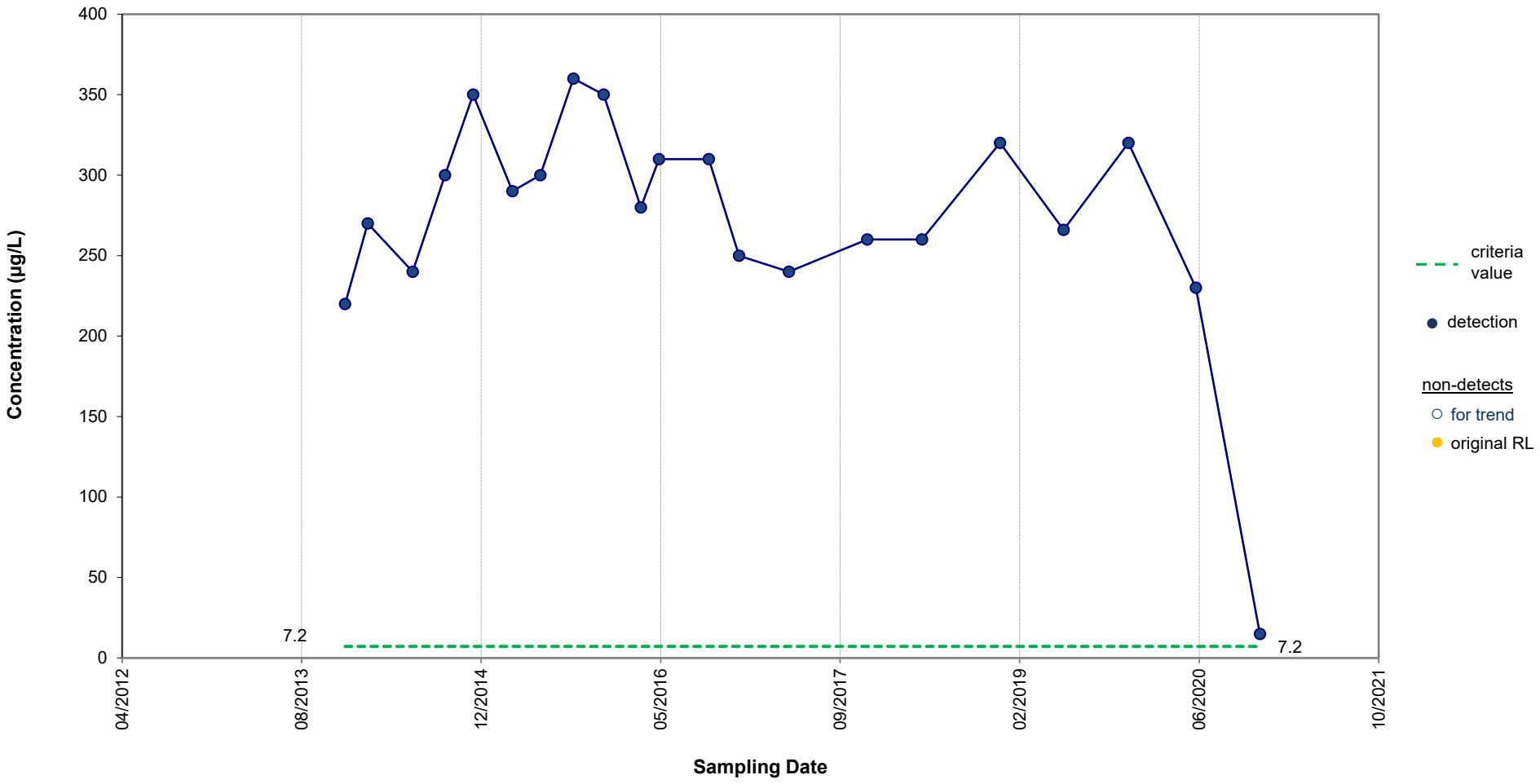
p value = 0.13 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-41, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

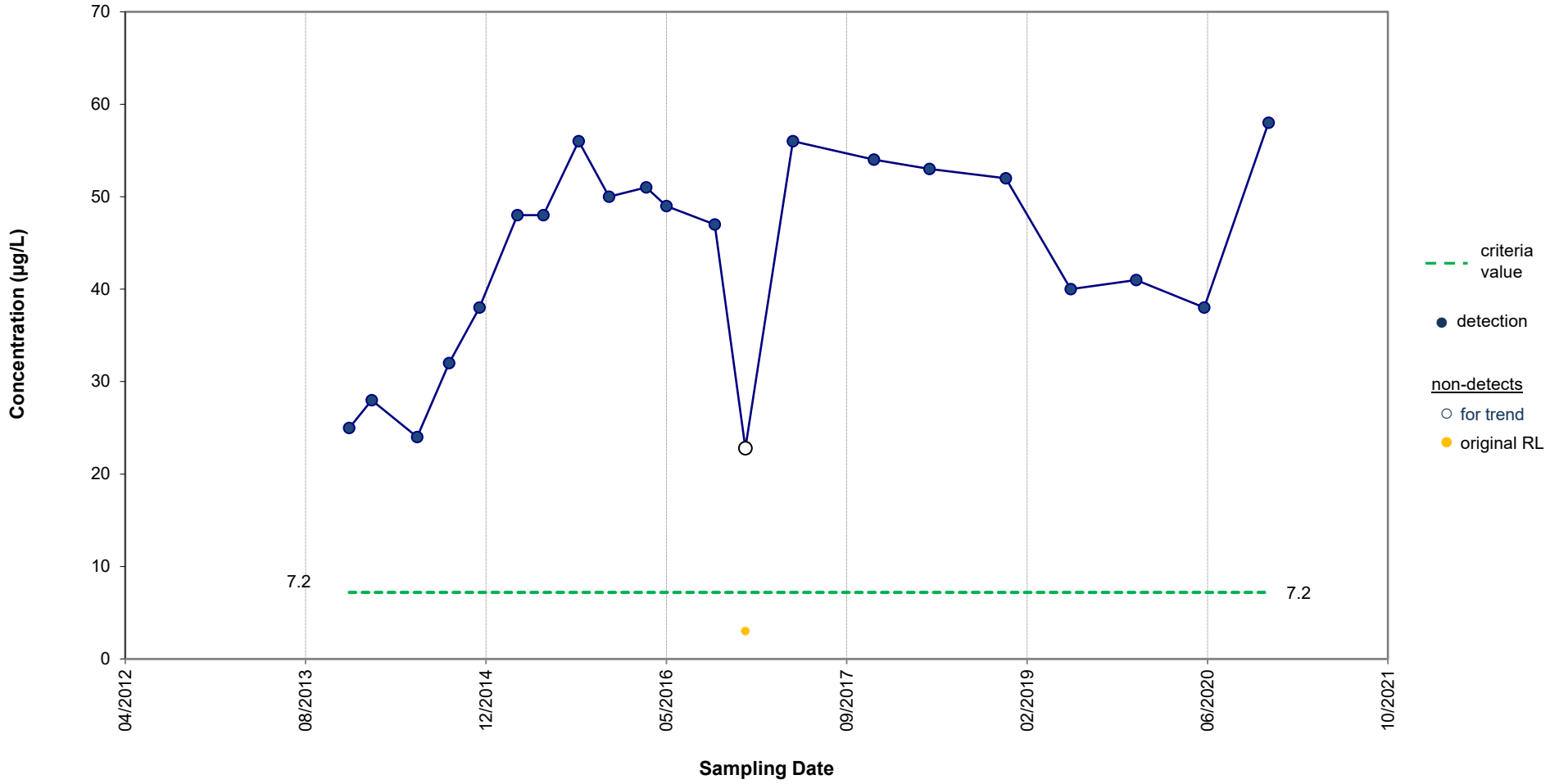
p value = 0.26 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-43, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

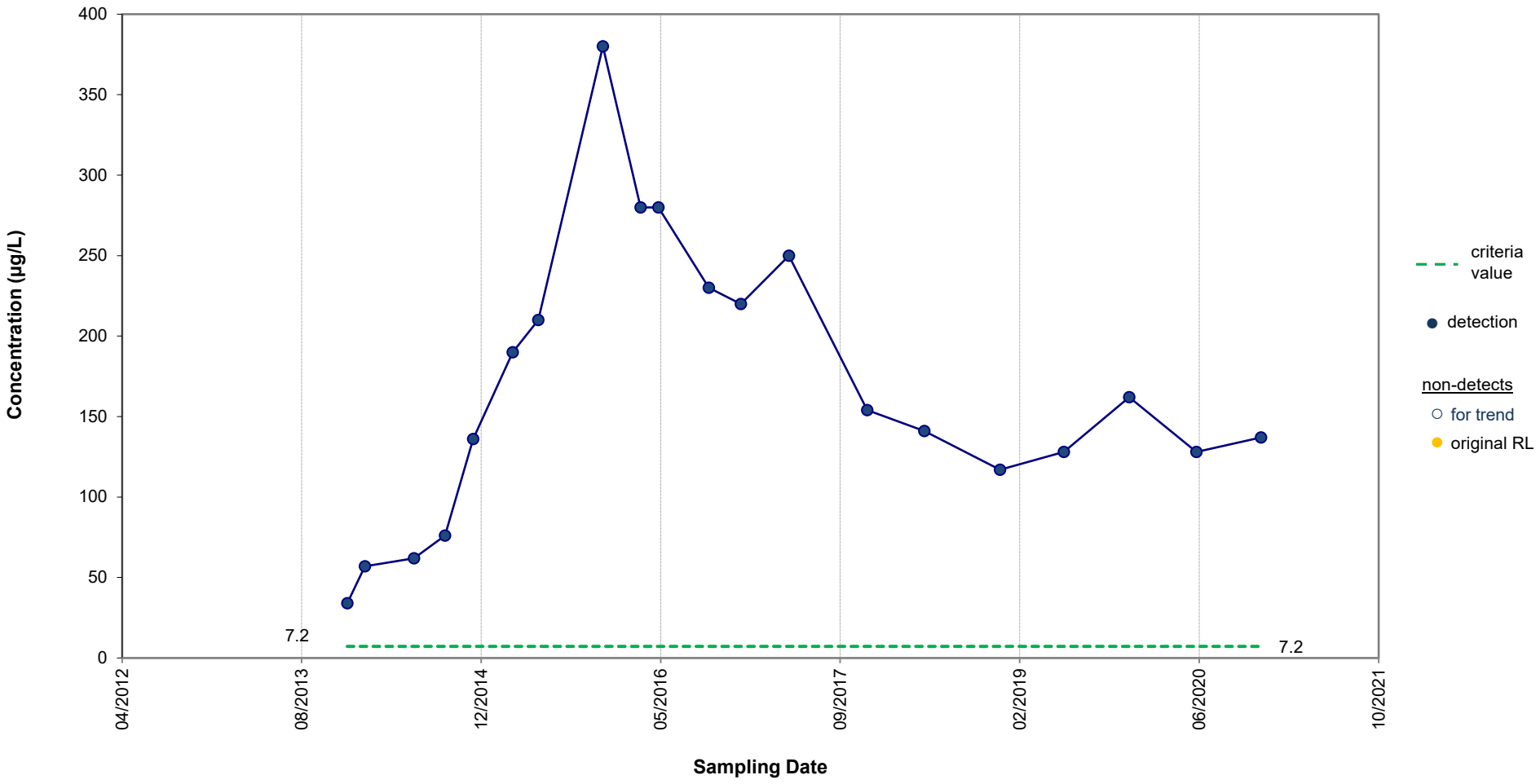
p value = 0.02 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-45, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

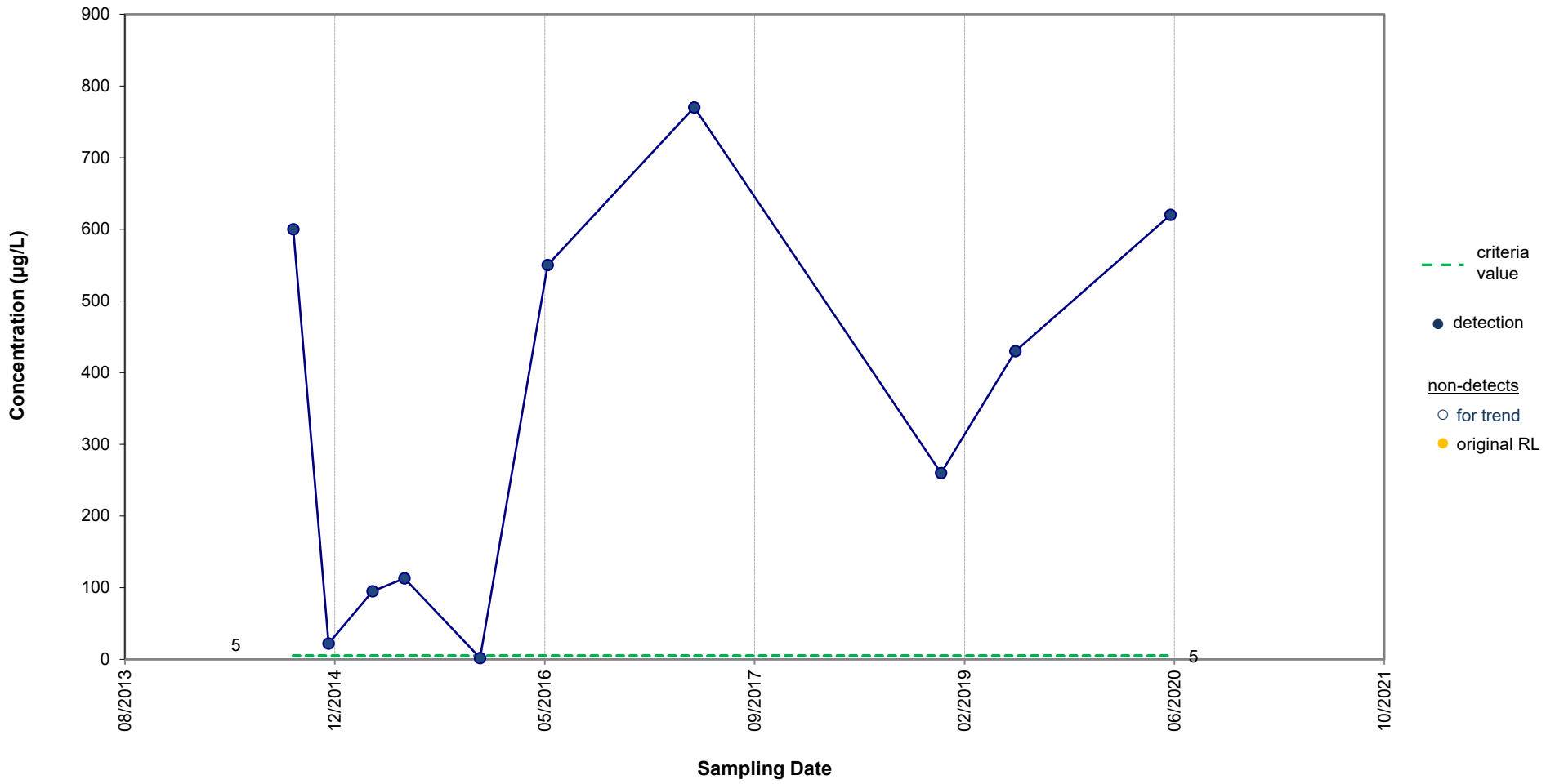
p value = 0.23 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-13-48, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

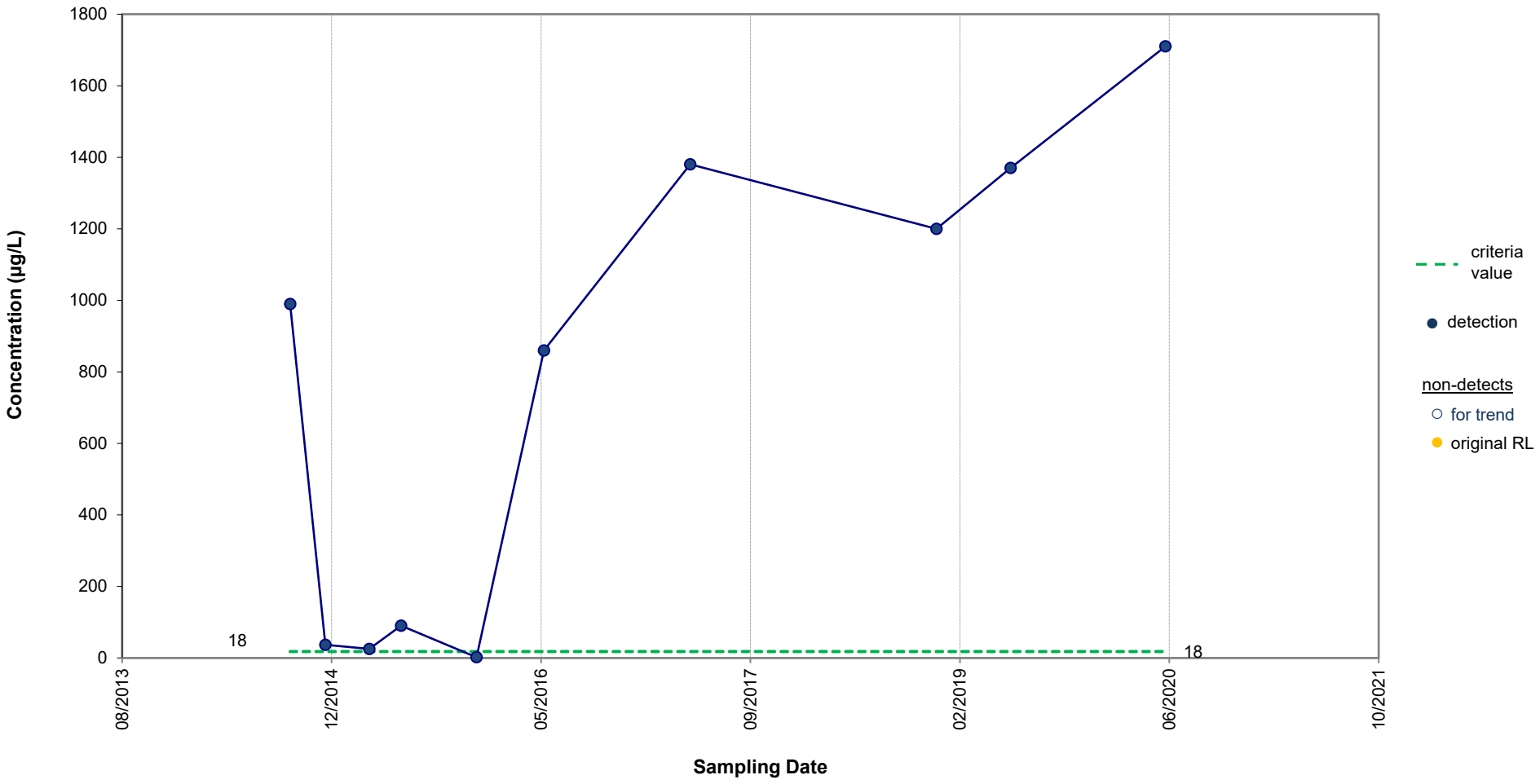
p value = 0.11 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-54, Benzene

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

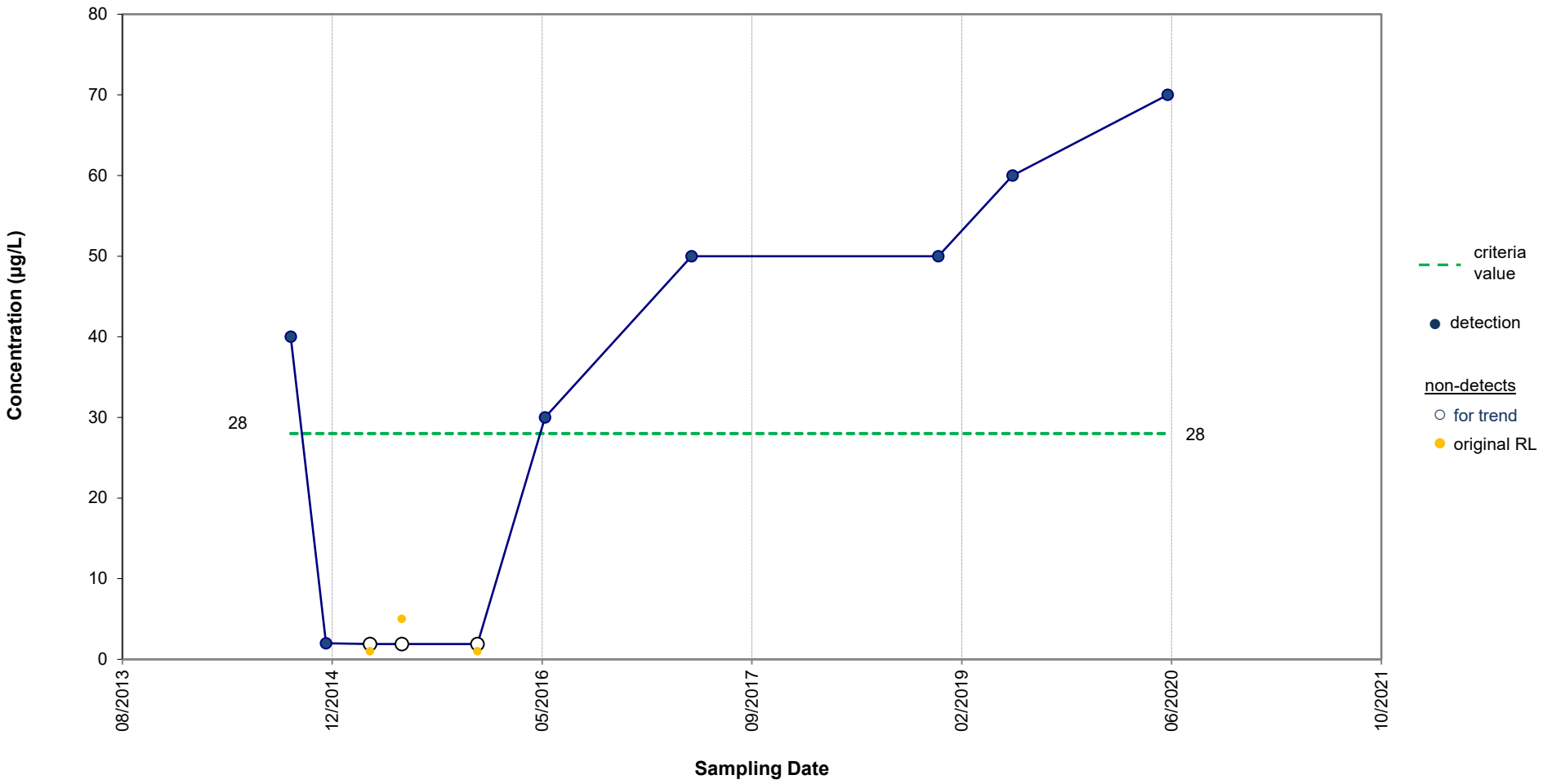
p value = 0.02 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-54, Ethylbenzene

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

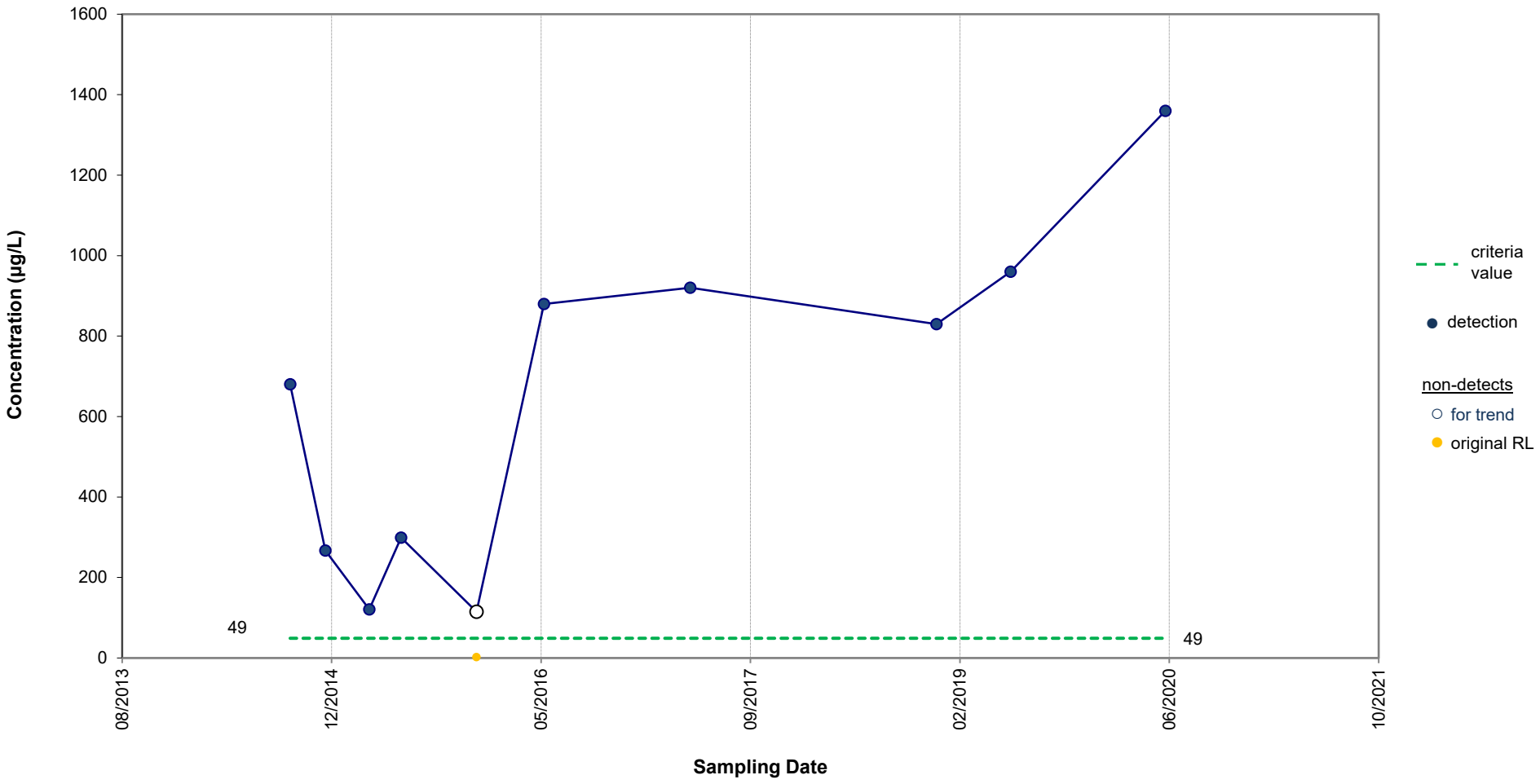
p value = 0.01 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-54, Isopropyl Benzene

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

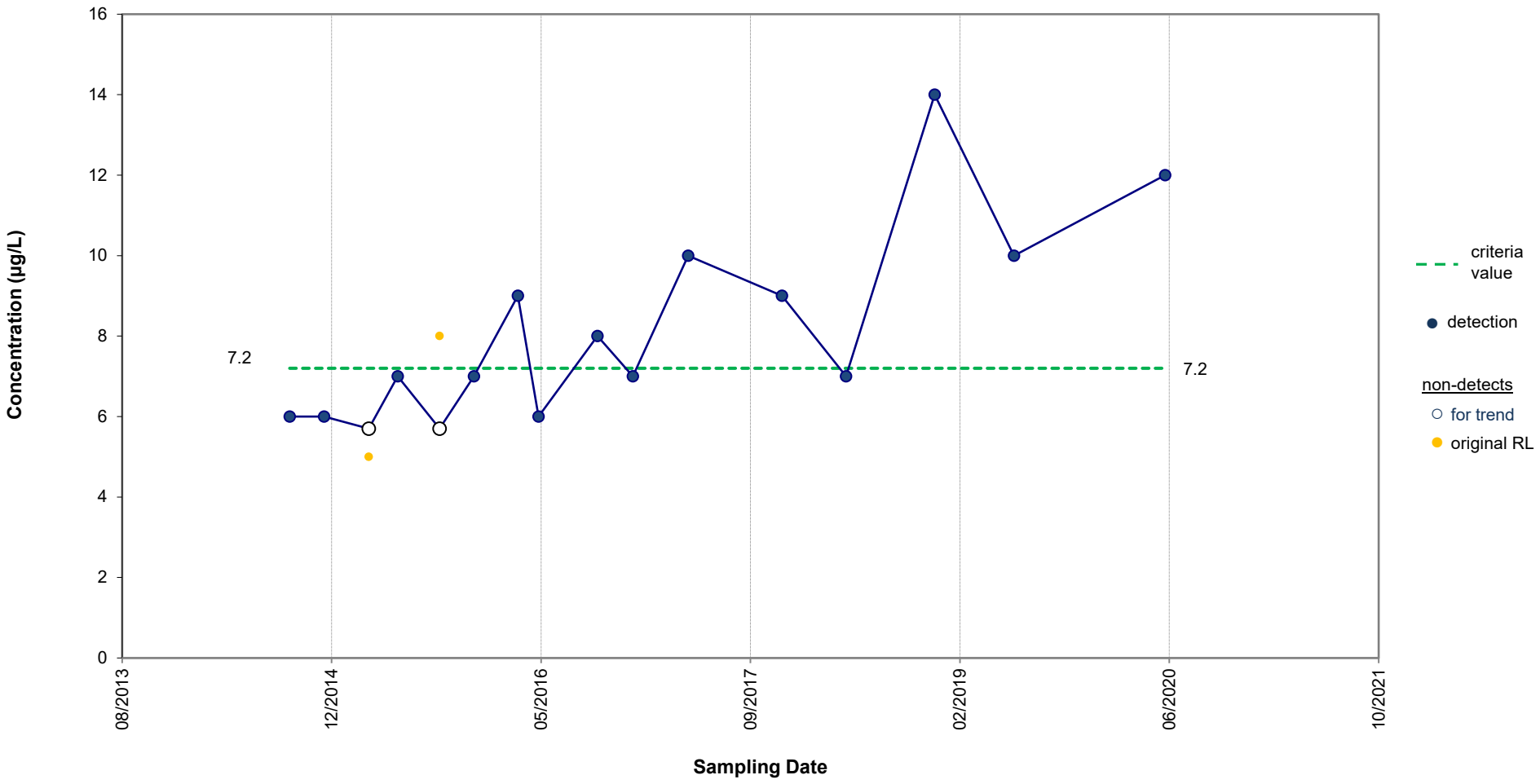
p value = 0.01 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-54, Total Xylenes

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

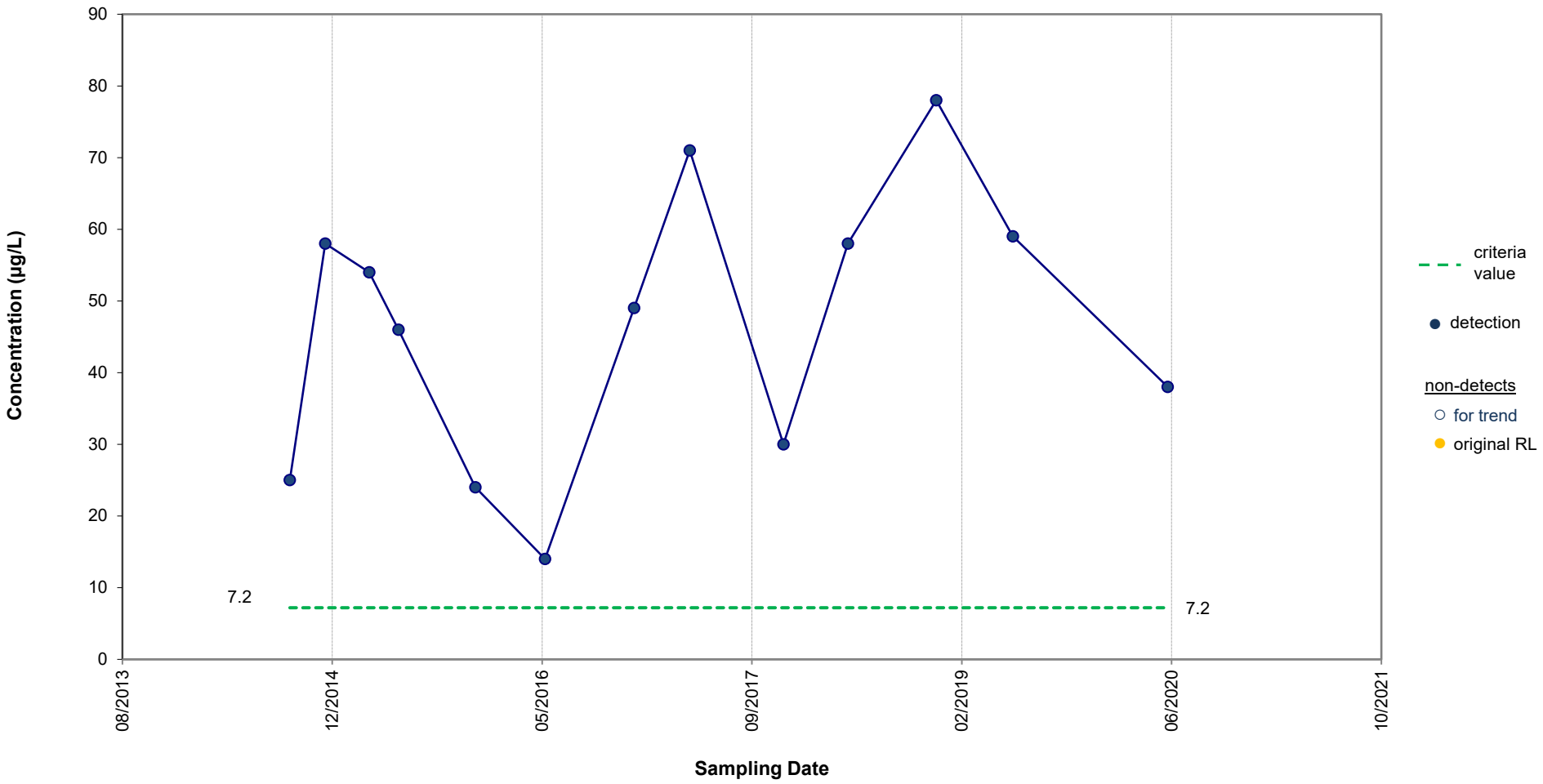
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-56, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

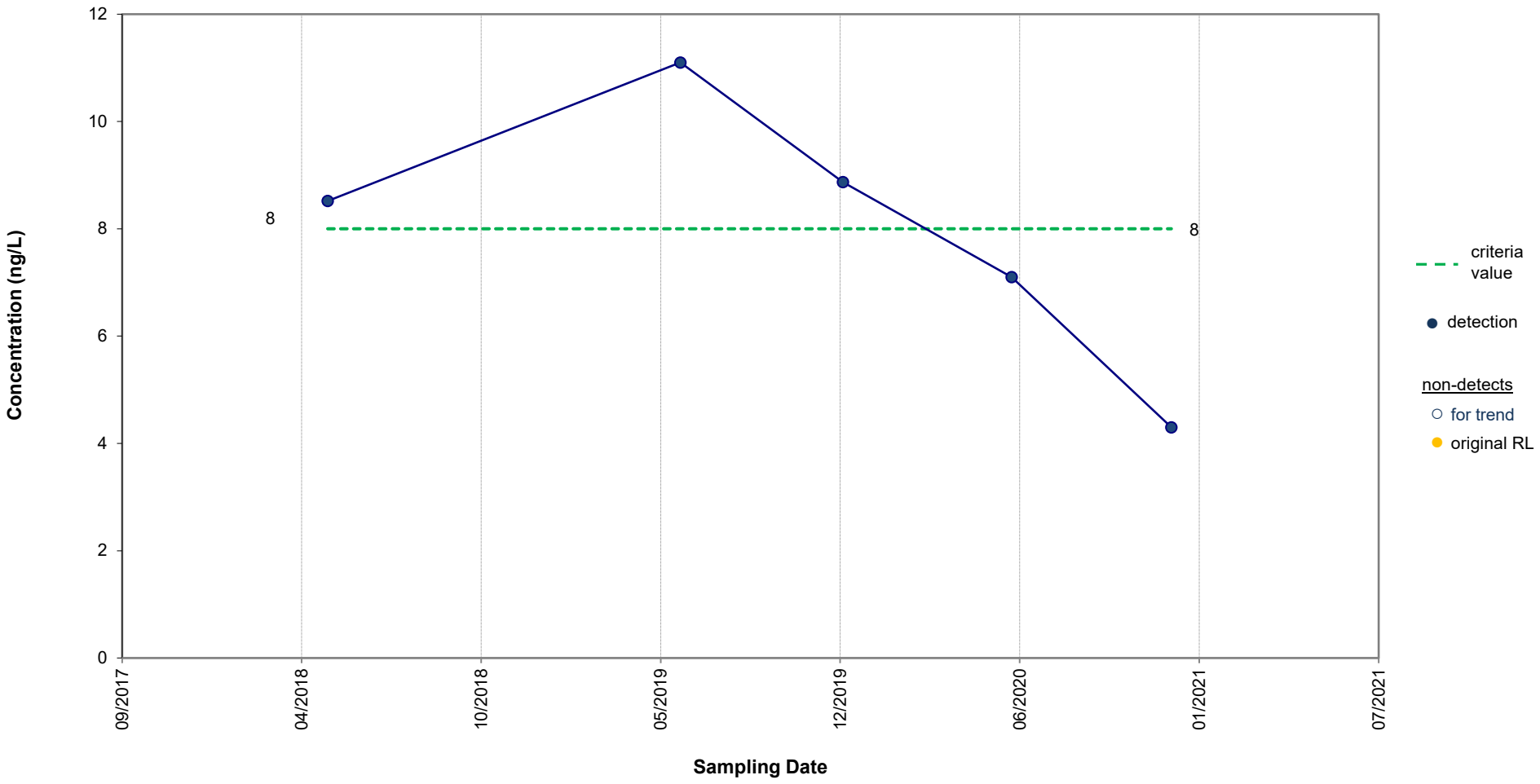
p value = 0.16 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-58, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

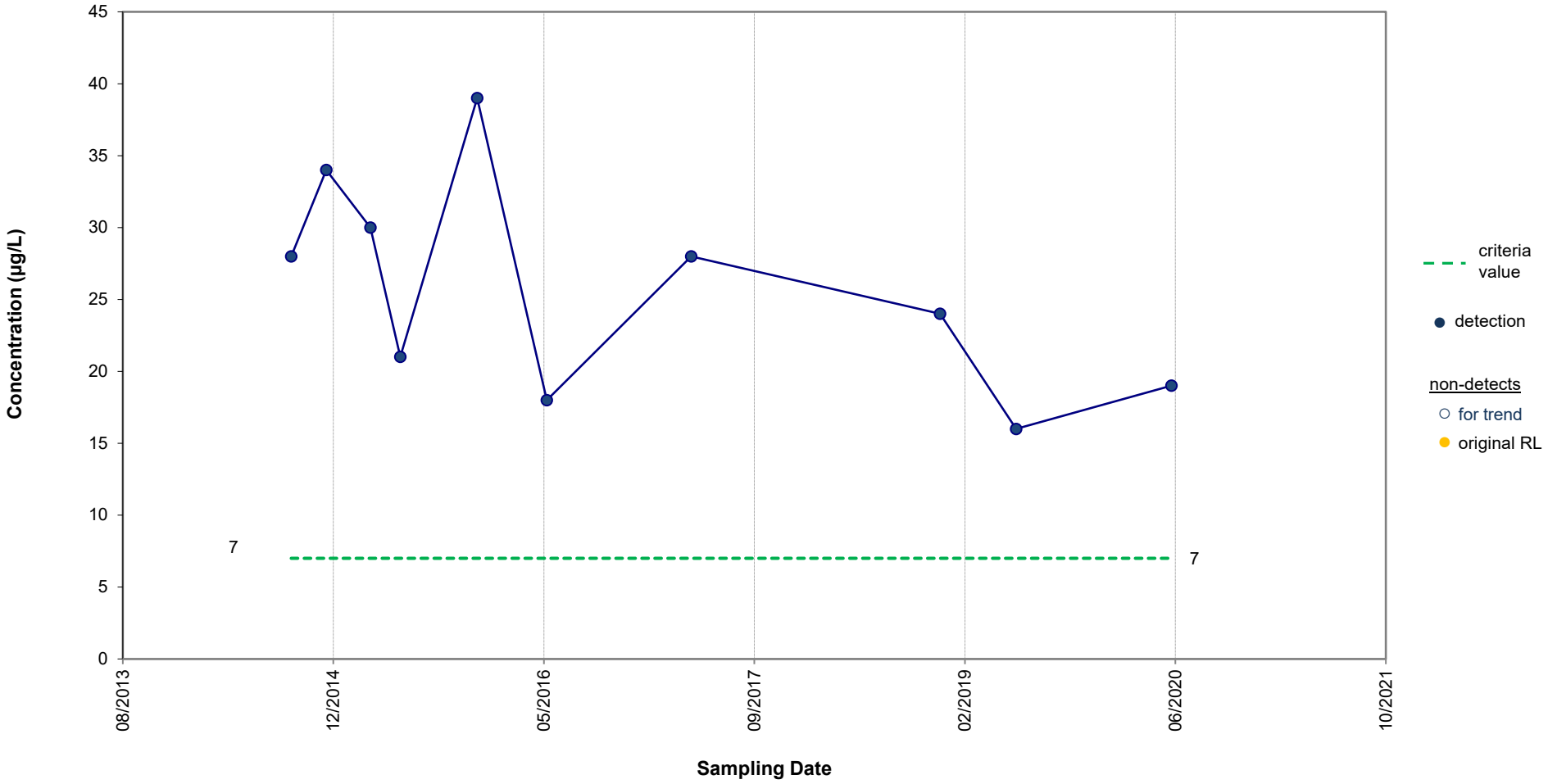
p value = 0.12 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-58, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

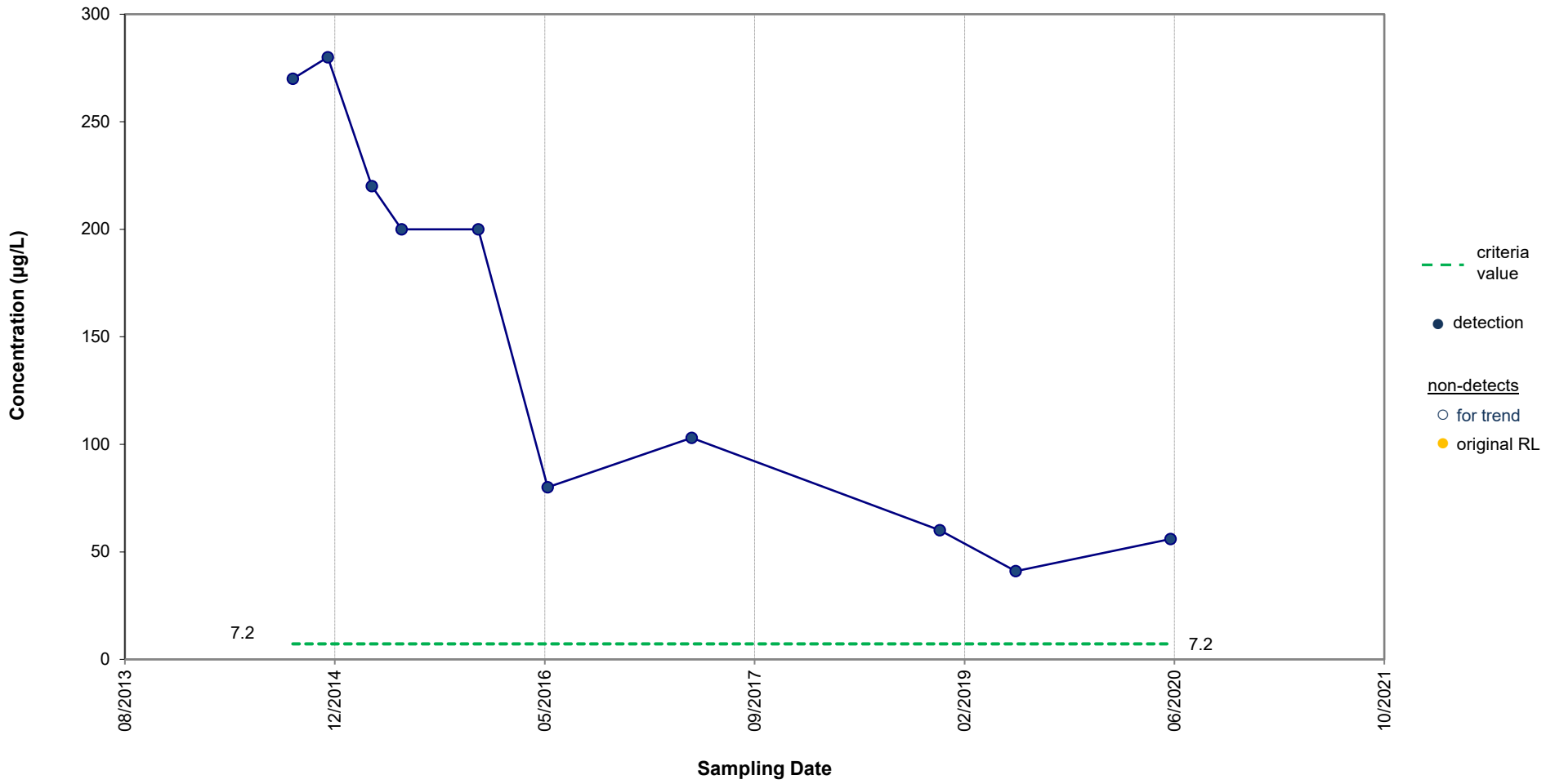
p value = 0.05 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-59, 1,1-Dichloroethene

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

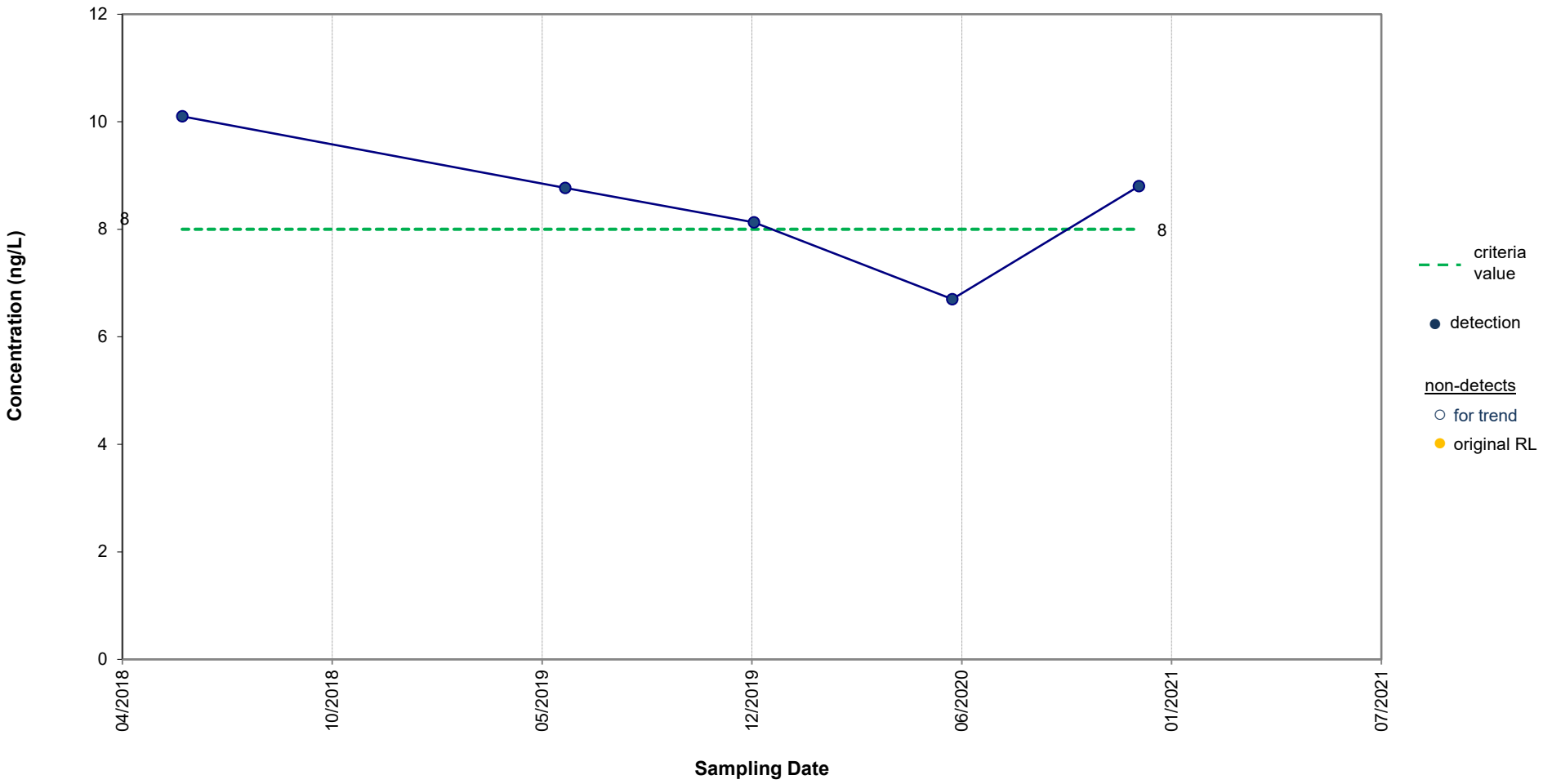
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-59, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

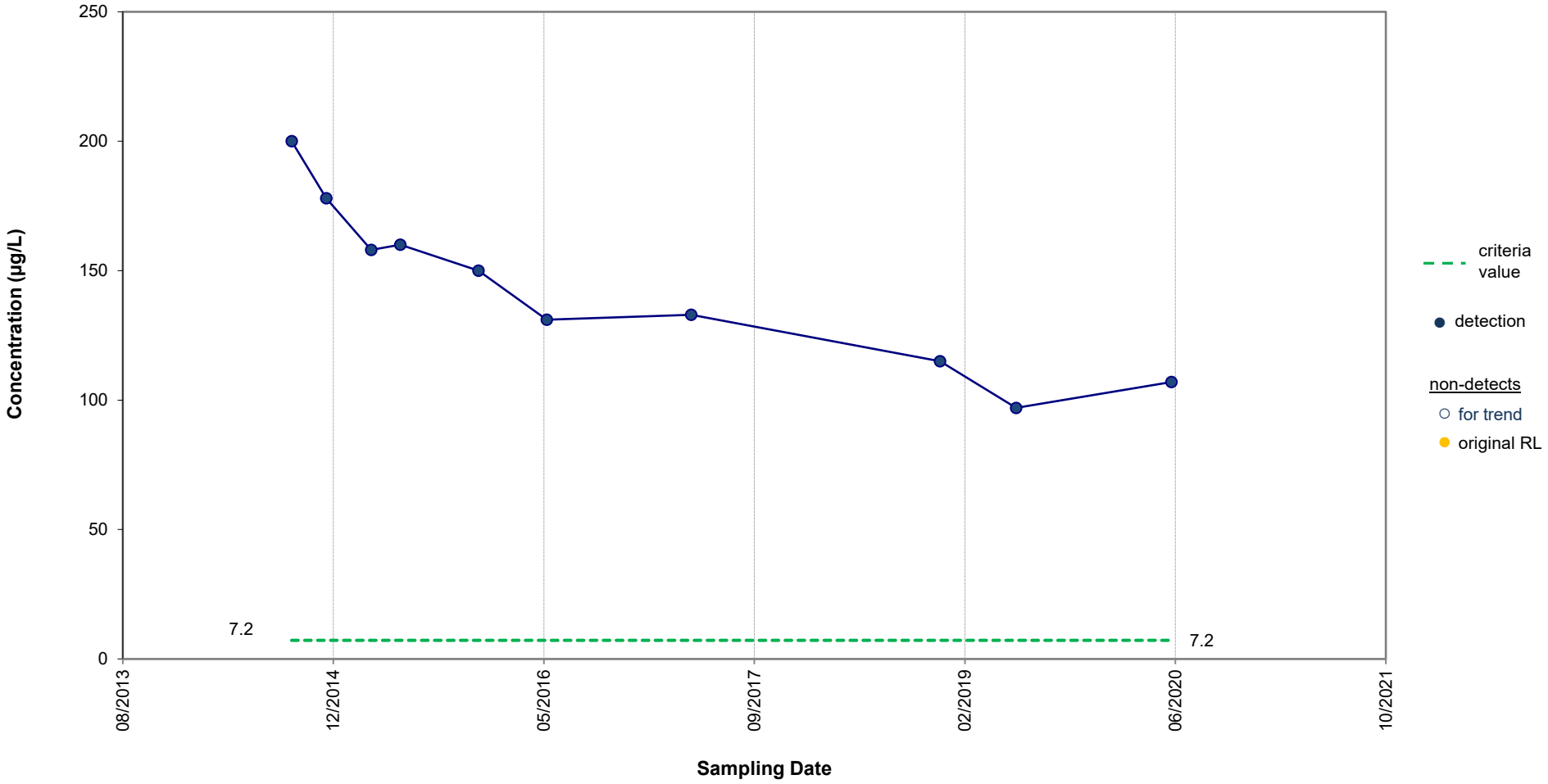
p value = 0.24 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-59, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

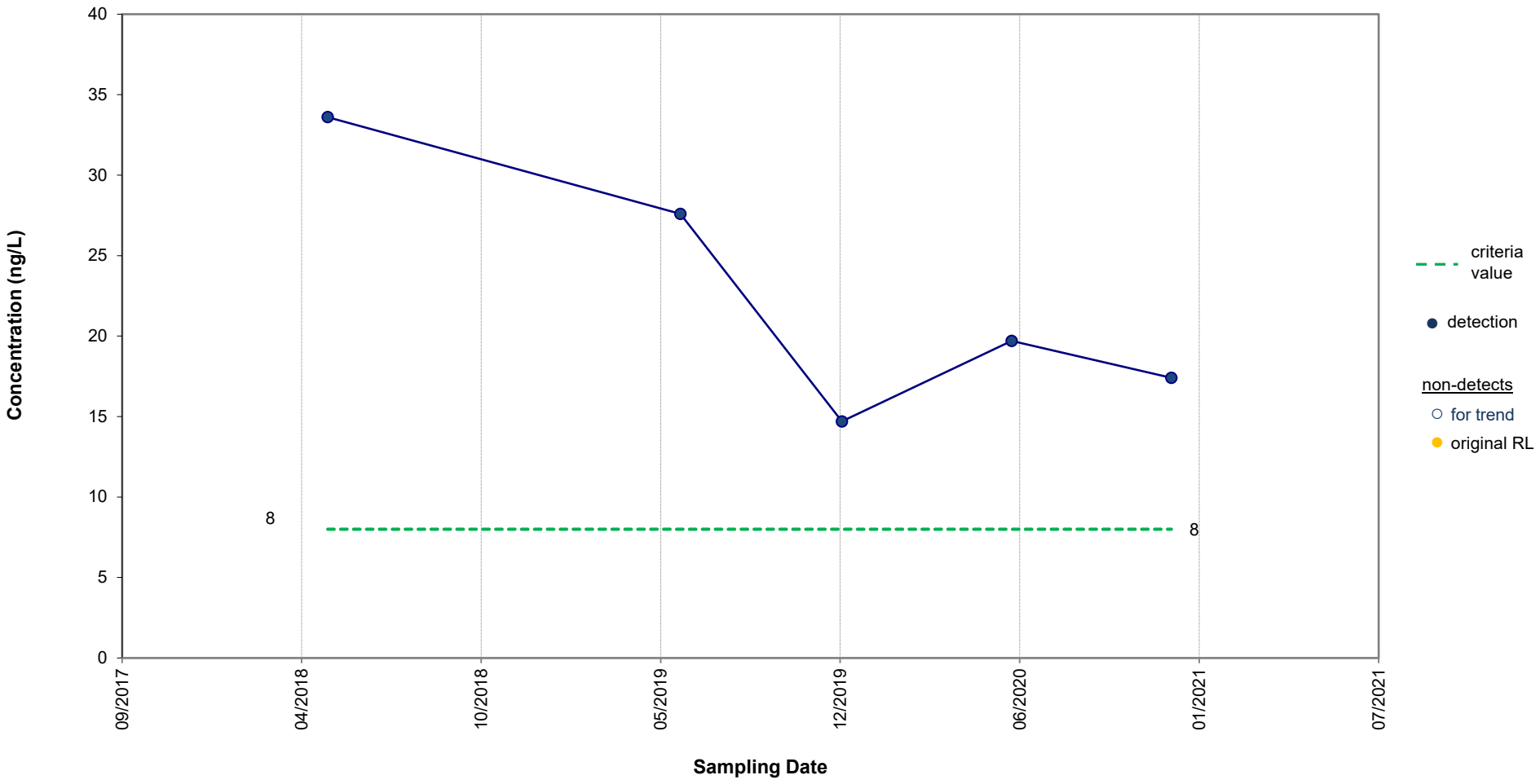
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-60, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

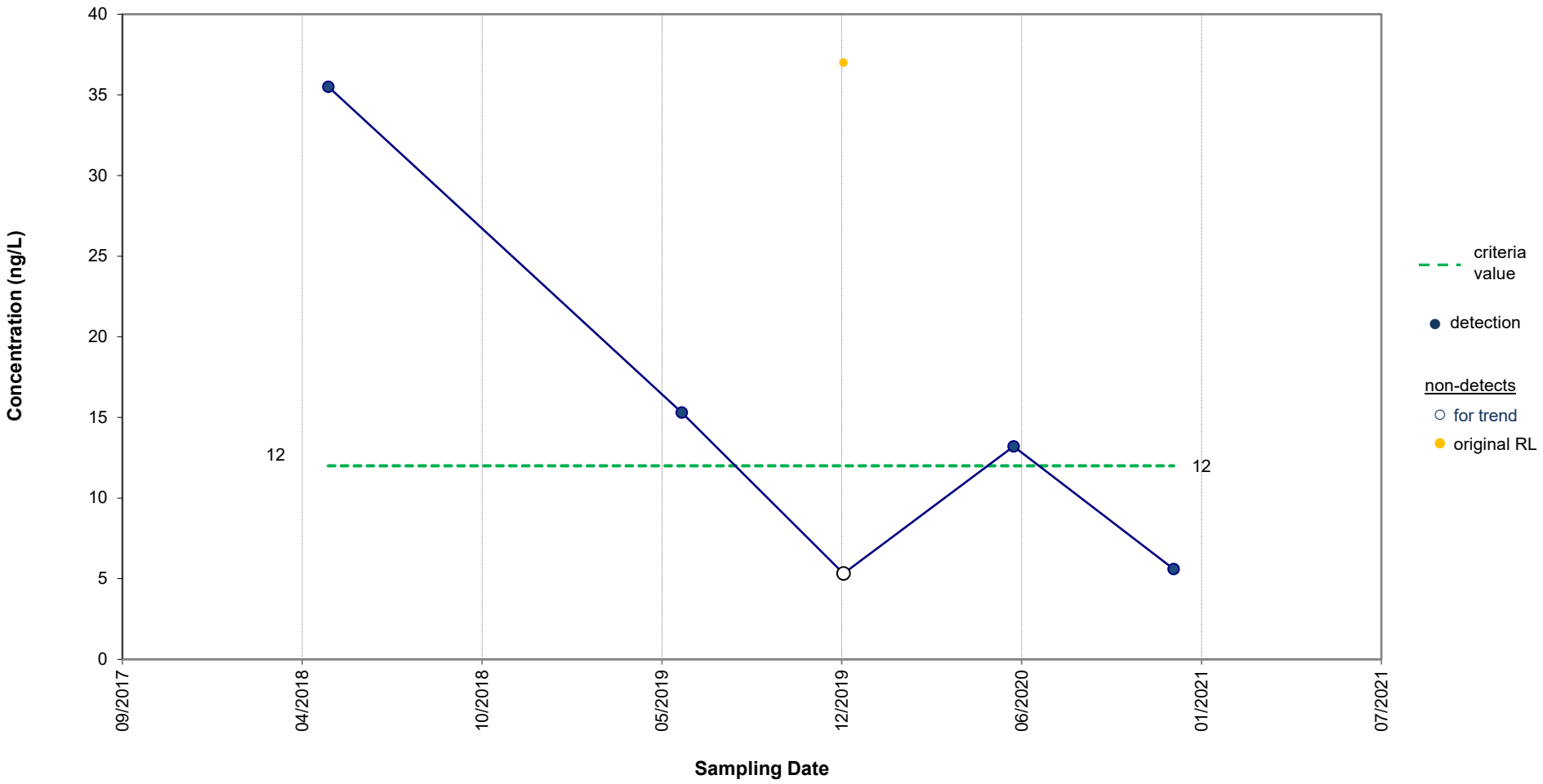
p value = 0.12 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-60, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

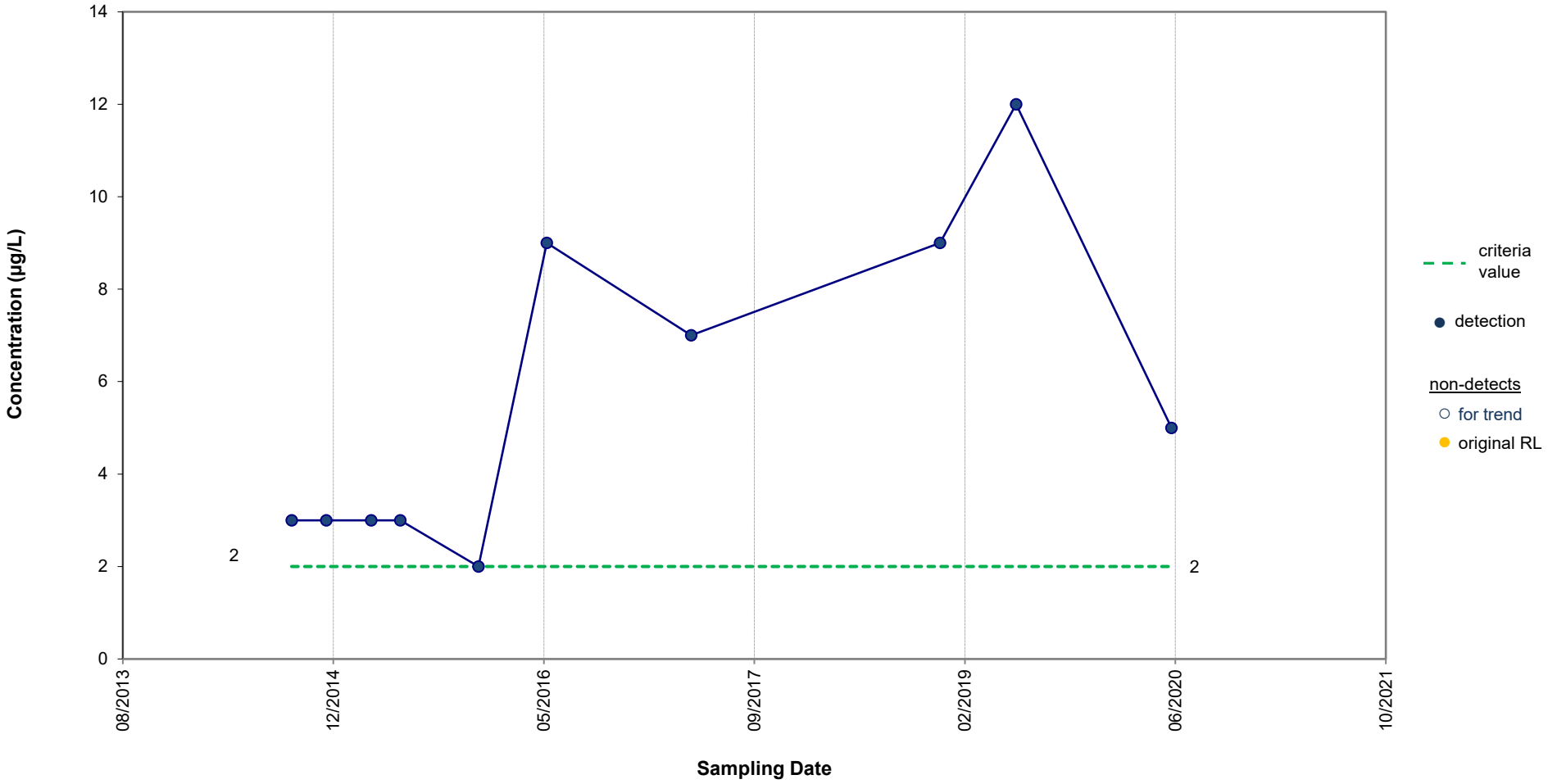
p value = 0.12 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-60, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

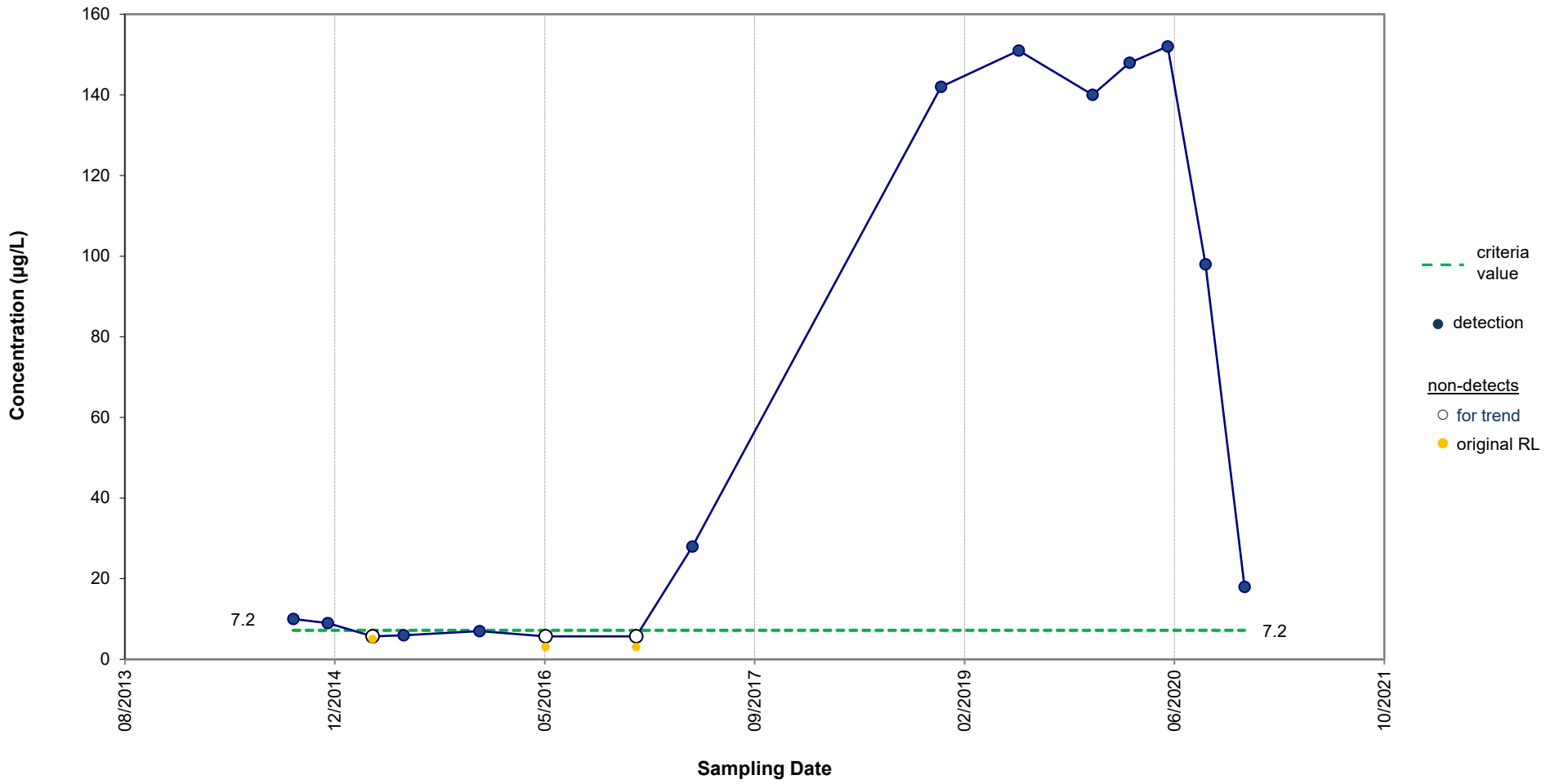
p value = 0.05 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-60, Vinyl Chloride

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

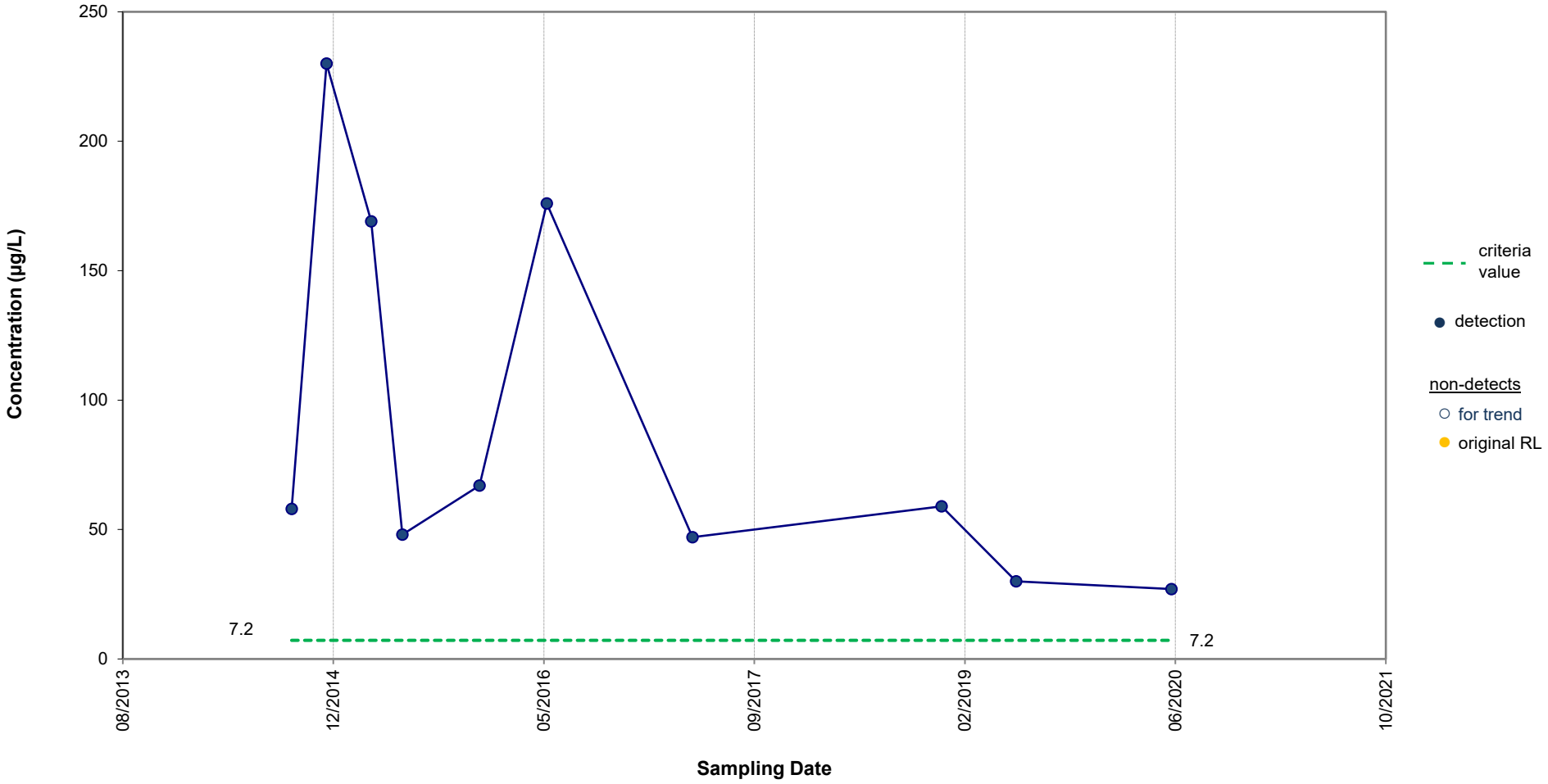
p value = 0.02 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-61, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

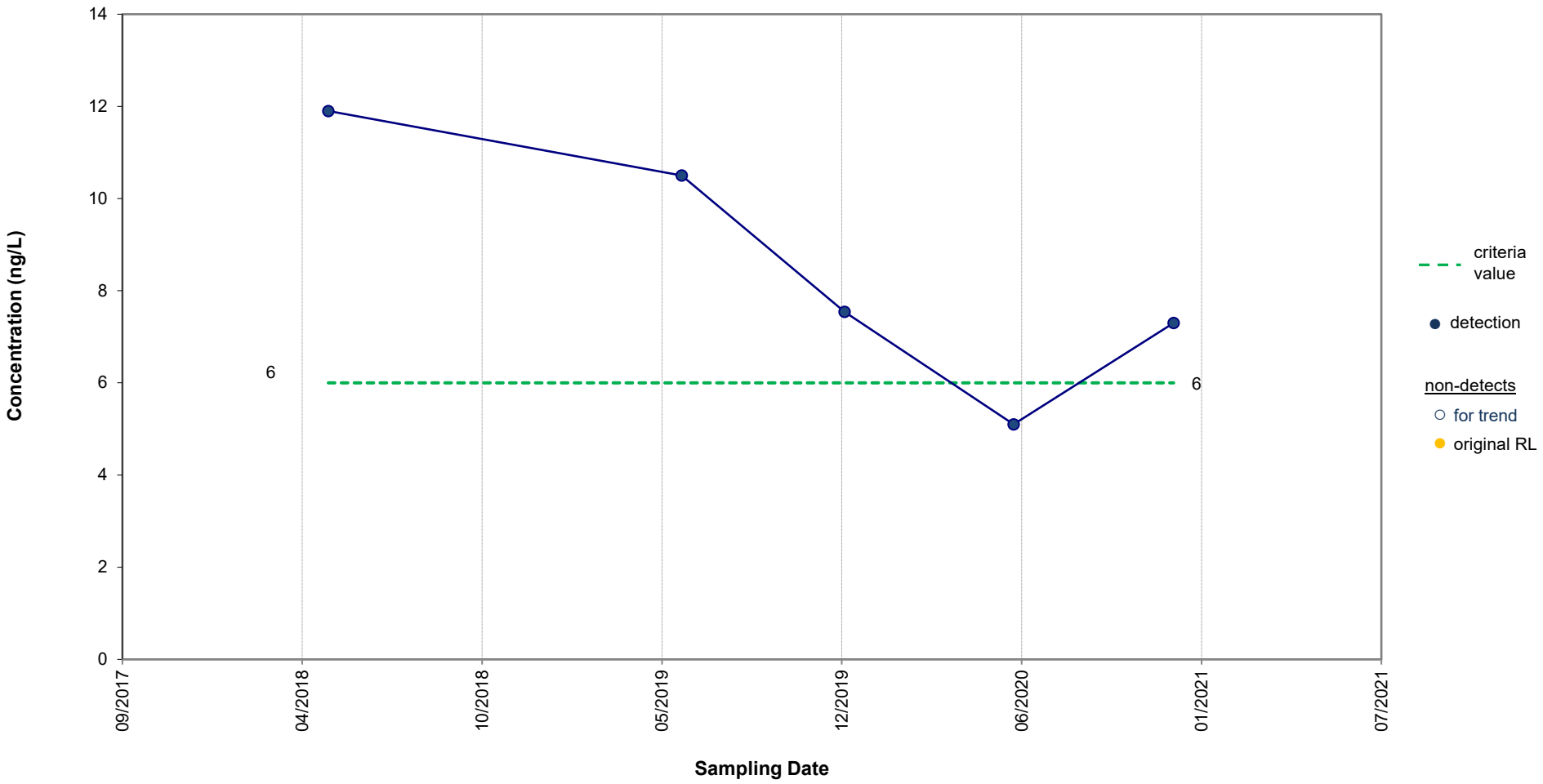
p value = 0.02 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-62, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

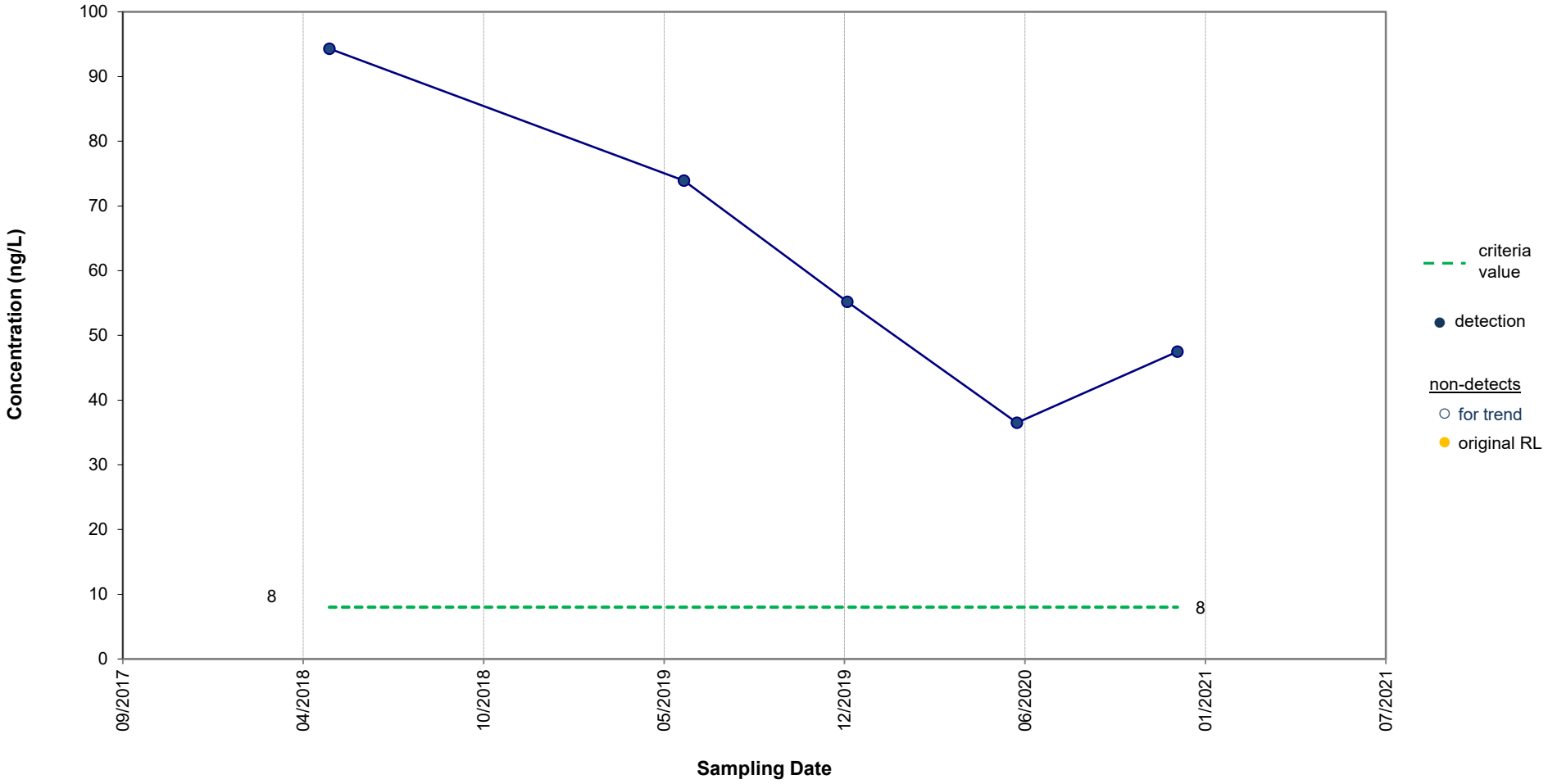
p value = 0.04 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-62, PFNA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

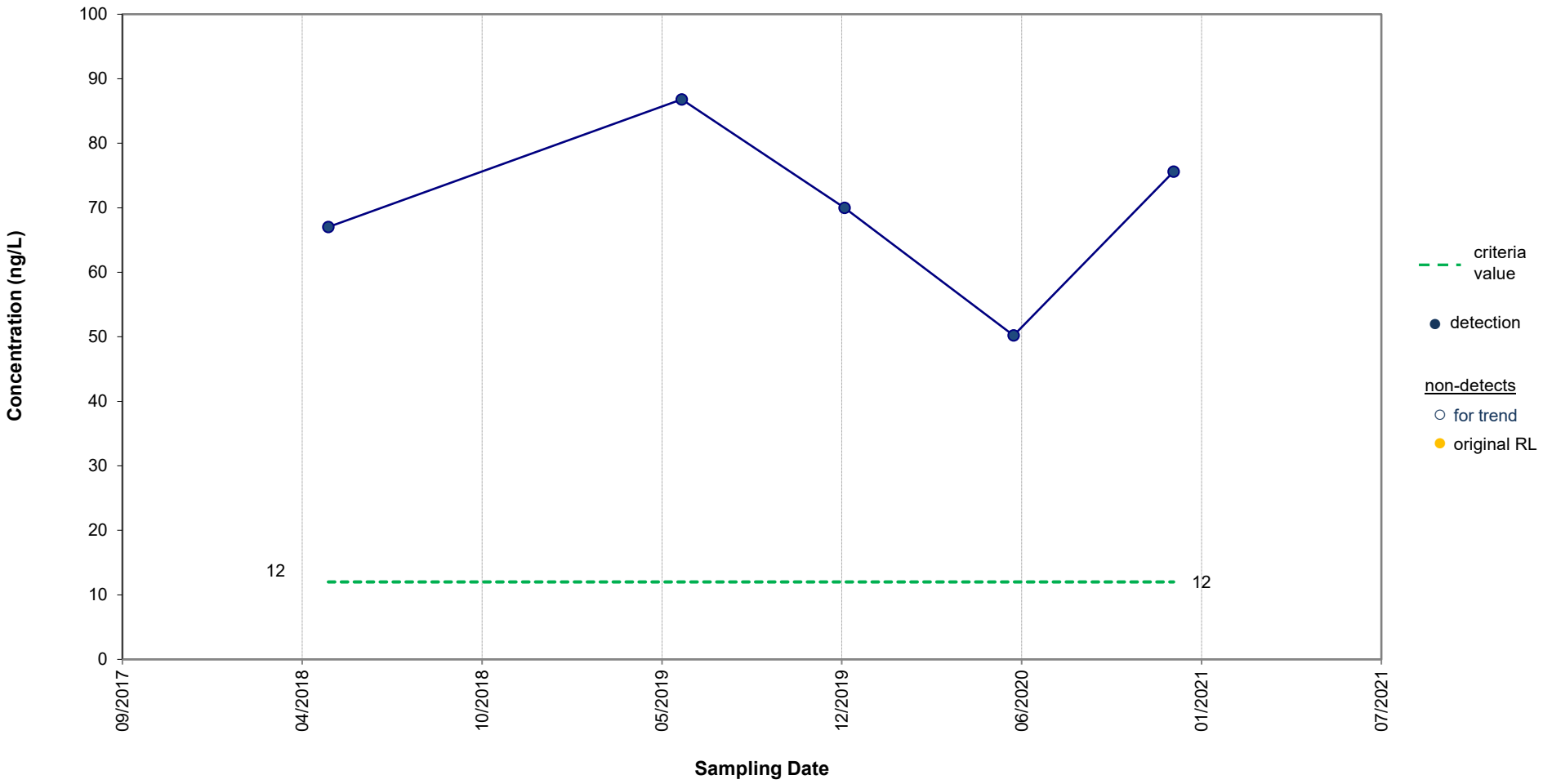
p value = 0.04 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-62, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

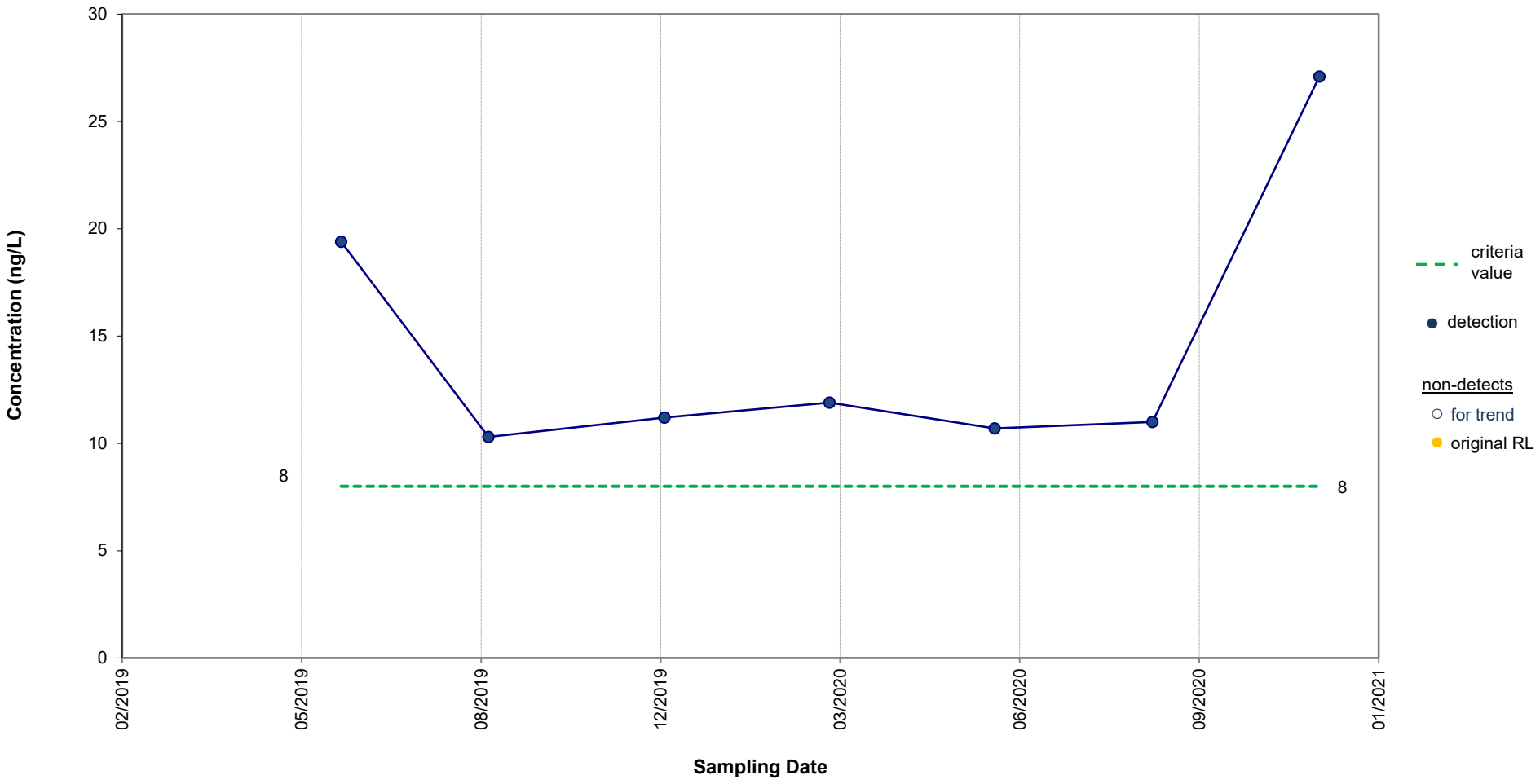
p value = 0.59 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-62, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

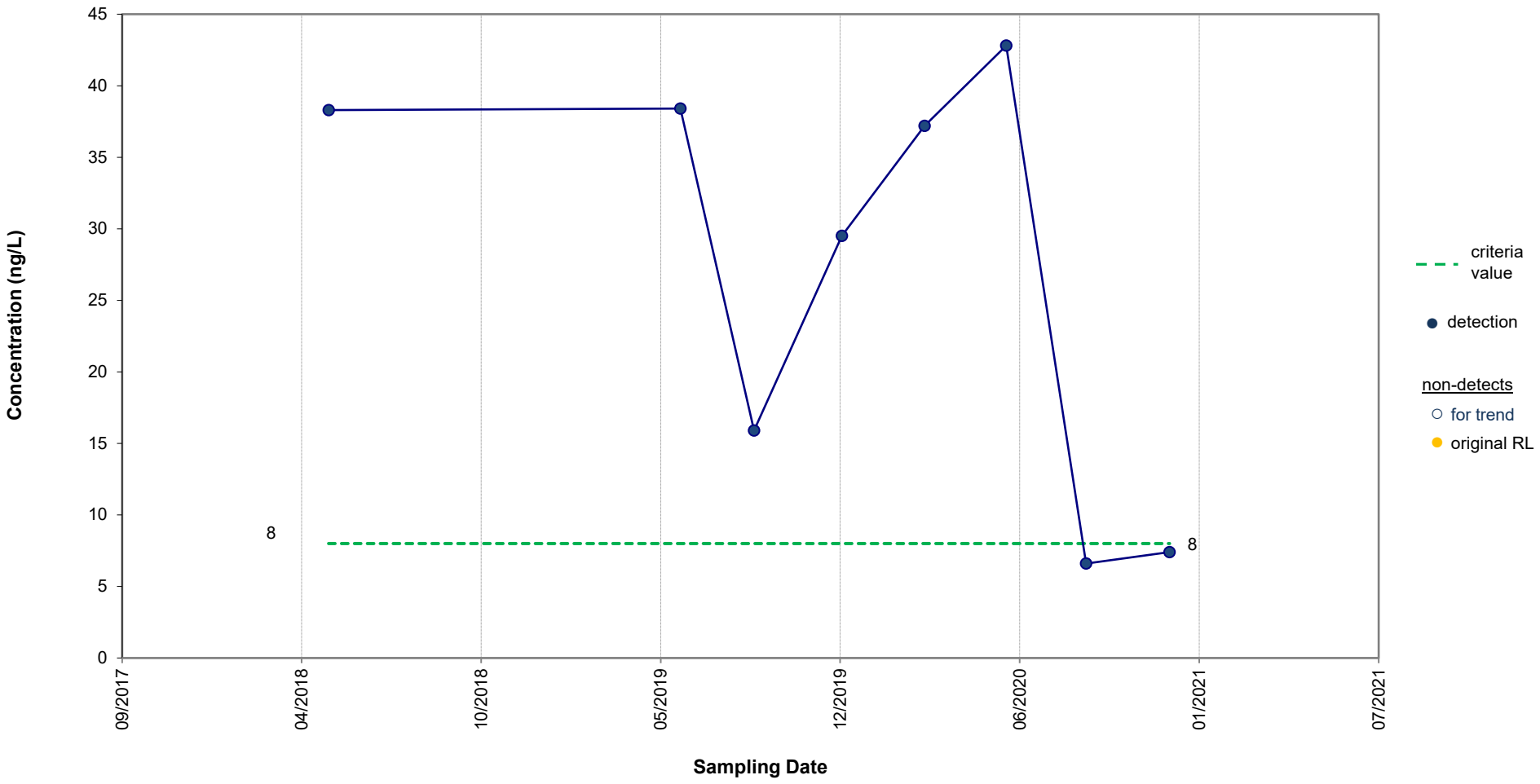
p value = 0.39 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-67, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

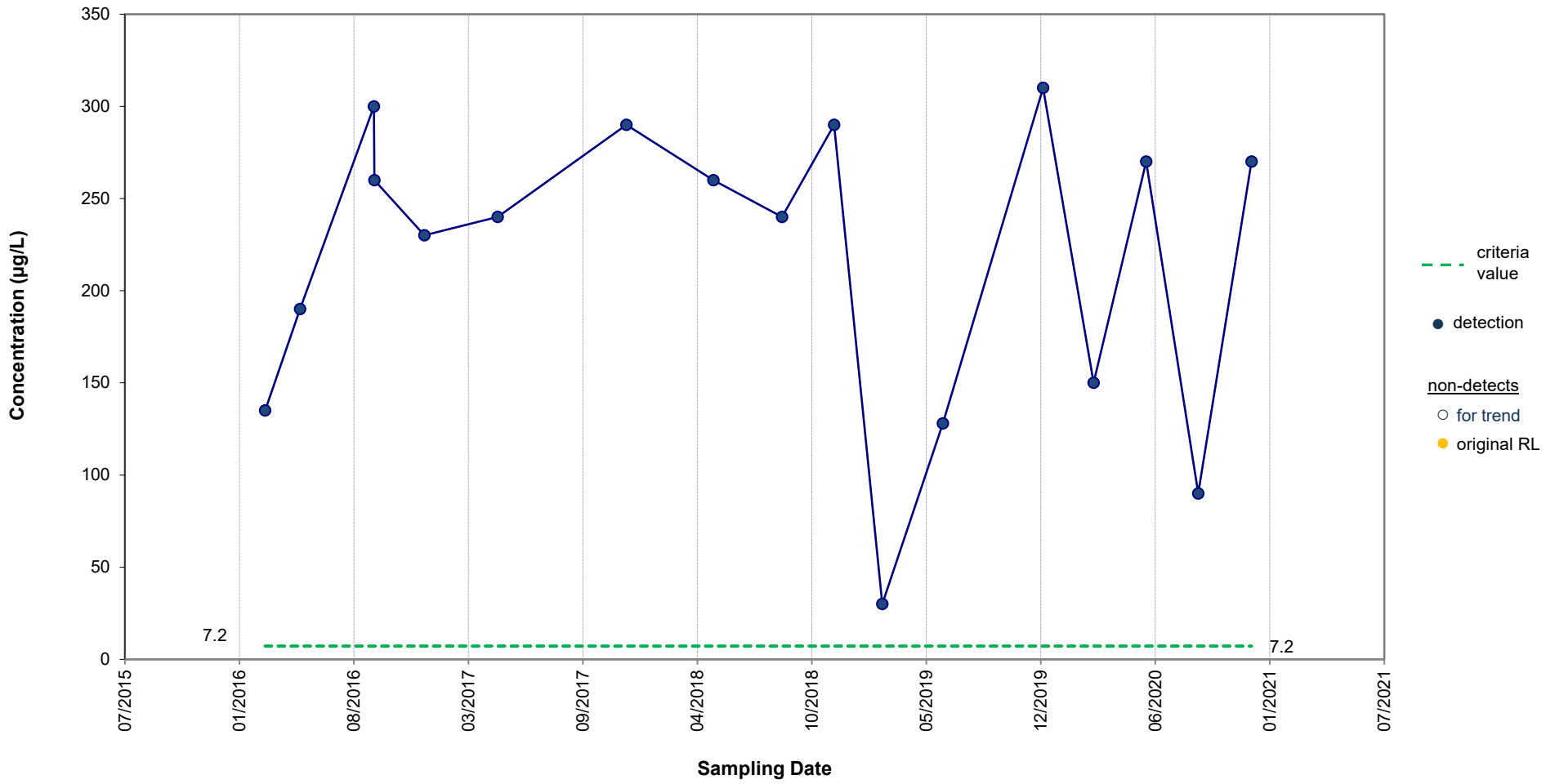
p value = 0.20 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-14-70, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

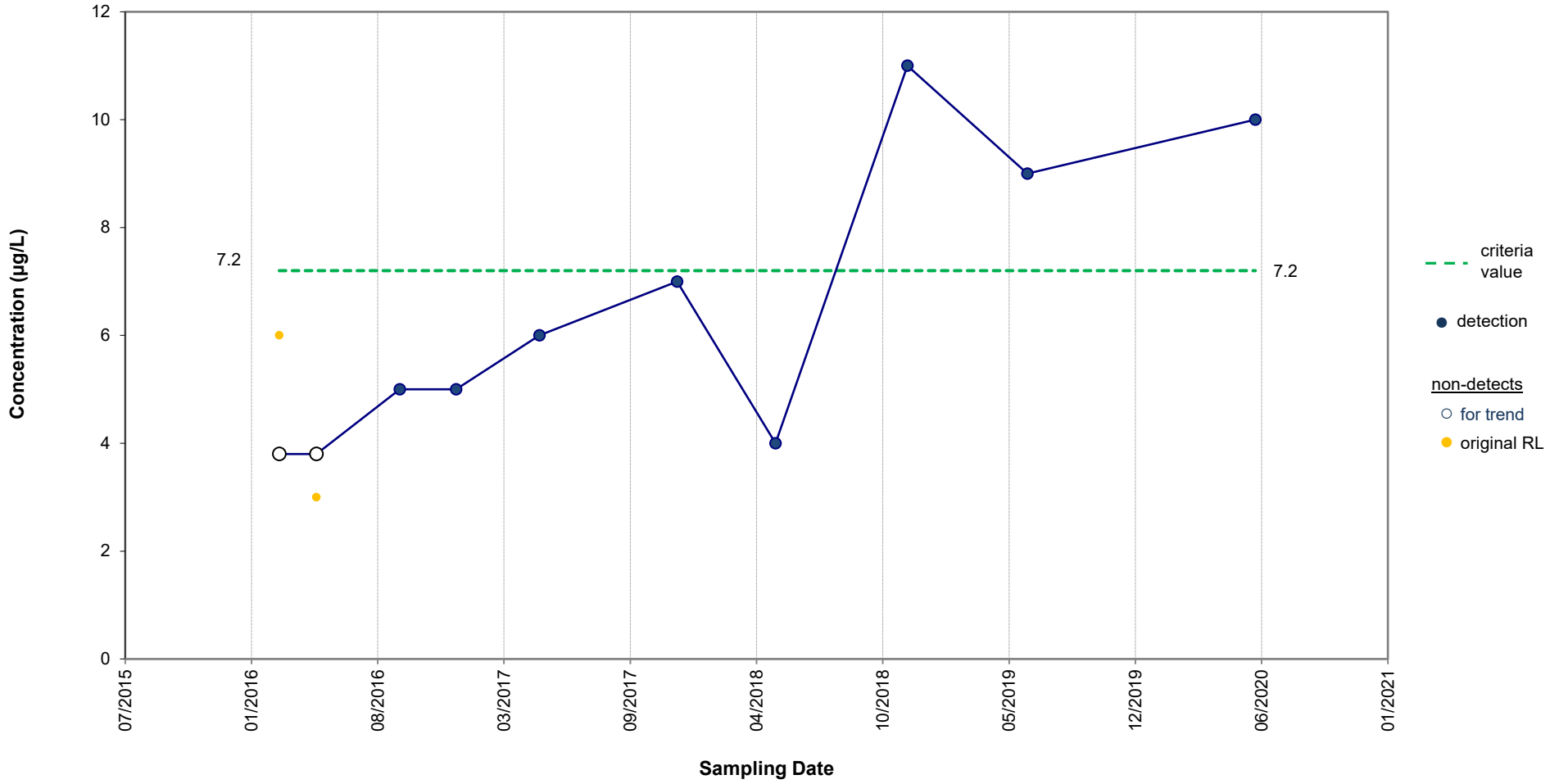
p value = 0.48 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-15-72, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

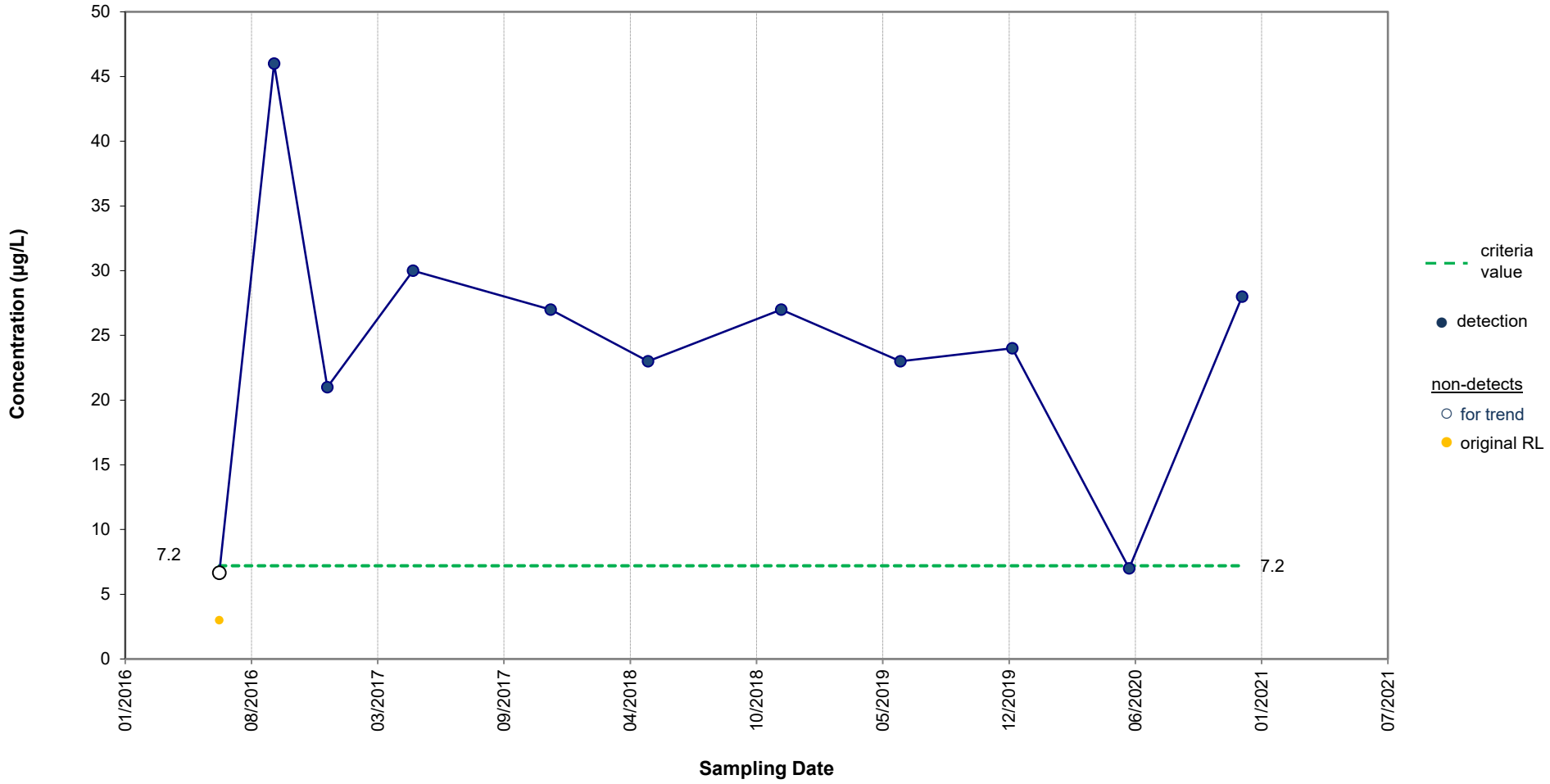
p value = 0.00 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-15-73, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

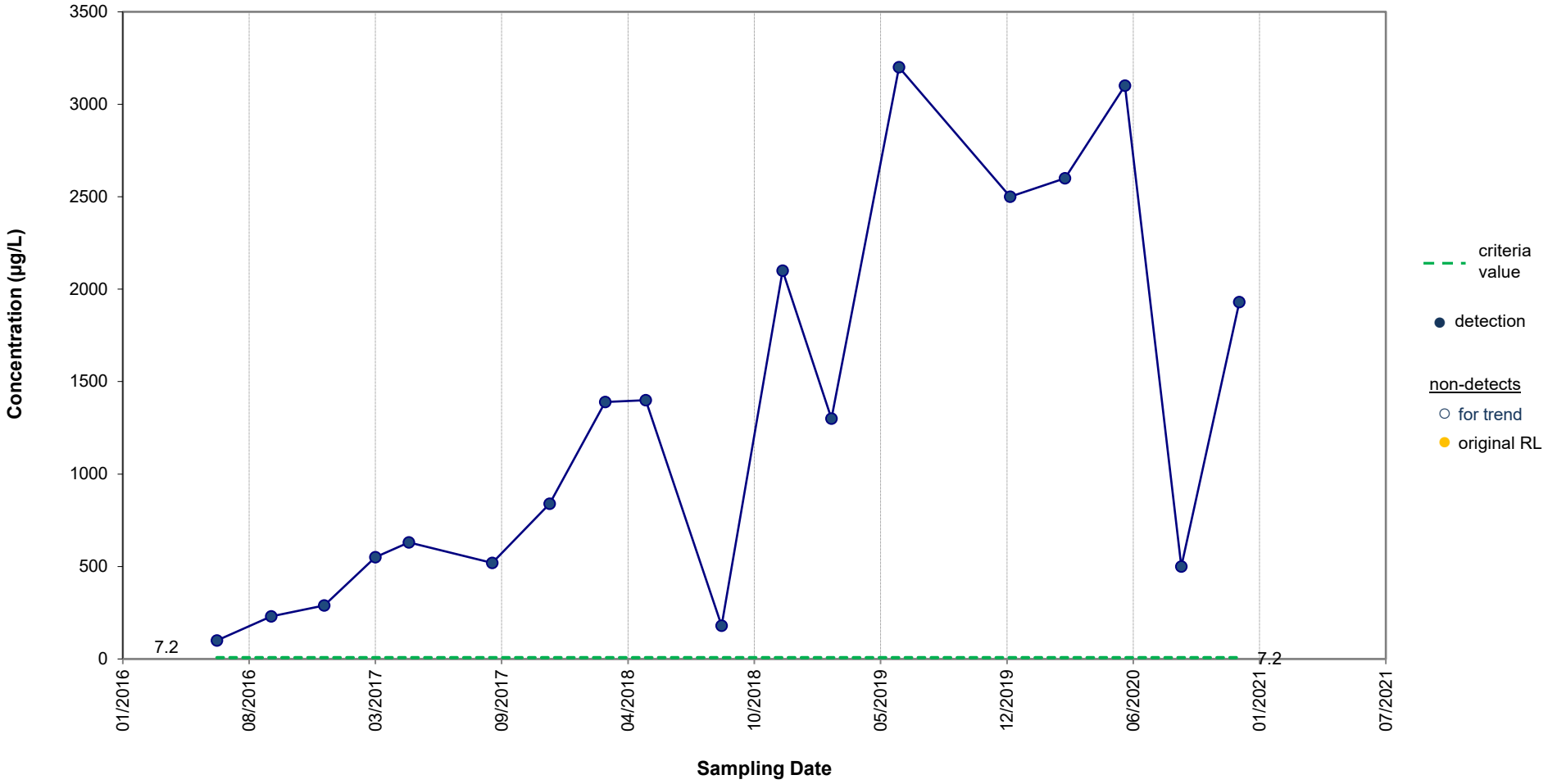
p value = 0.50 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-16-80, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

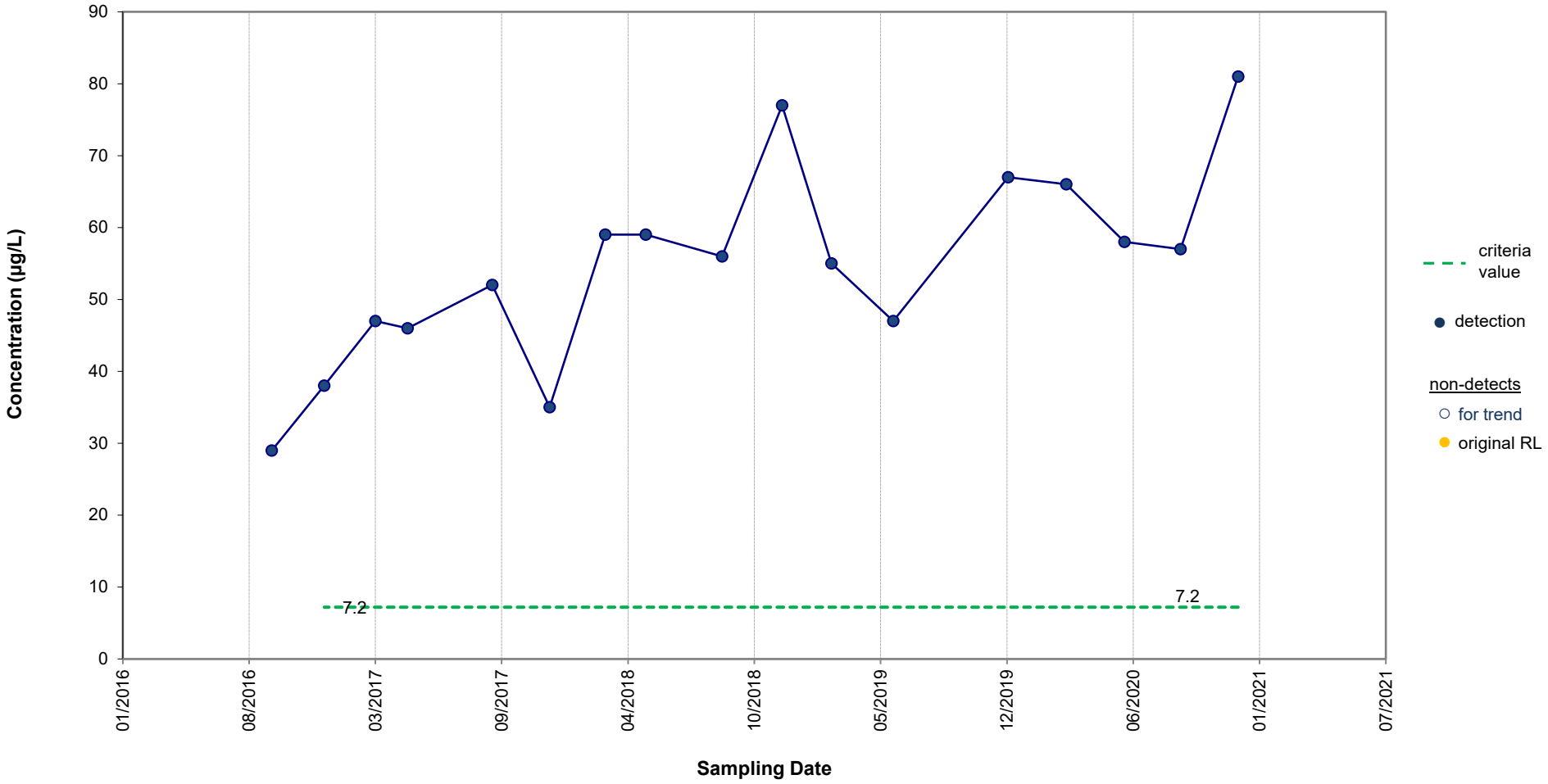
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-16-81, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

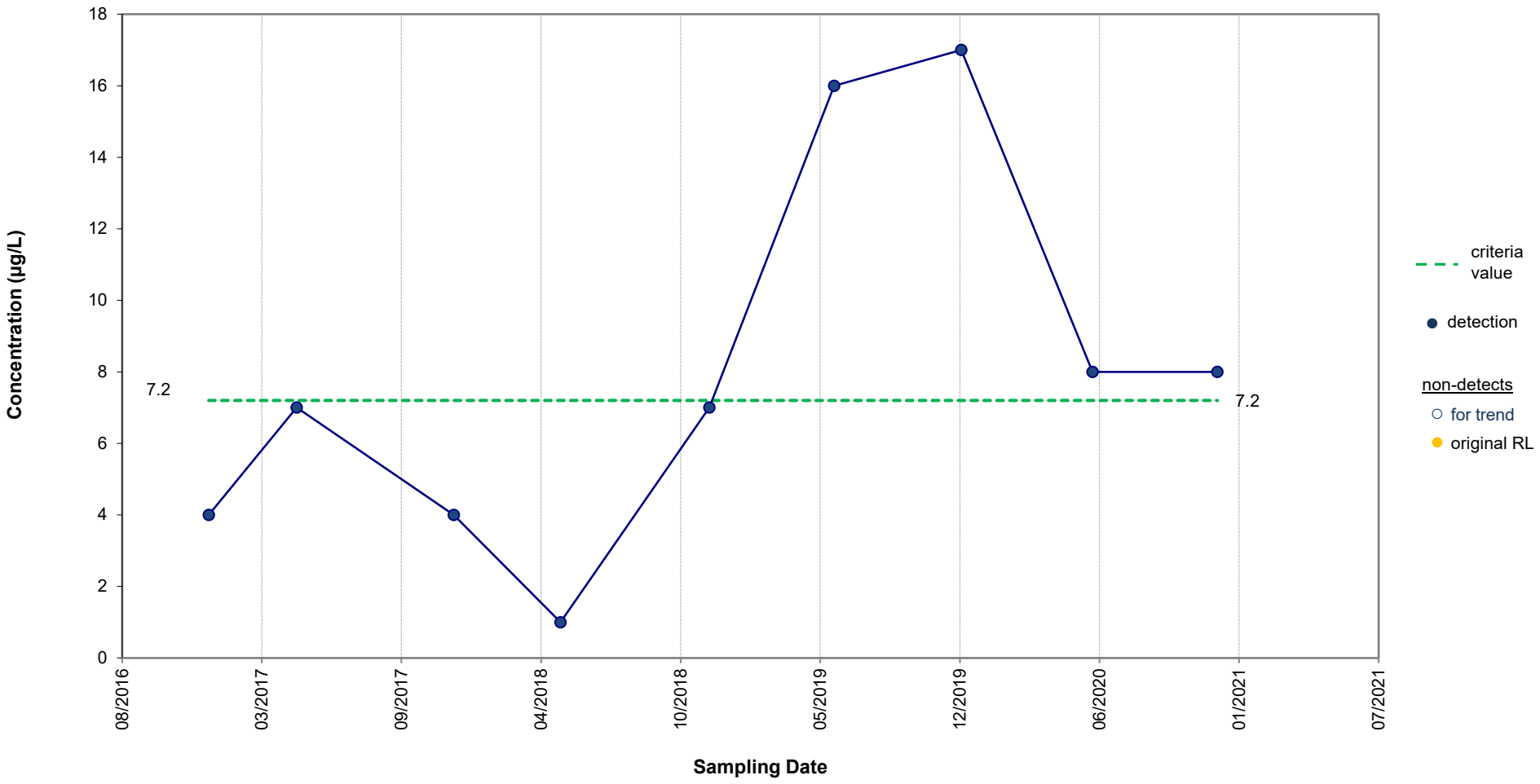
p value = 0.00 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-16-84, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

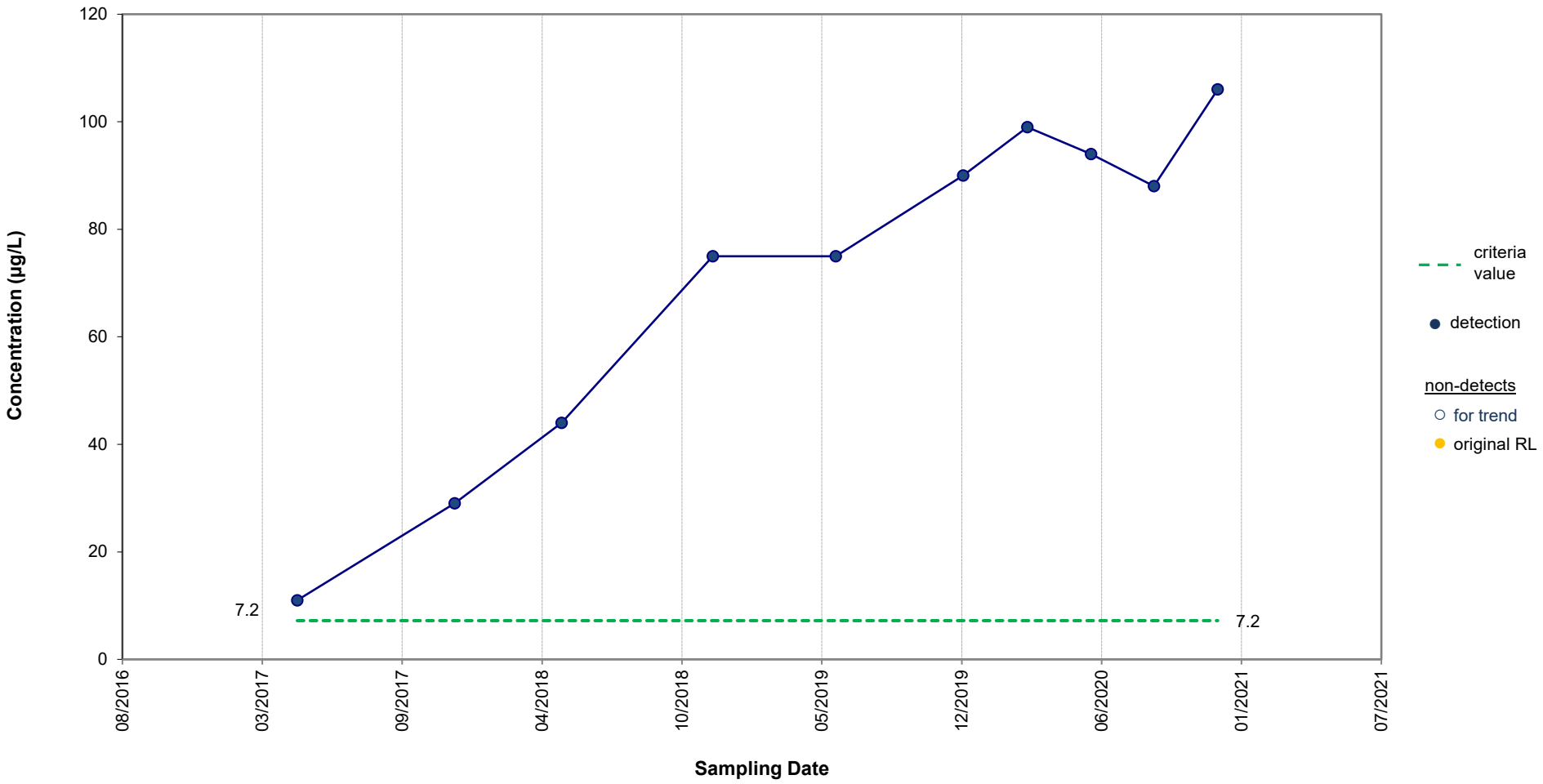
p value = 0.05 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-16-85, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

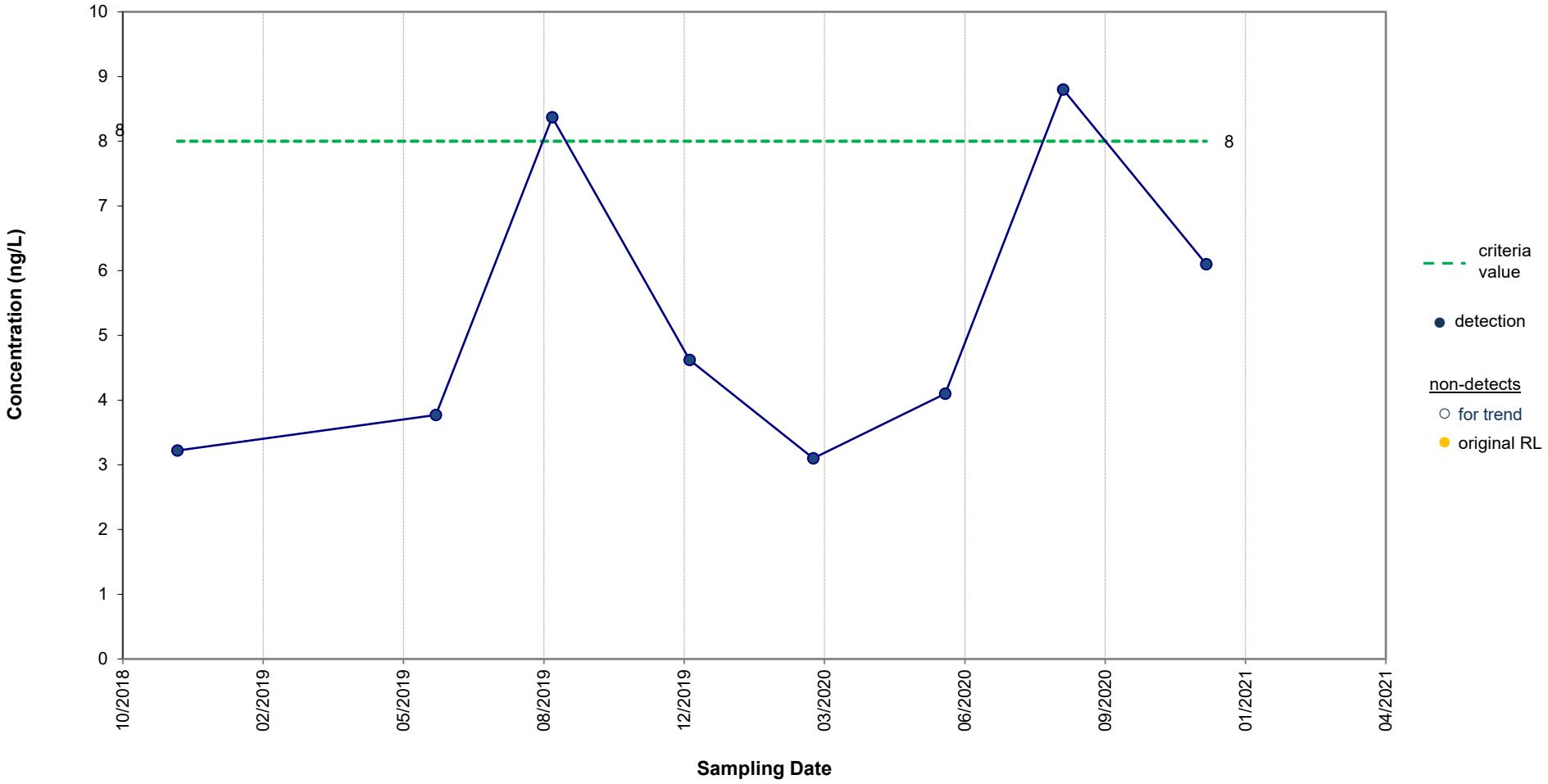
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-17-86, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

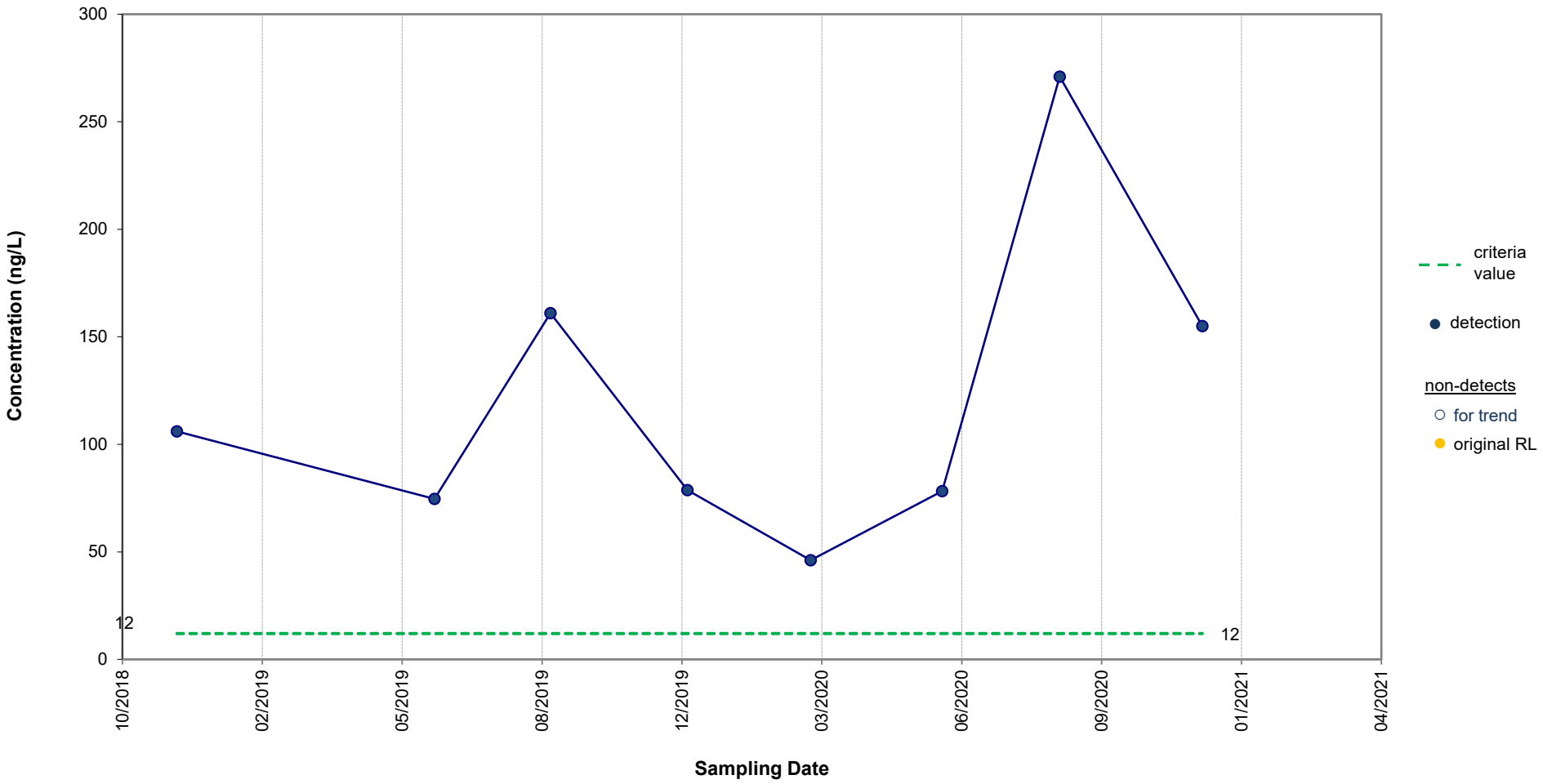
p value = 0.14 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-88, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

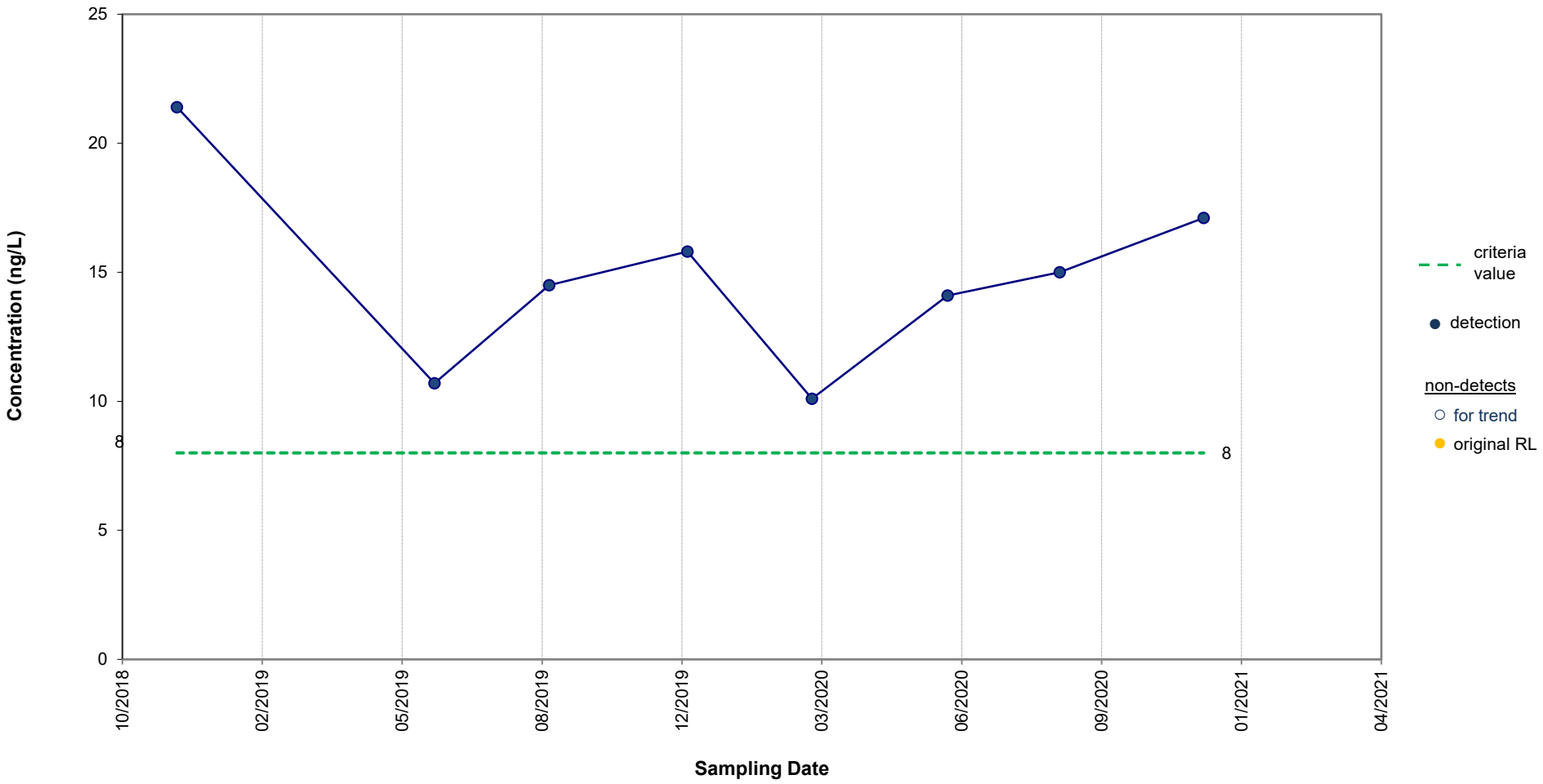
p value = 0.36 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-88, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

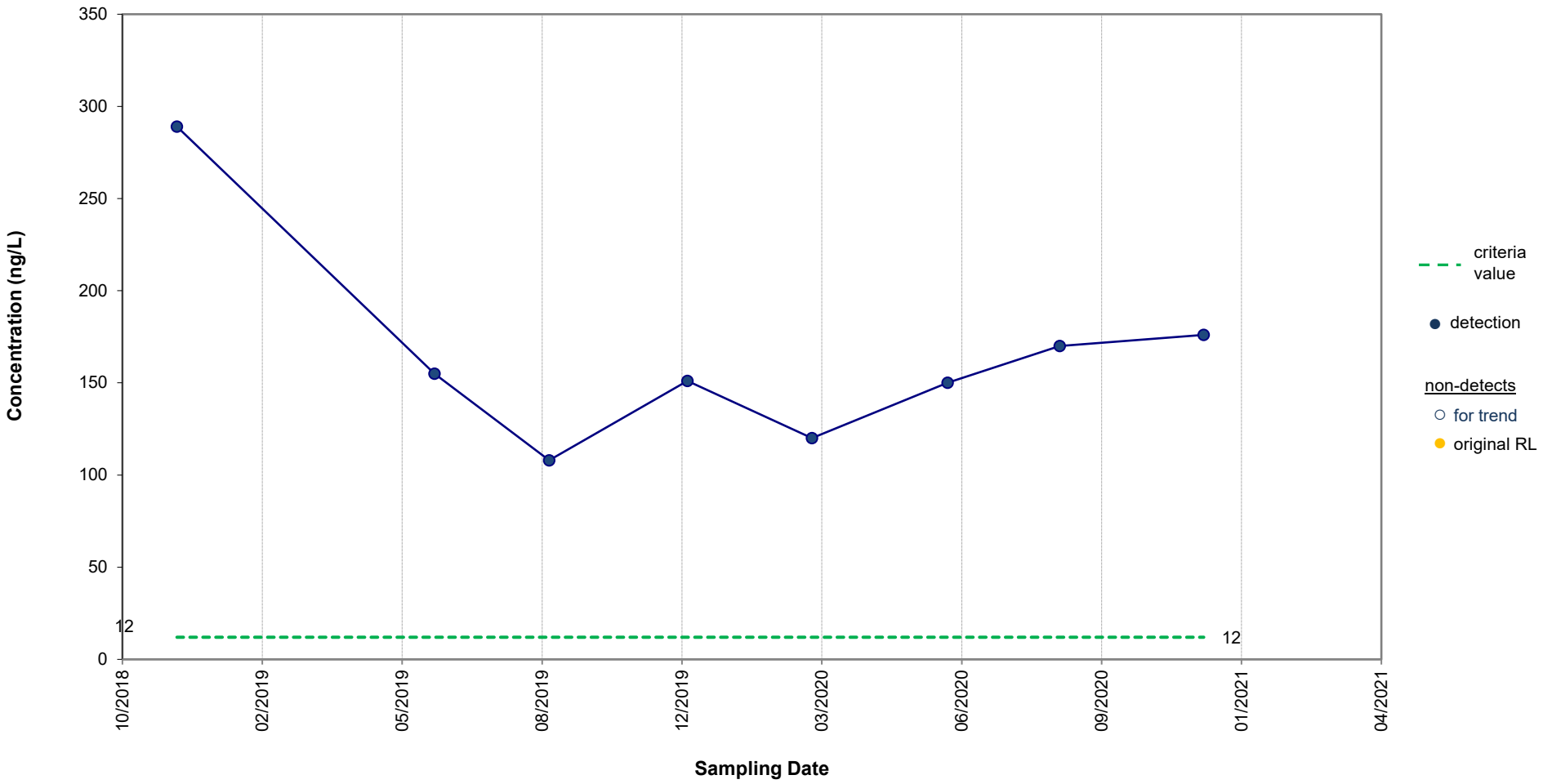
p value = 0.45 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-89, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

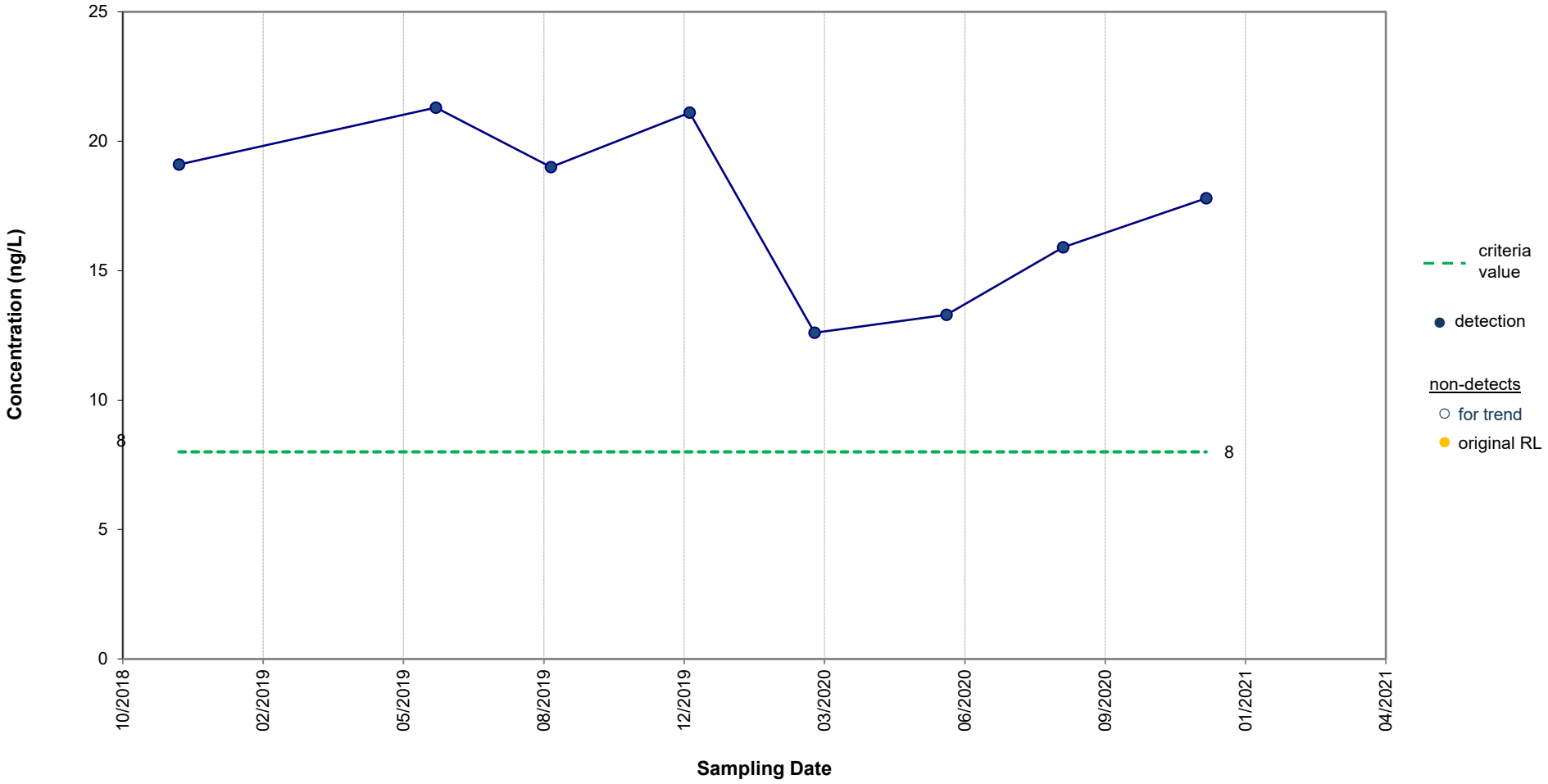
p value = 0.45 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-89, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

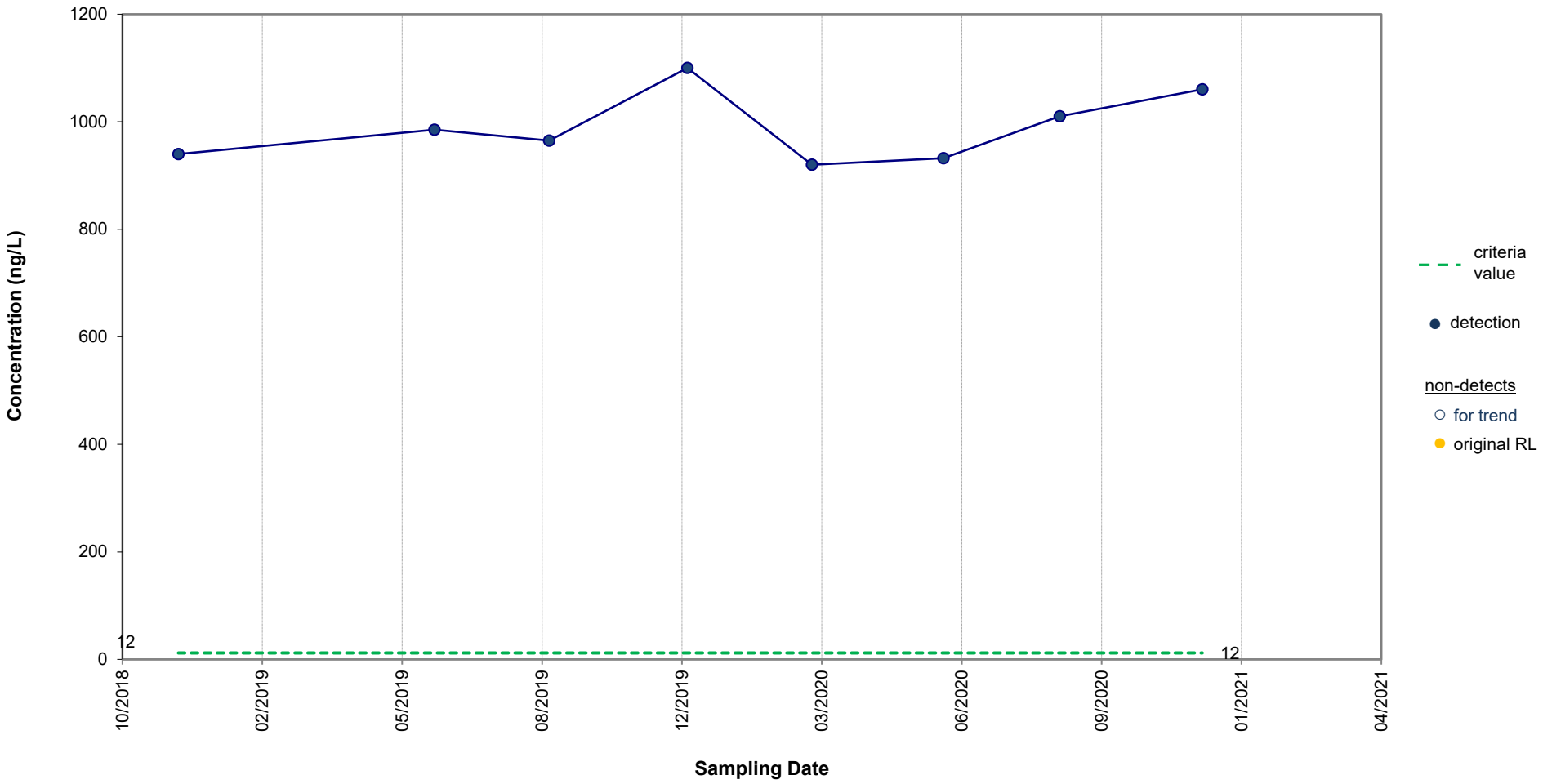
p value = 0.14 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-90, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

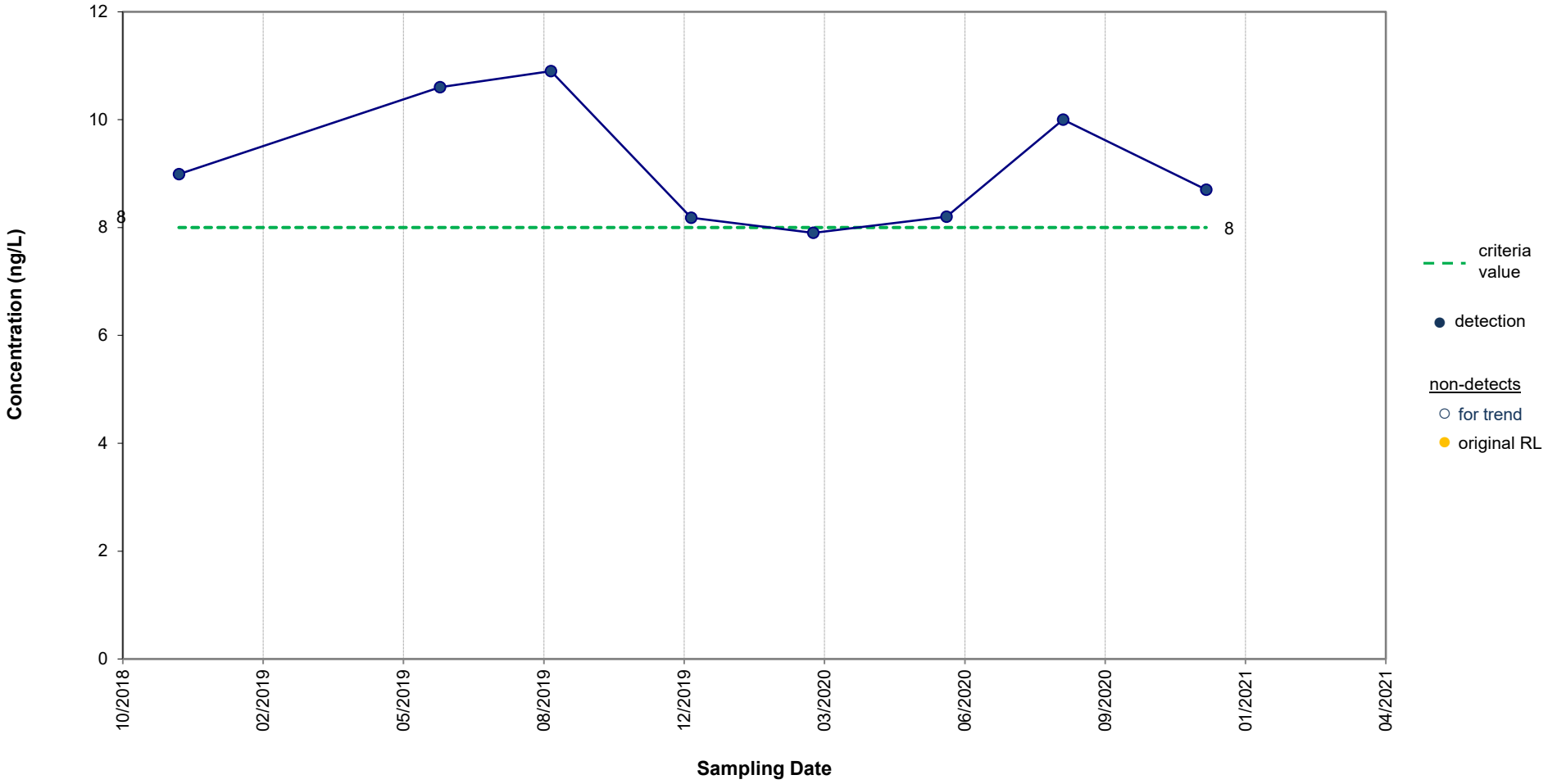
p value = 0.27 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-90, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

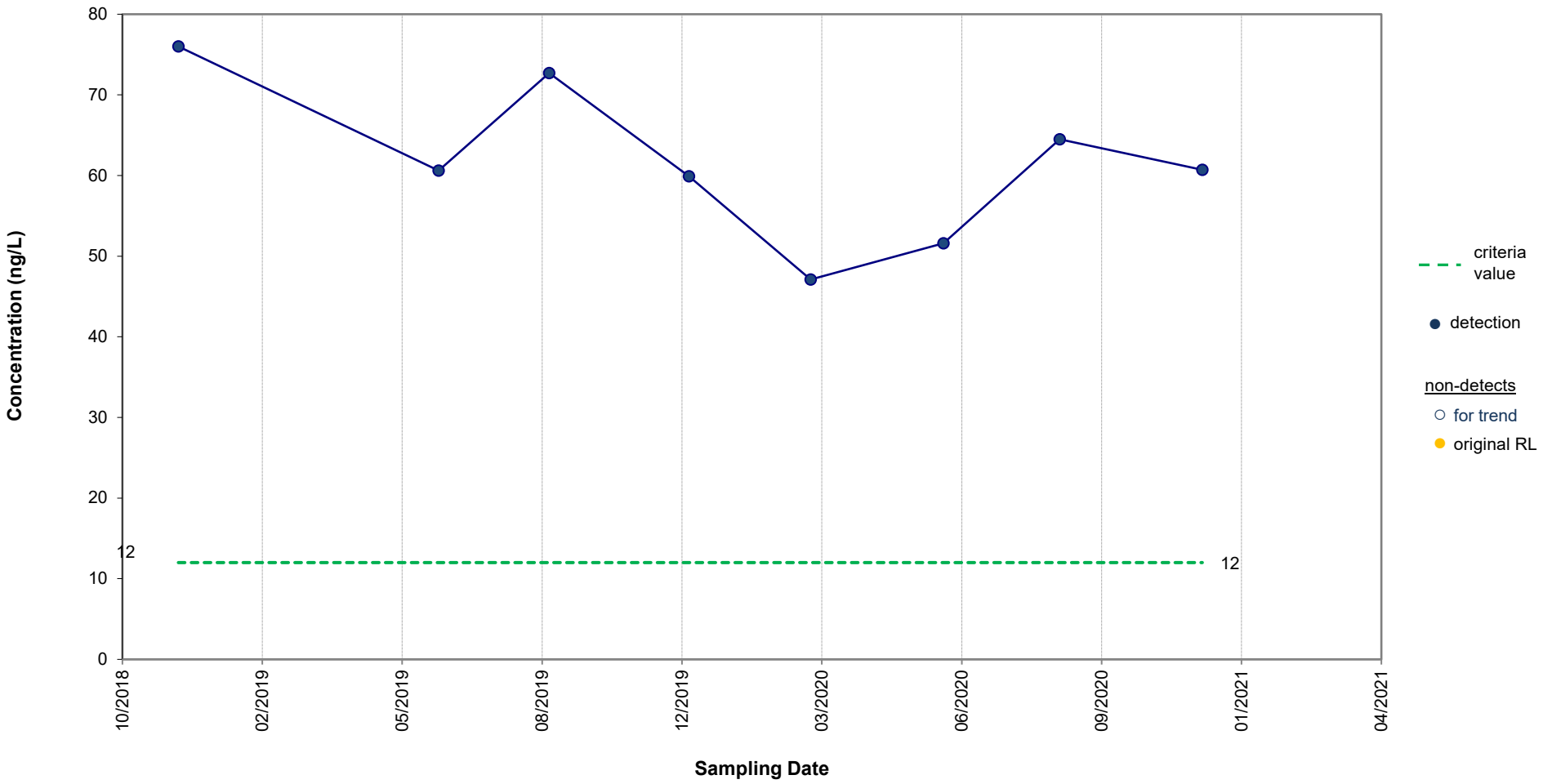
p value = 0.36 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-91, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

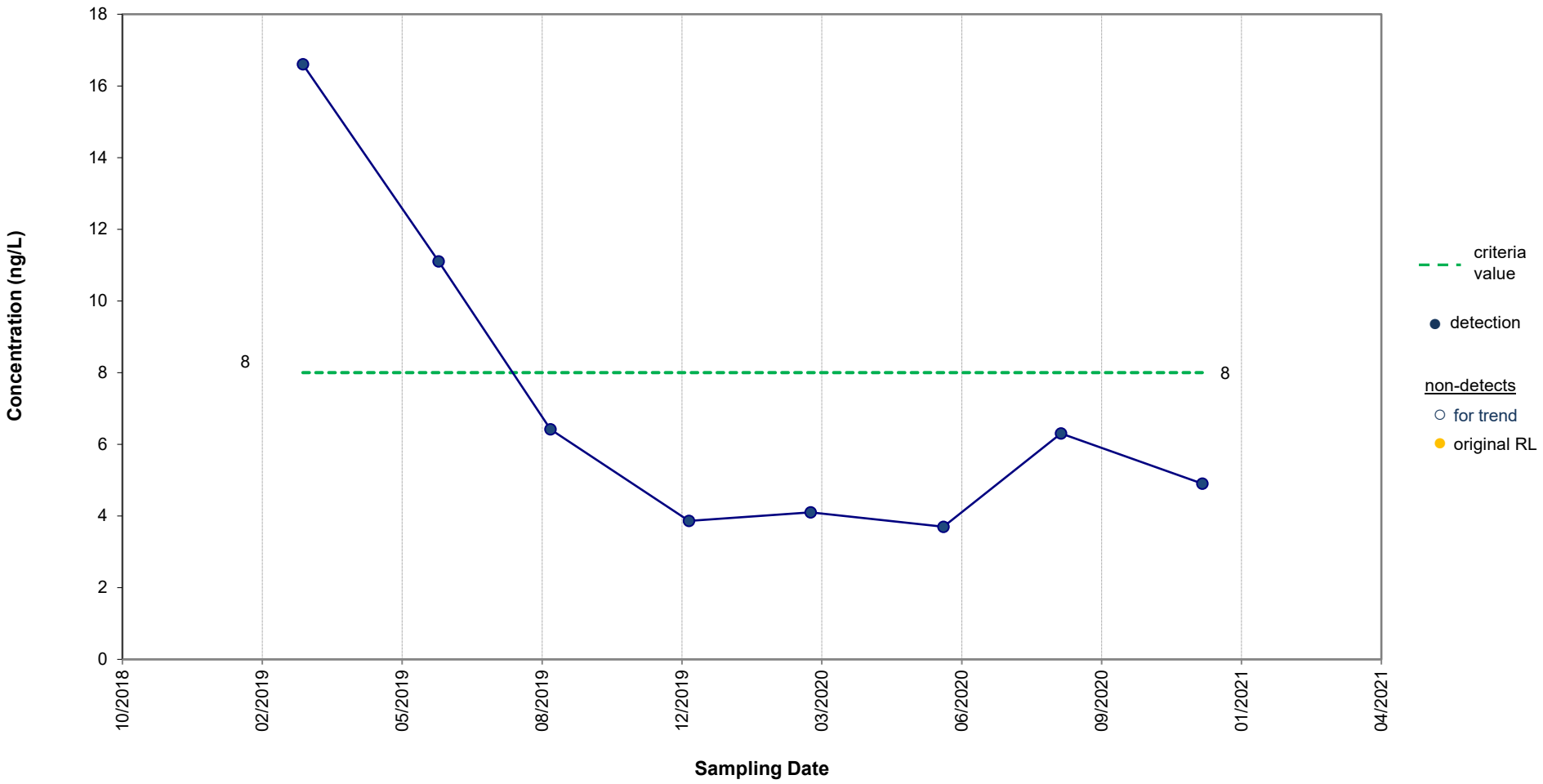
p value = 0.20 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-91, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

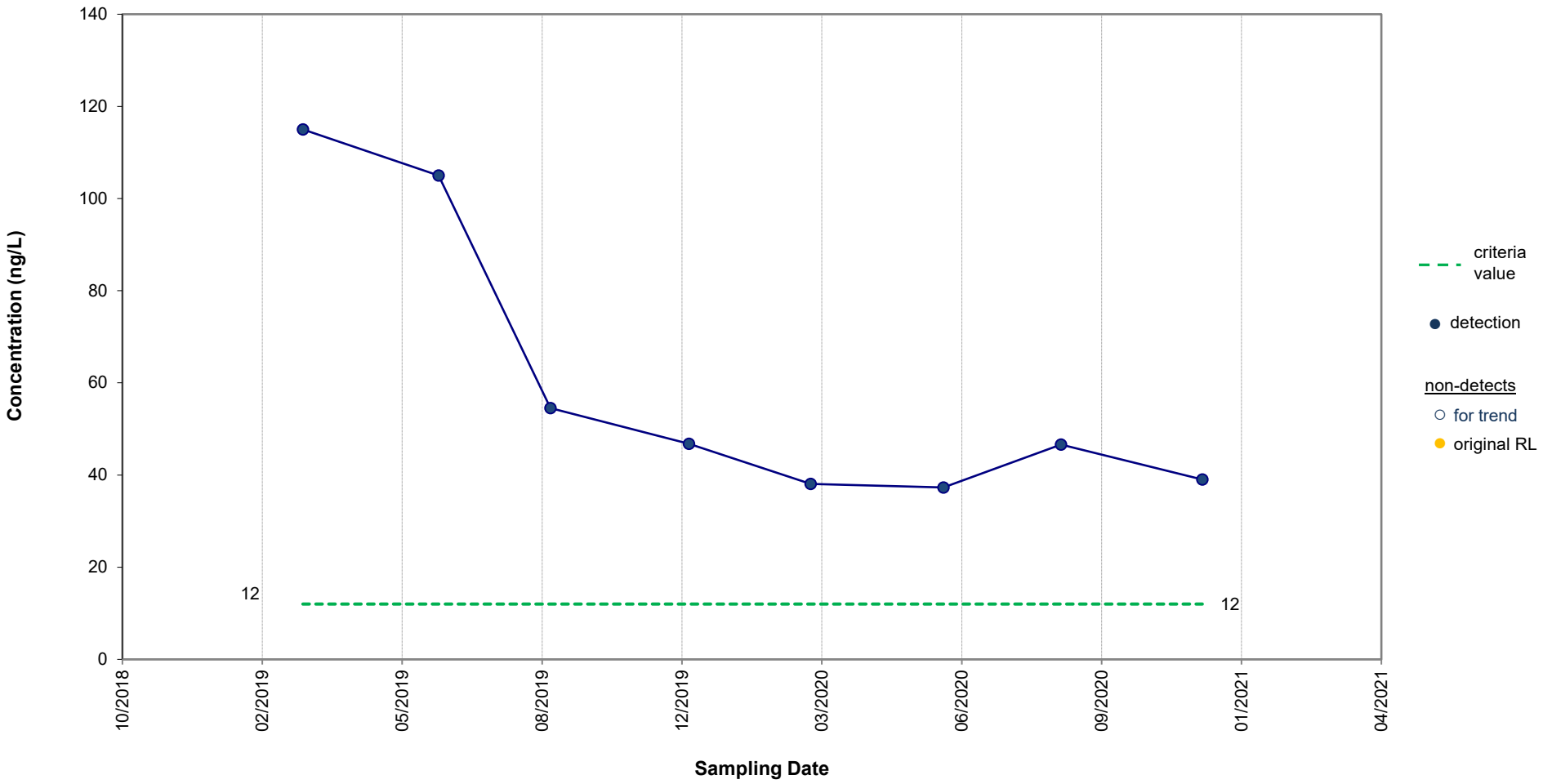
p value = 0.05 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-95, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

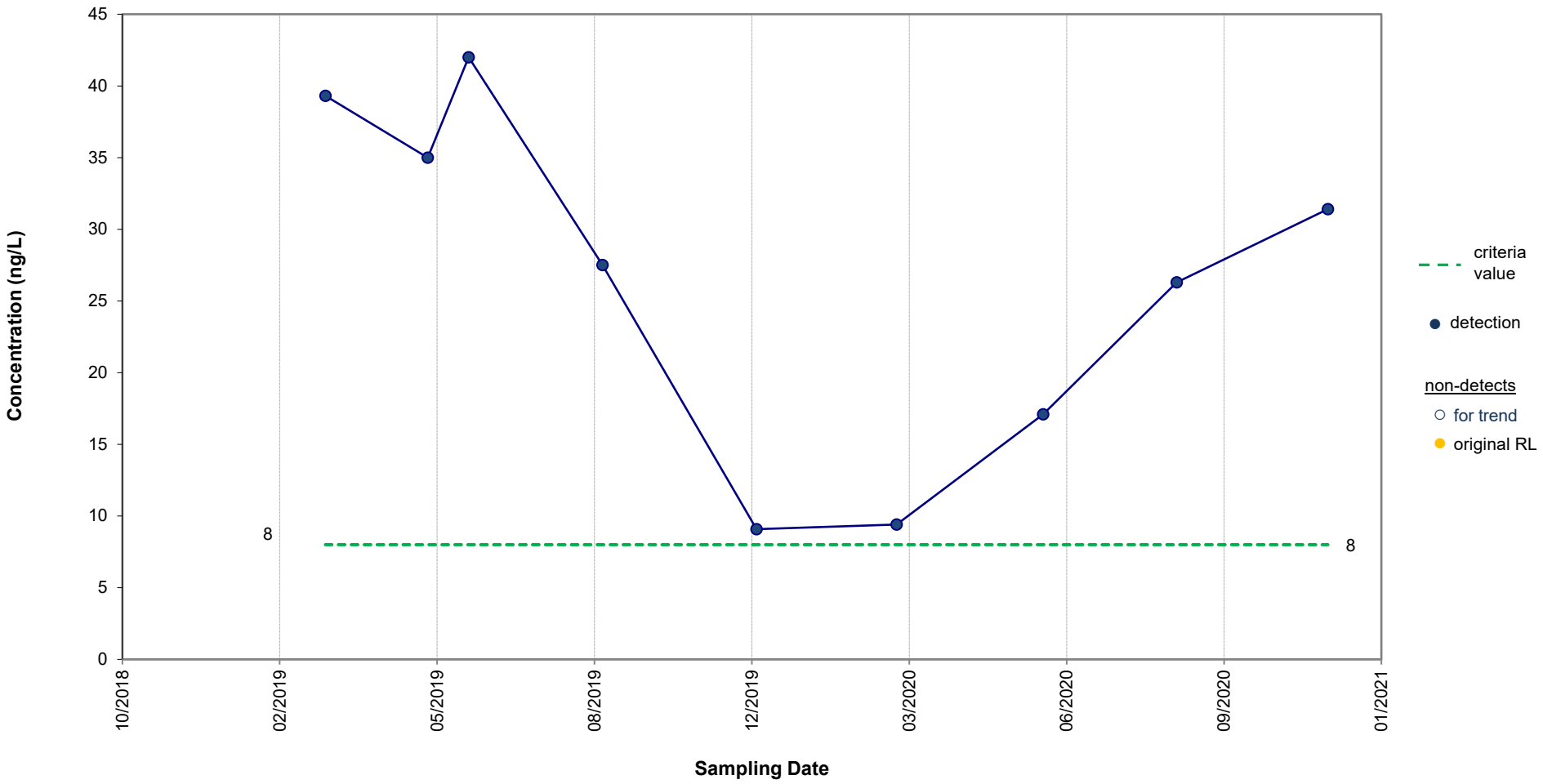
p value = 0.01 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-95, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

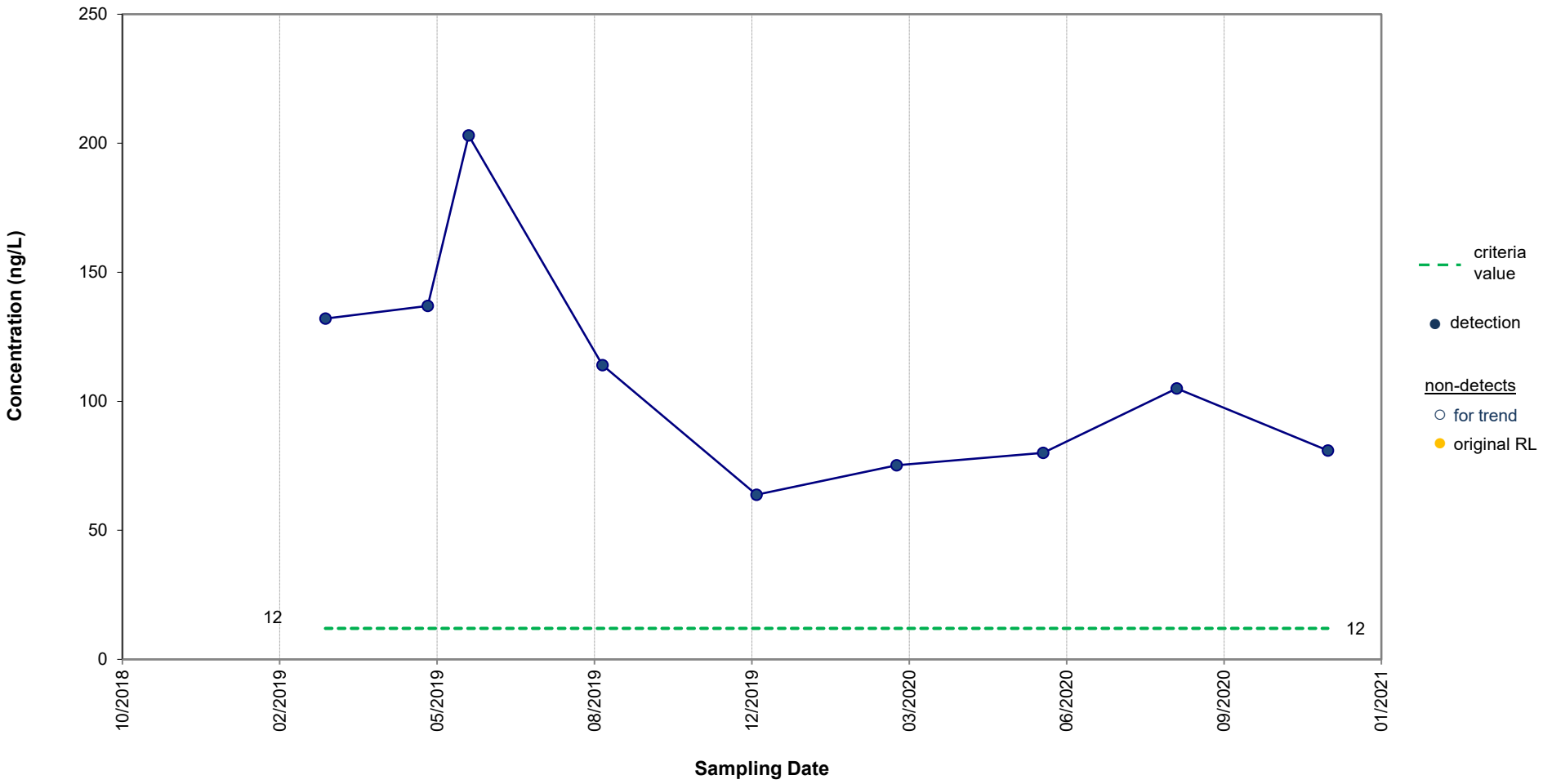
p value = 0.18 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-98, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

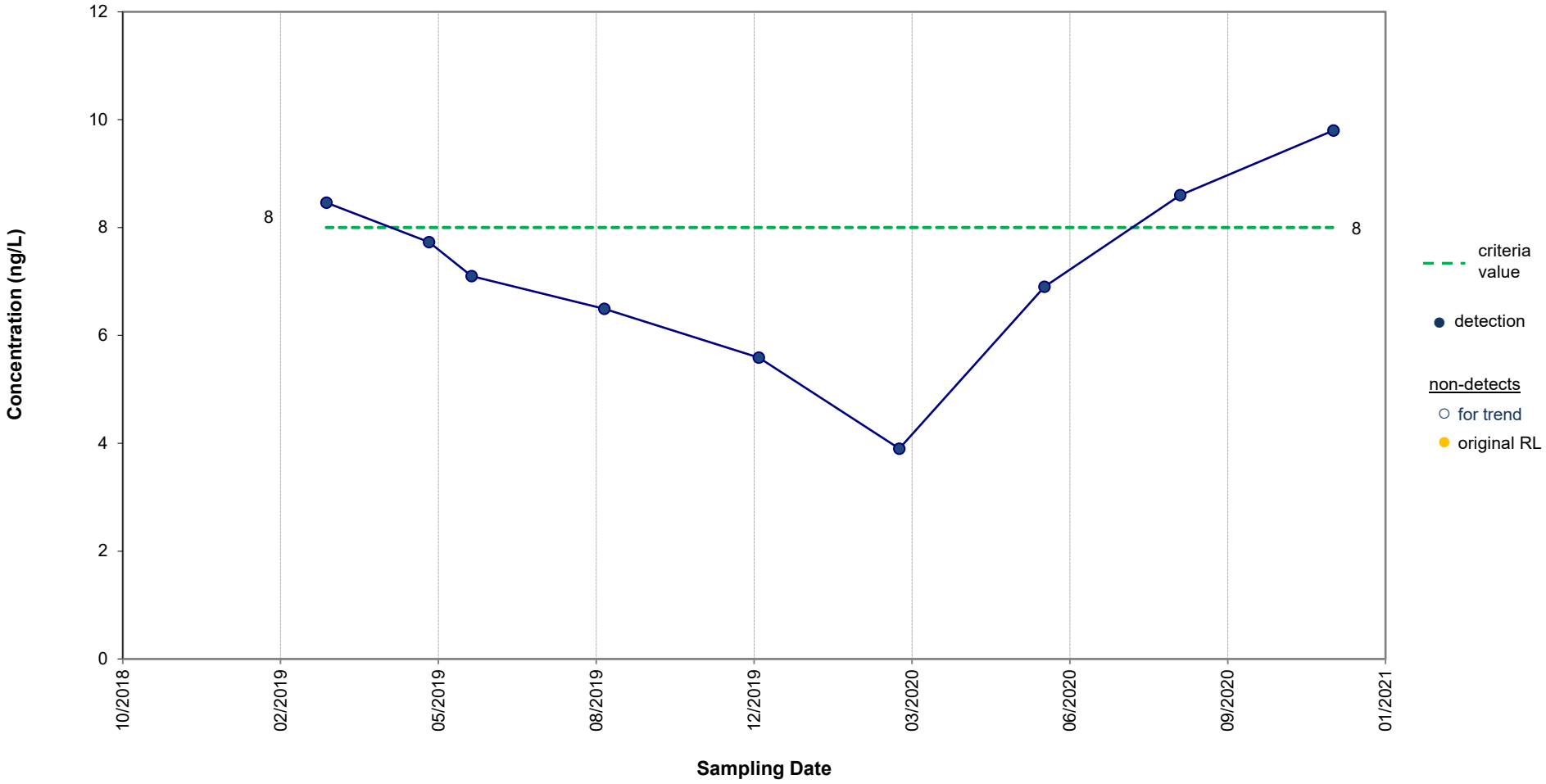
p value = 0.13 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-98, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

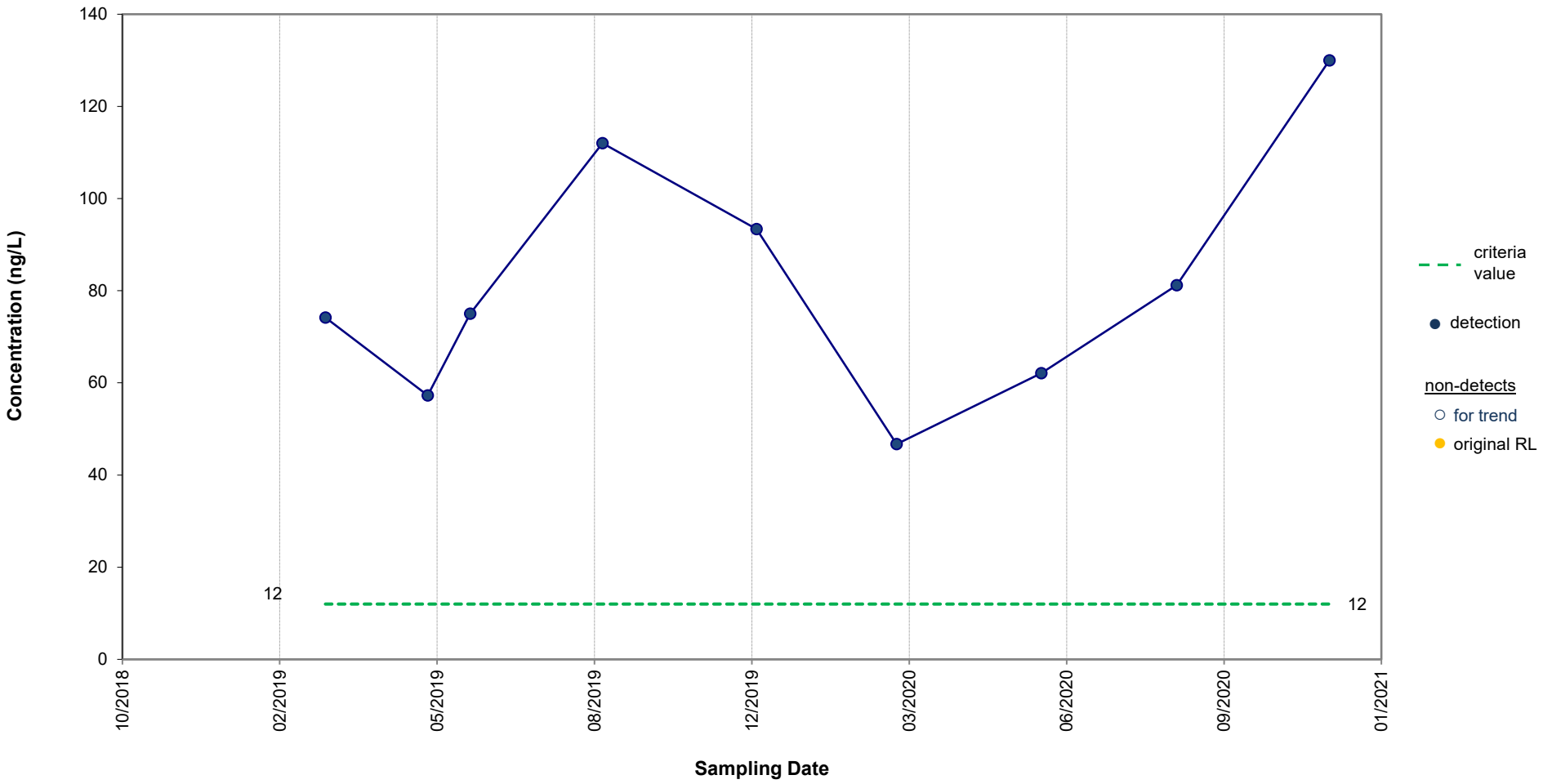
p value = 0.54 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-99, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

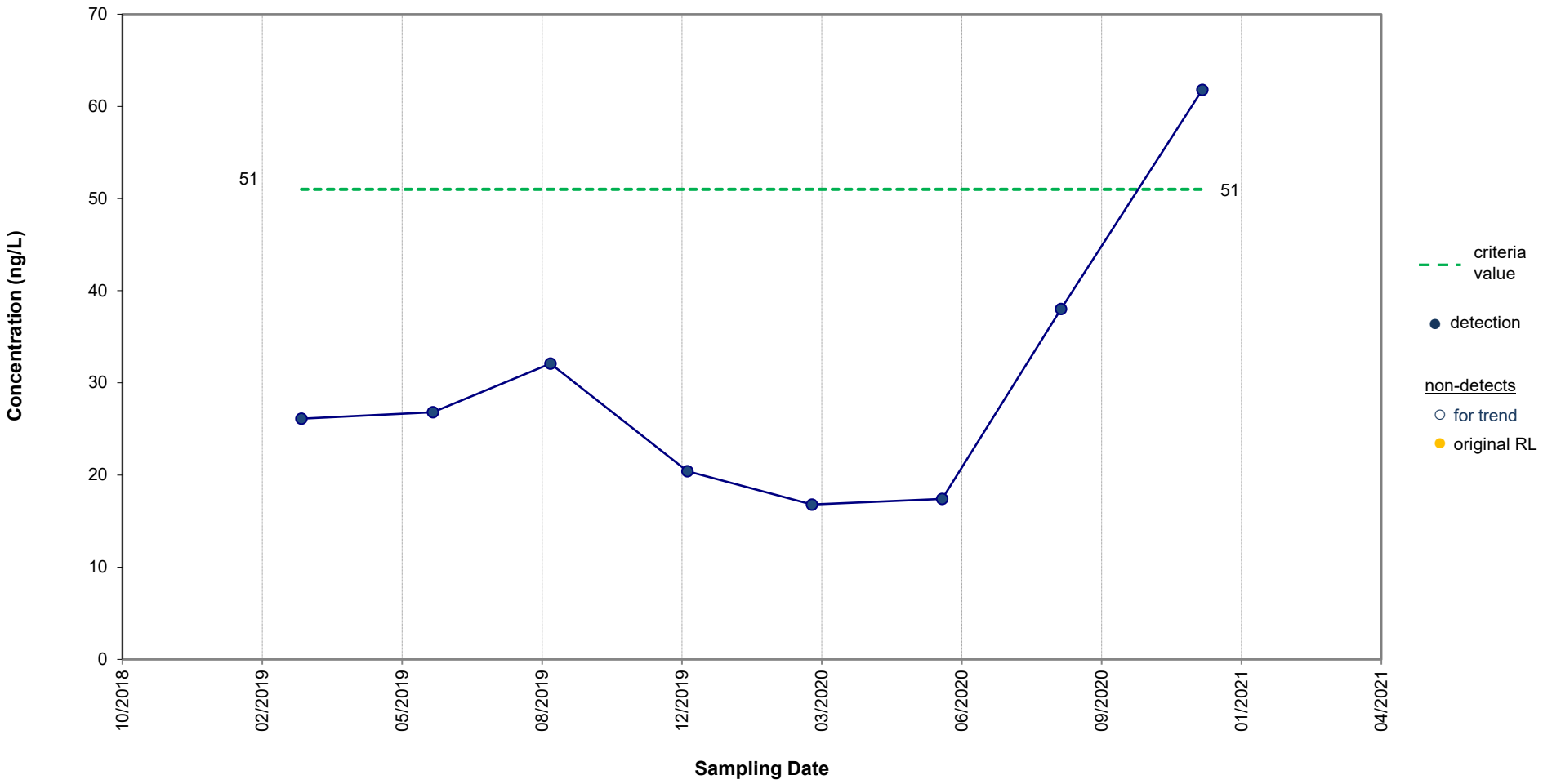
p value = 0.18 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-99, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

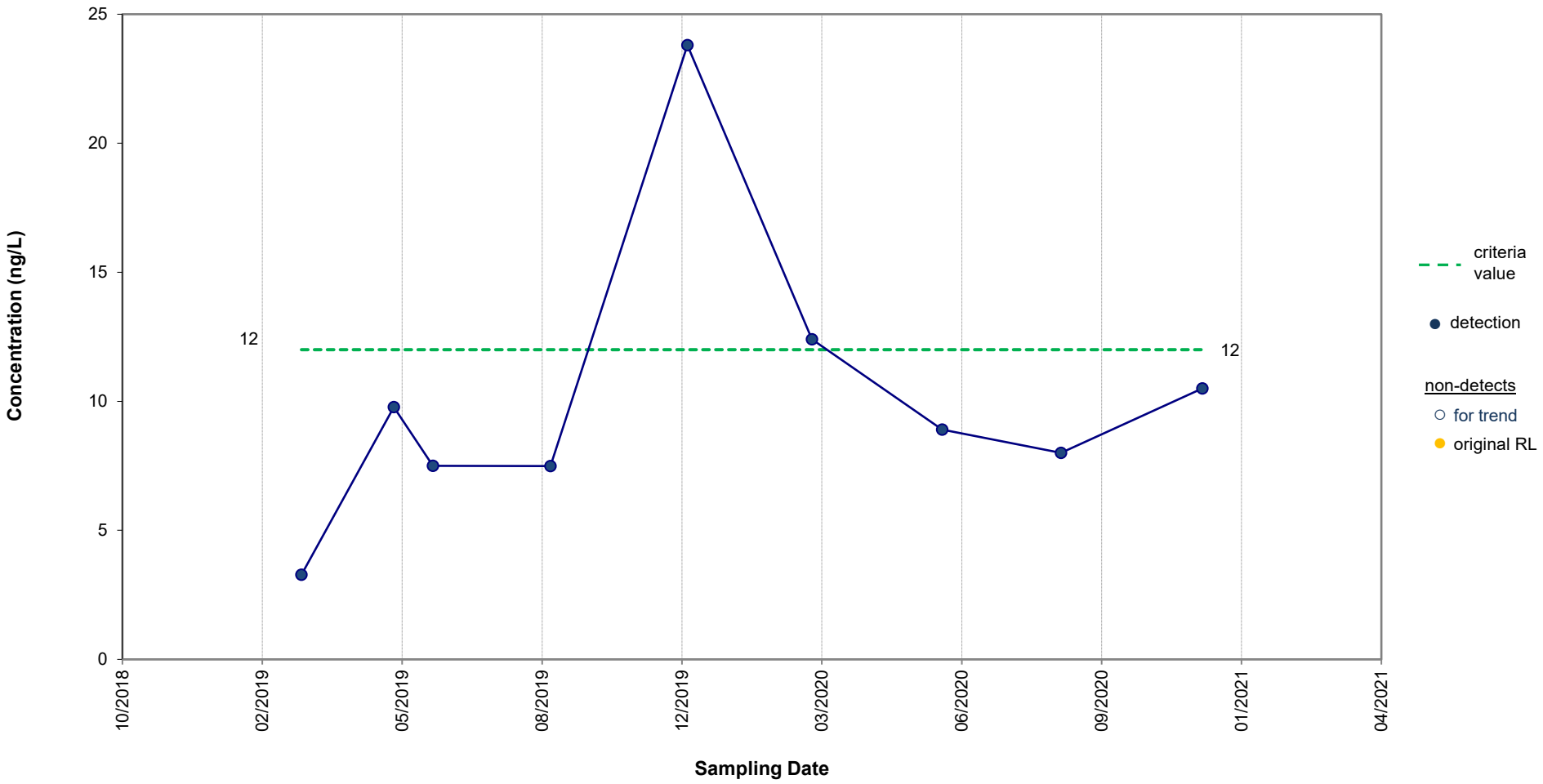
p value = 0.27 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-103, PFHxS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

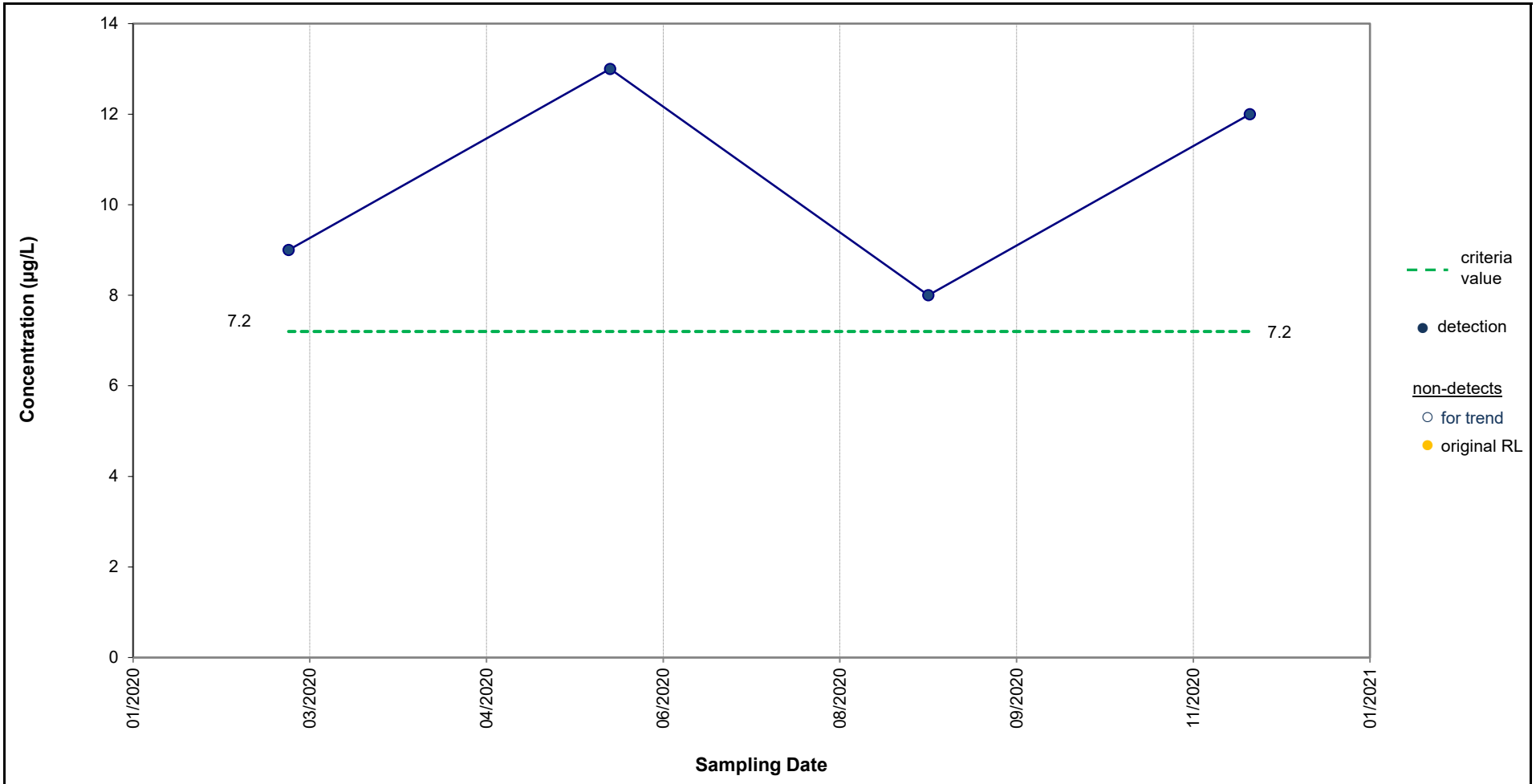
p value = 0.18 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-18-105, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

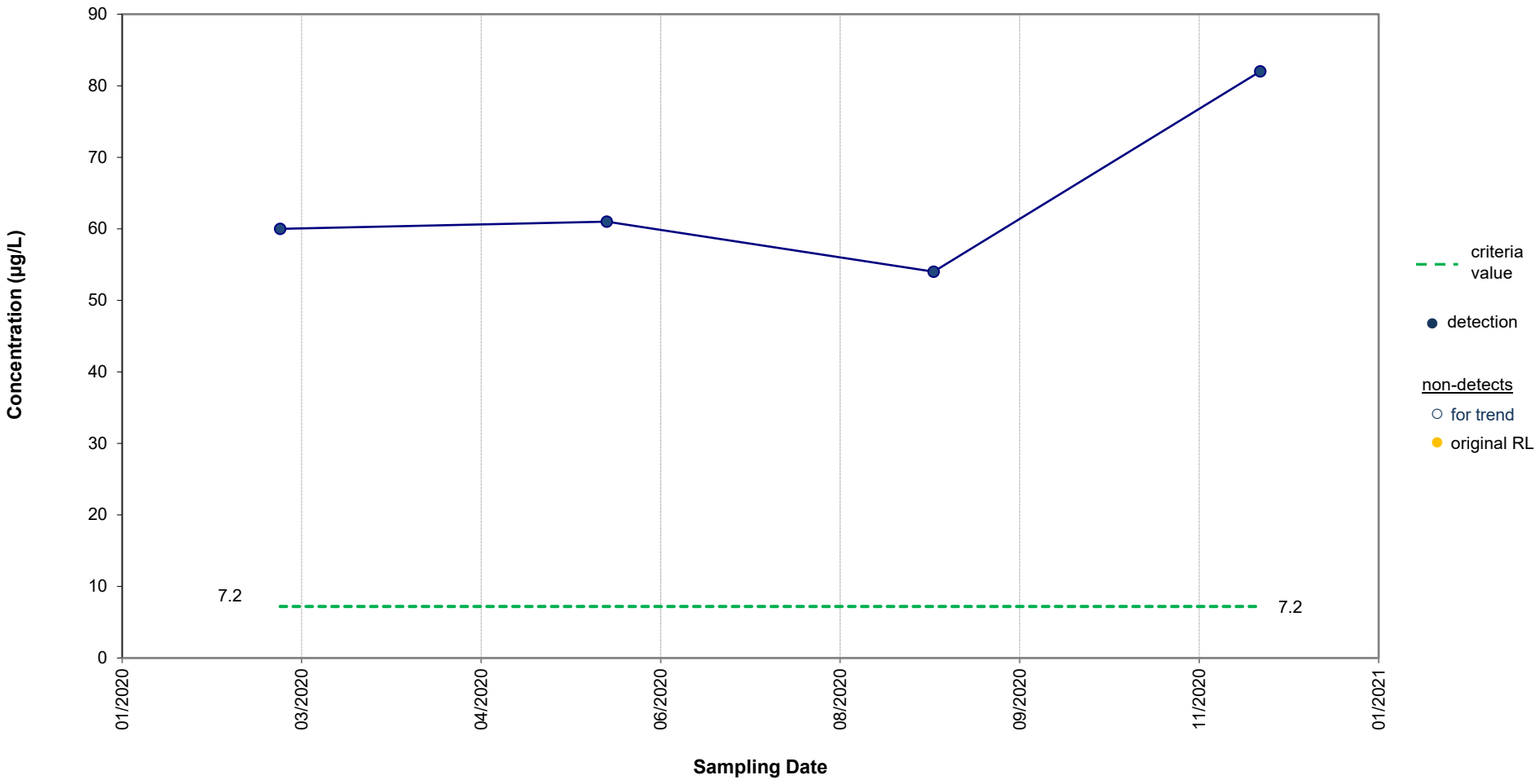
p value = 0.63 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-19-115, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

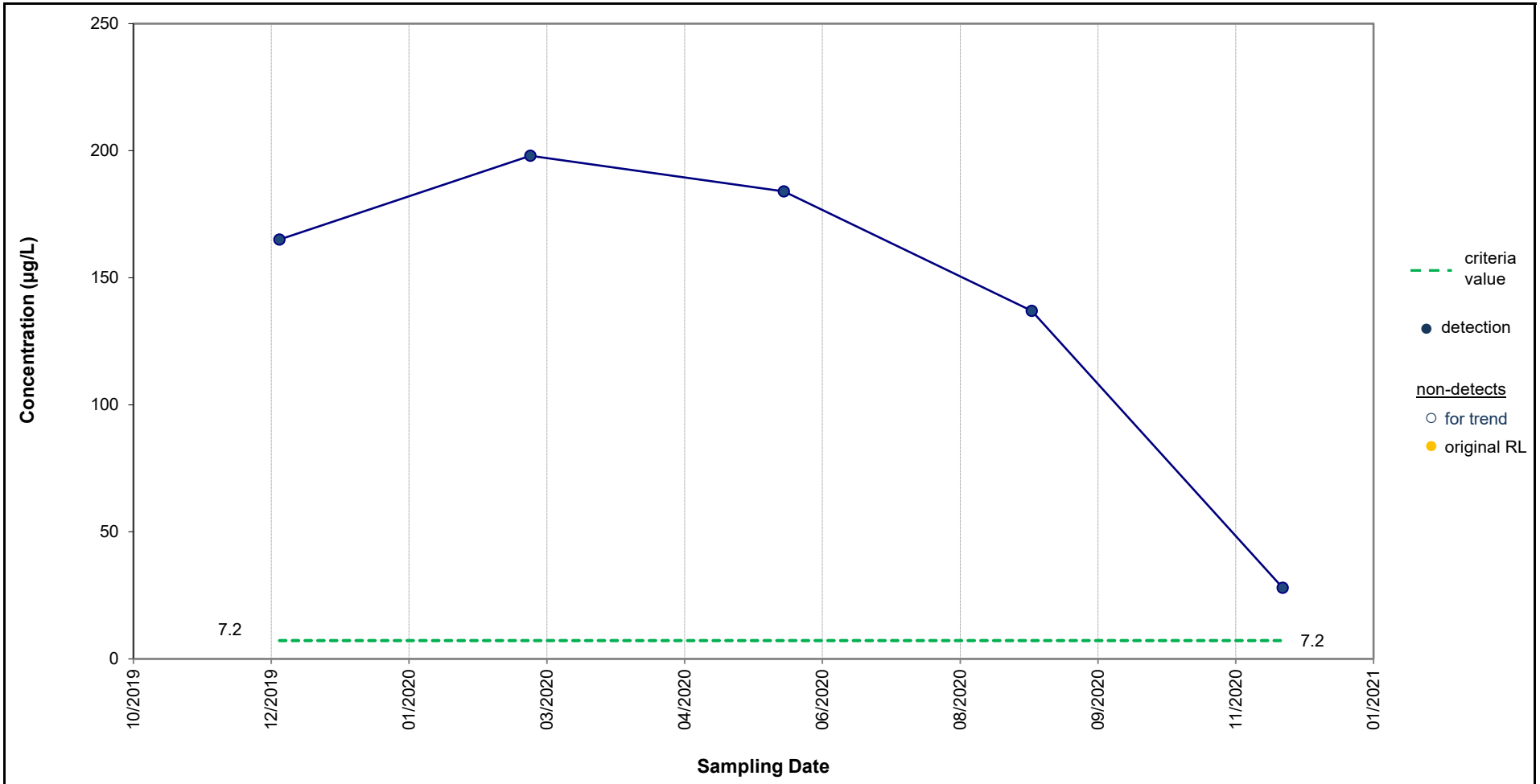
p value = 0.38 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-19-116, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

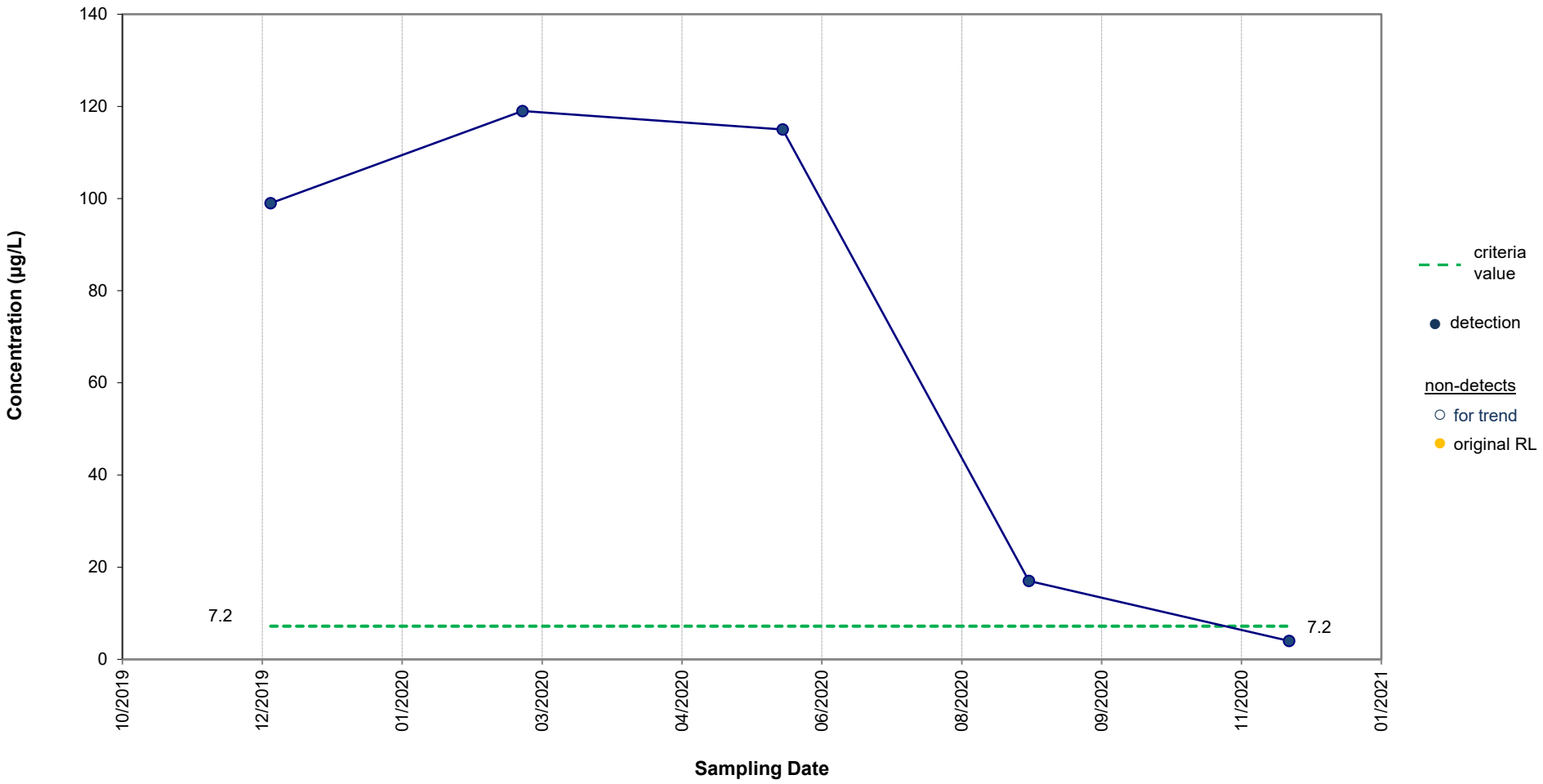
p value = 0.12 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-19-120, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

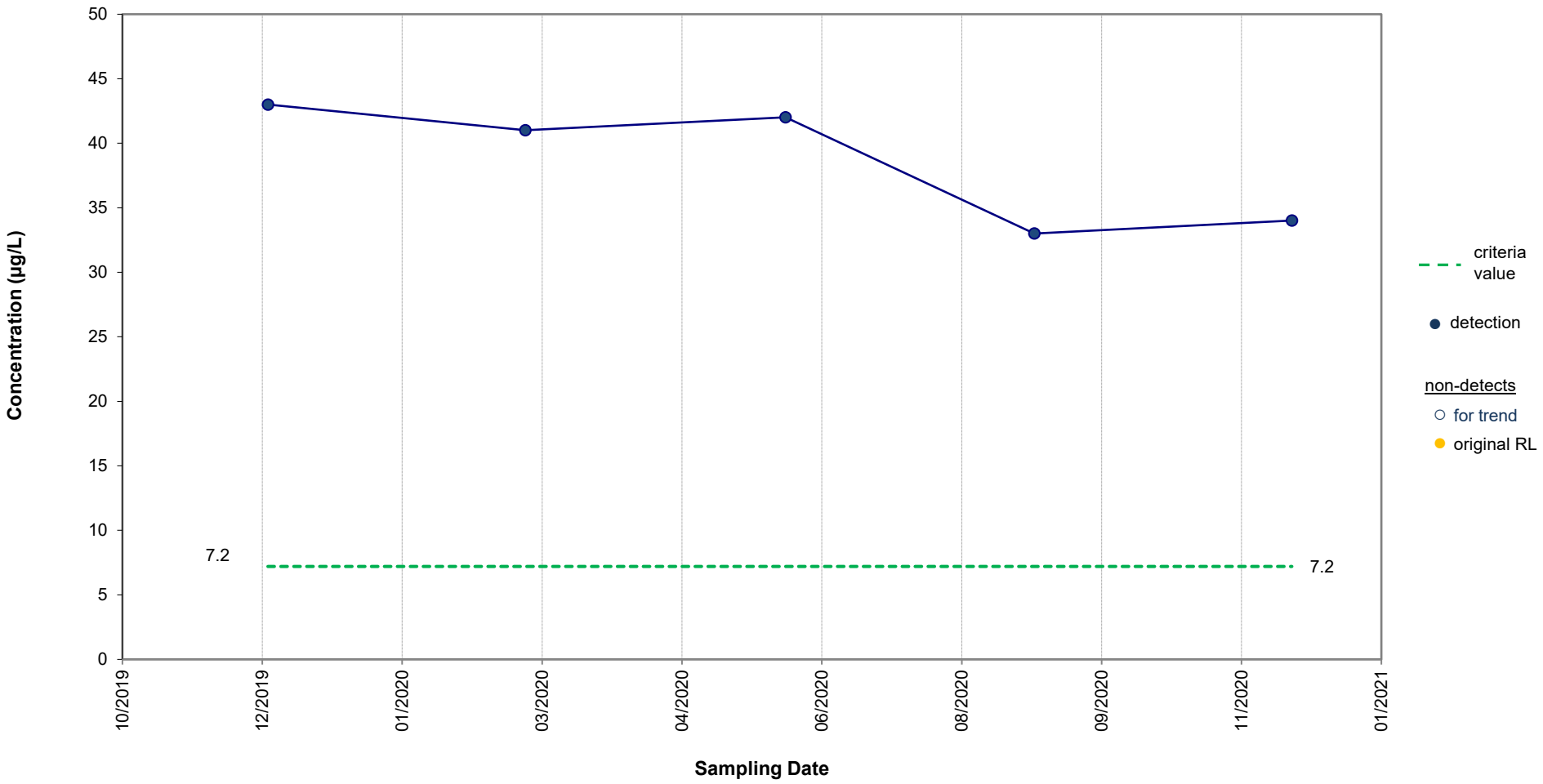
p value = 0.12 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-19-121, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

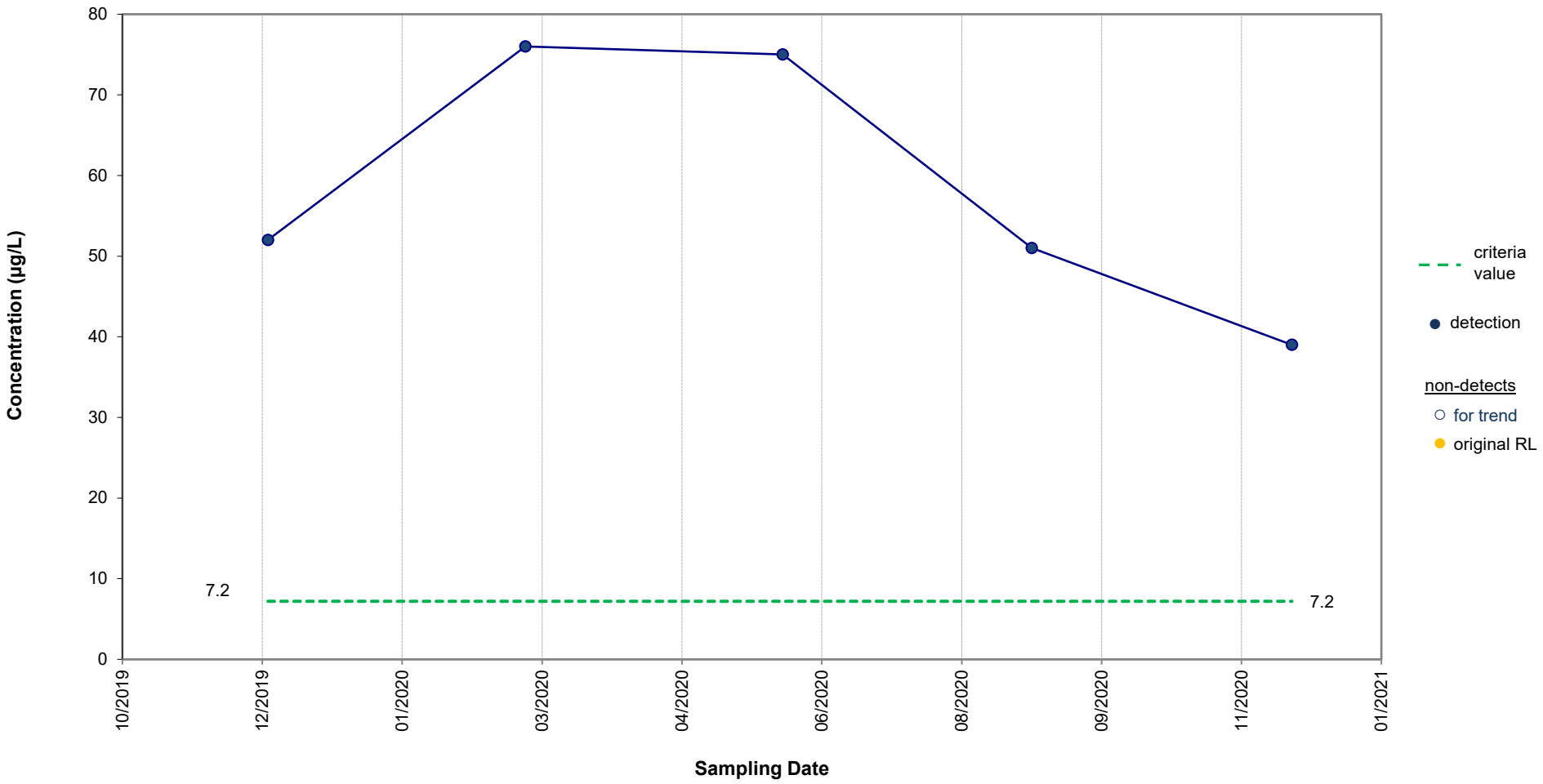
p value = 0.12 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-19-122, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

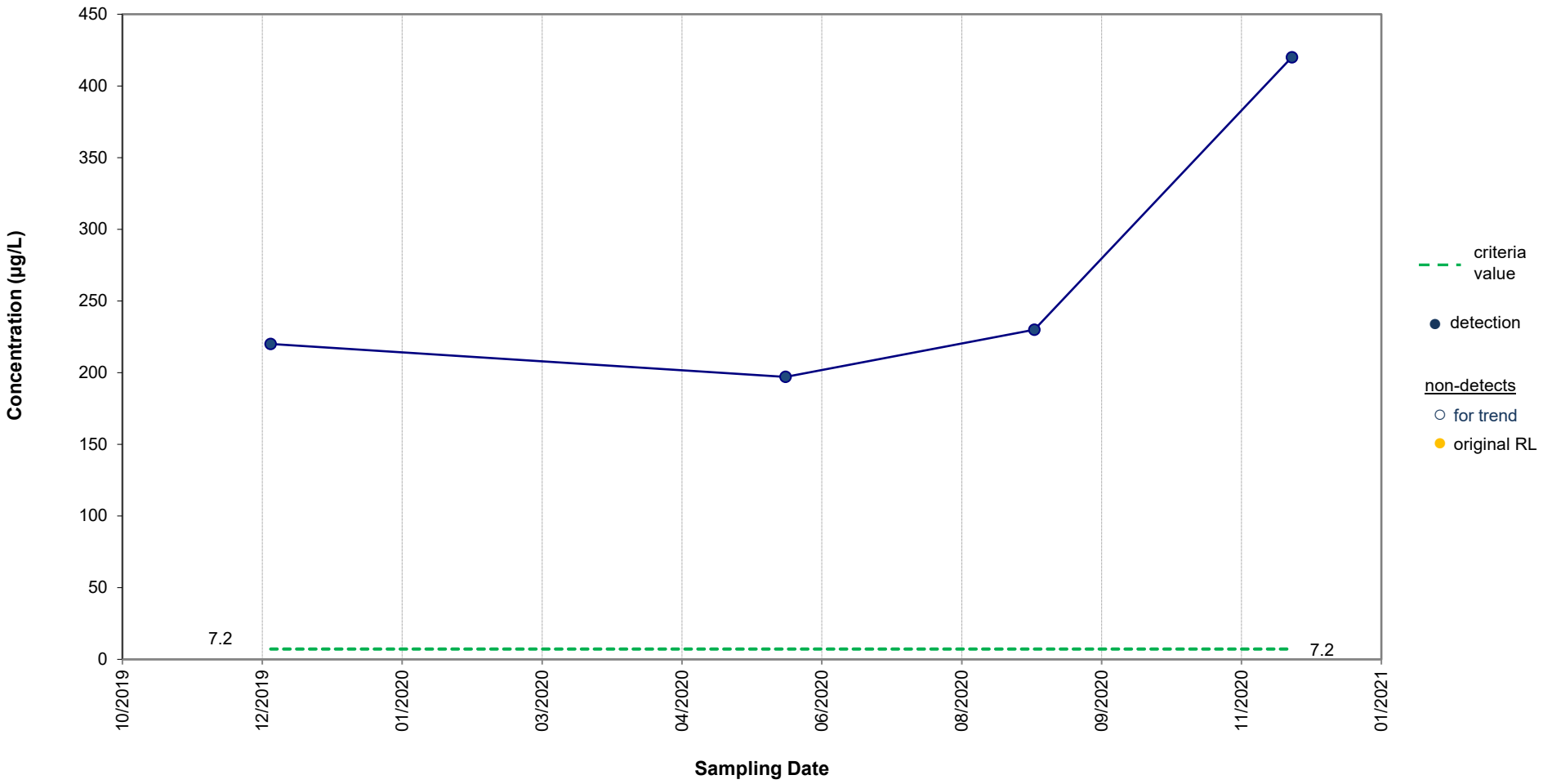
p value = 0.12 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-19-123, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

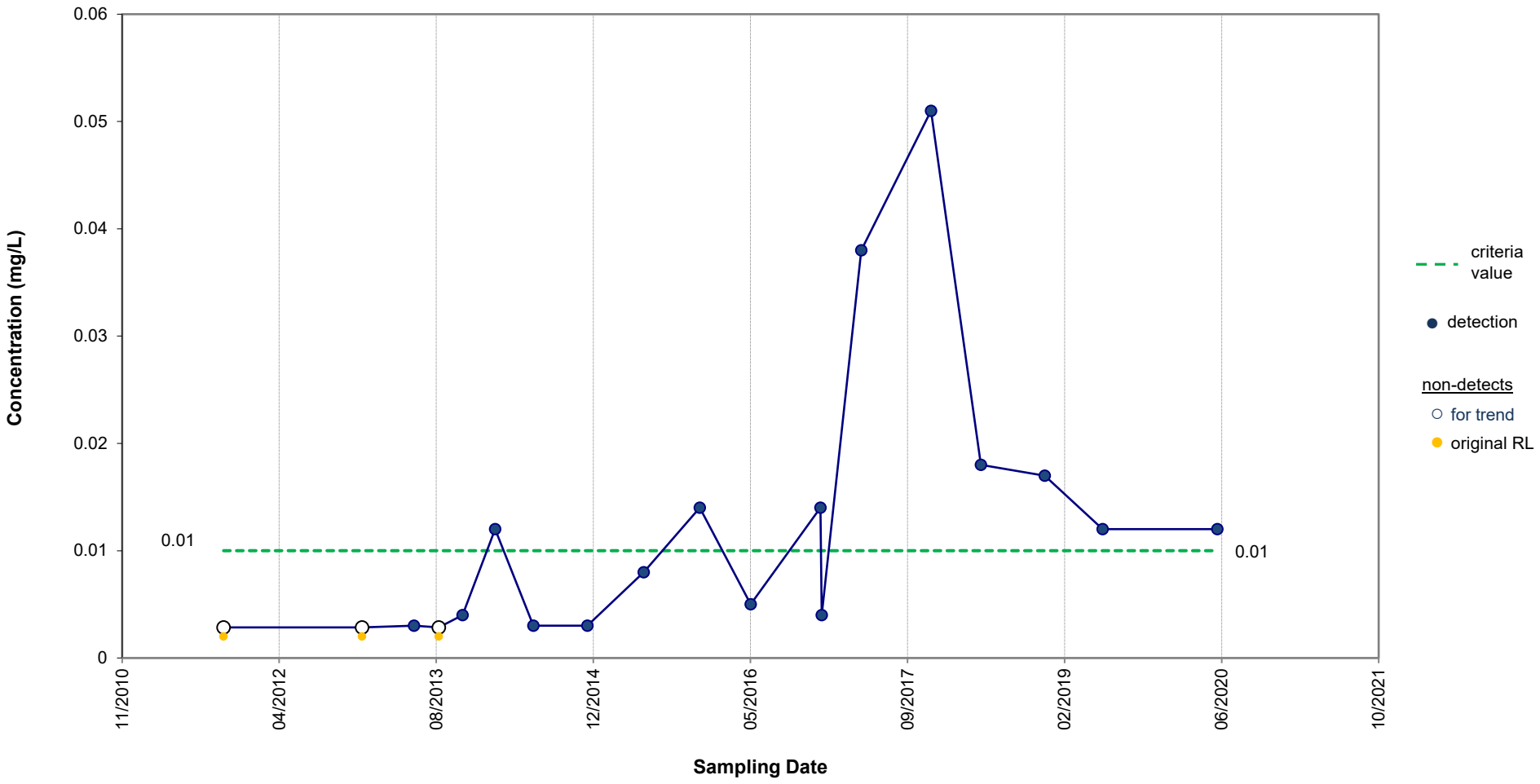
p value = 0.17 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MW-19-124, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

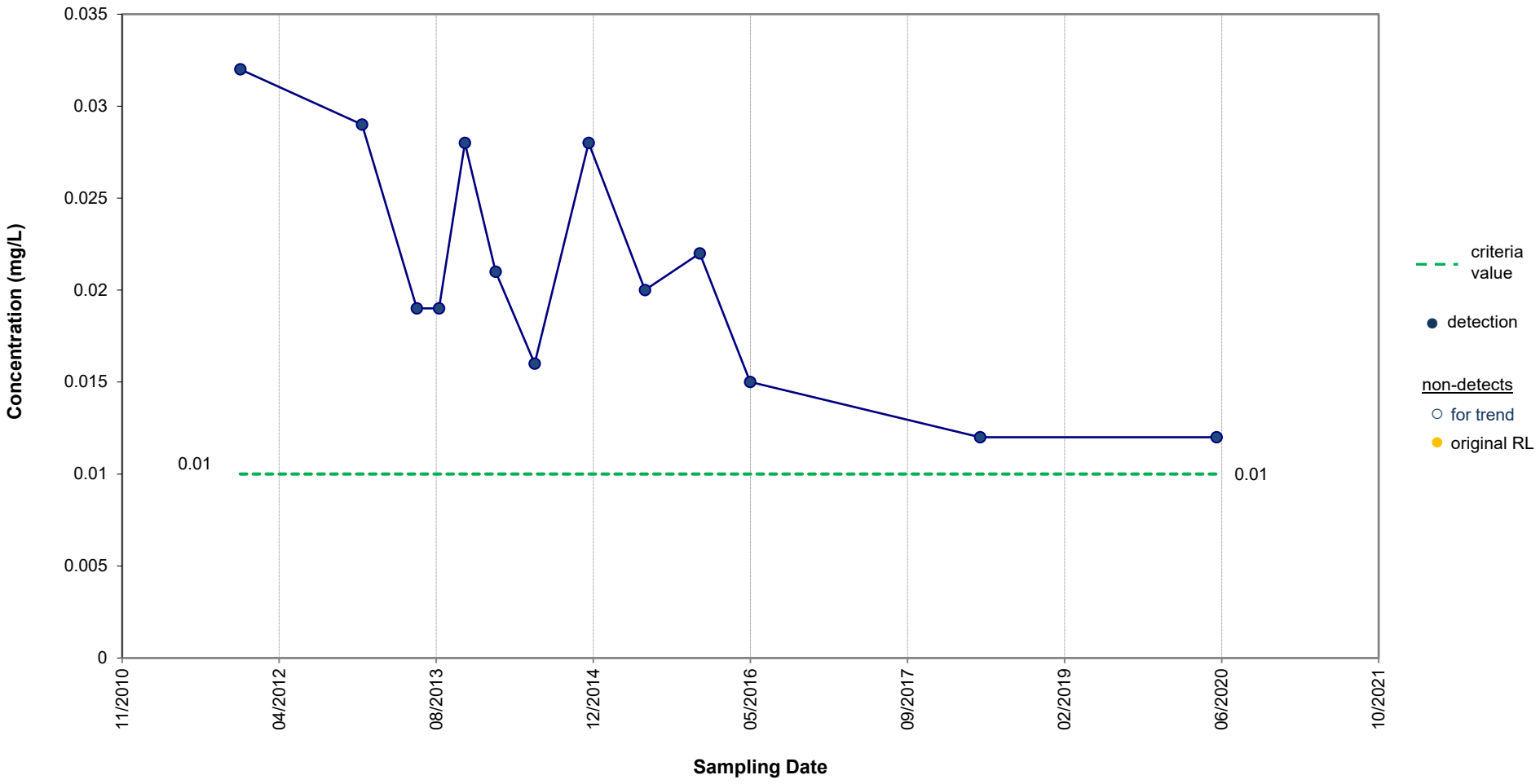
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MWBP-10-UST5-6, Arsenic

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

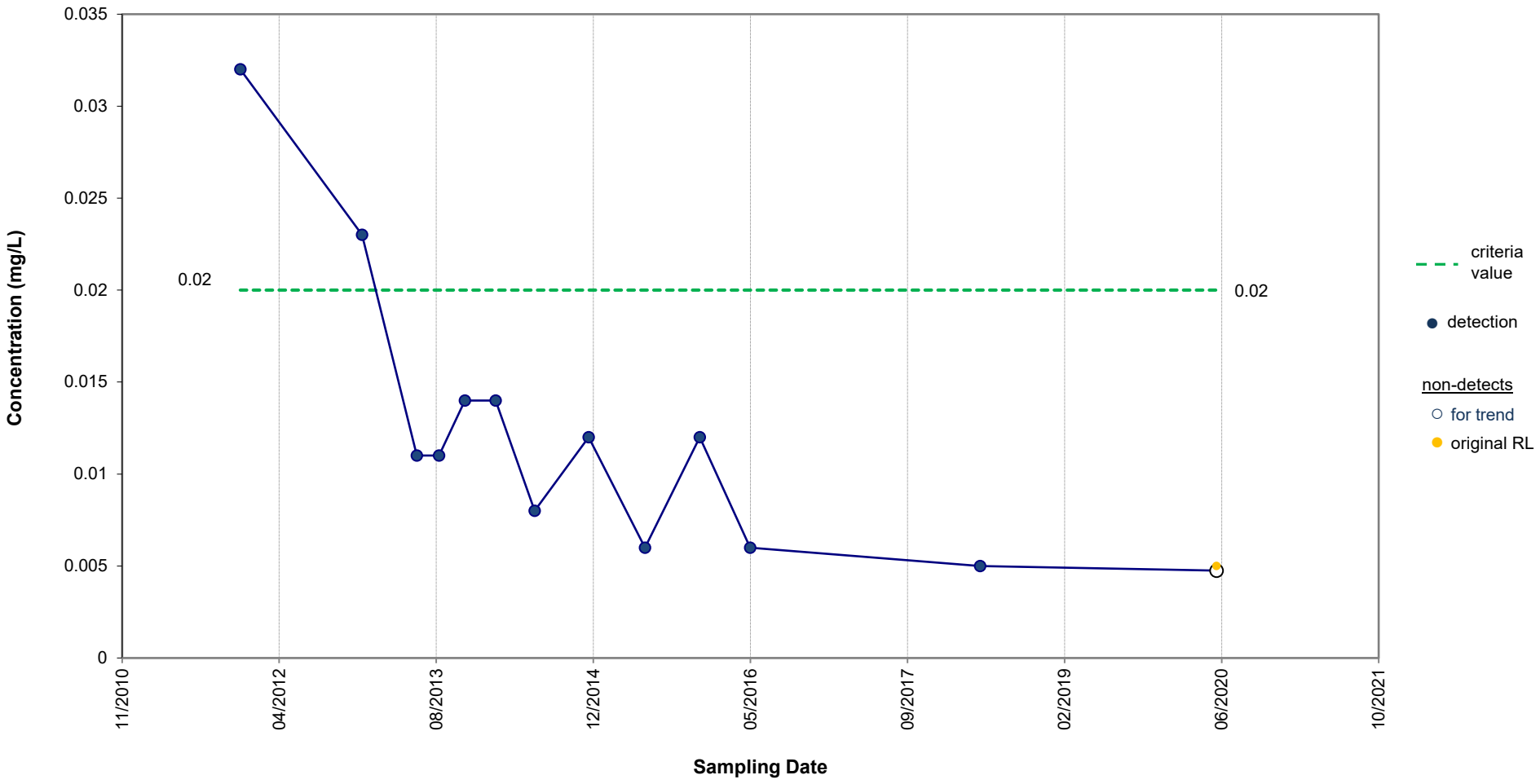
p value = 0.00 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MWBP-11-UST1-4, Arsenic

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

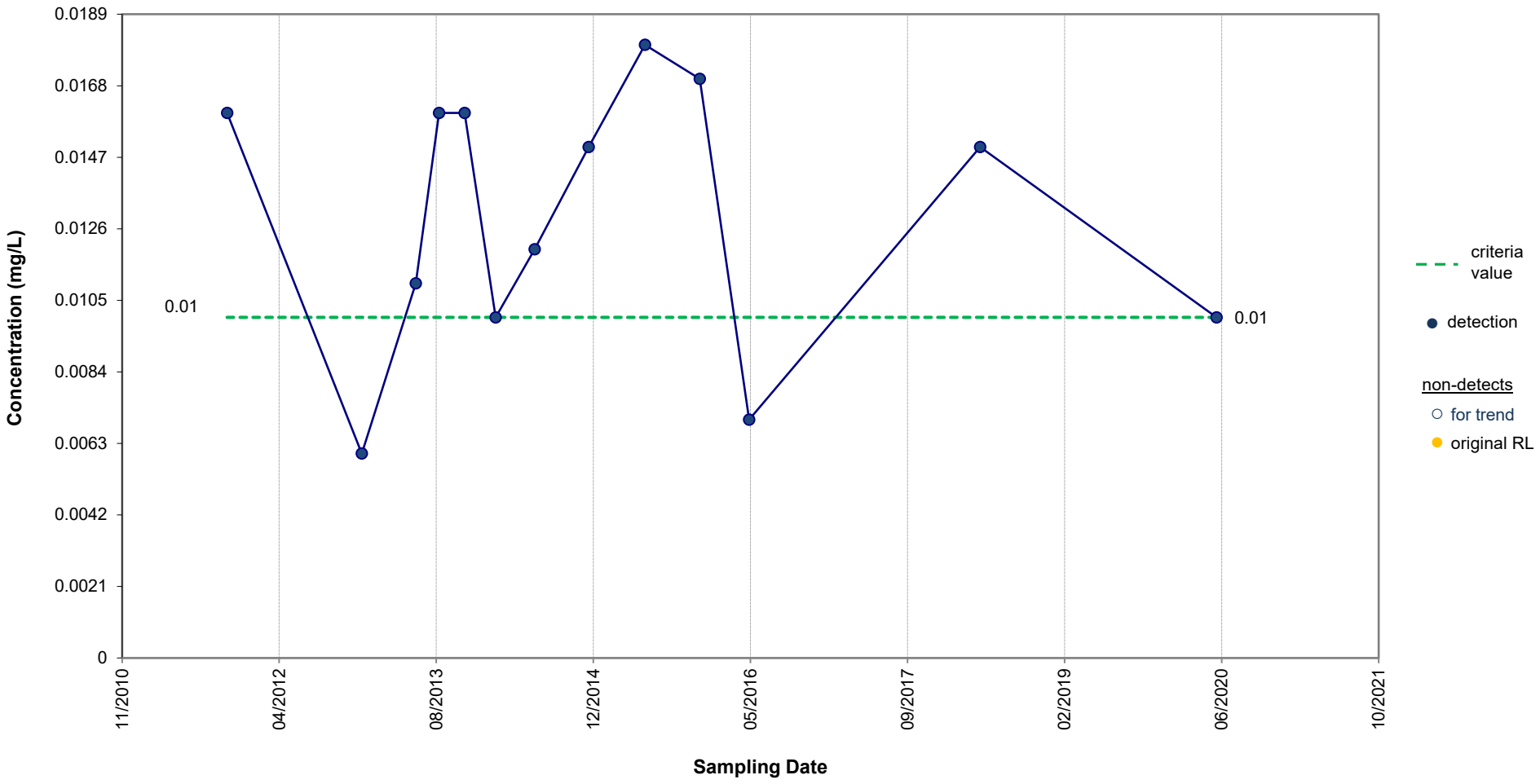
p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MWBP-11-UST1-4, Copper

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

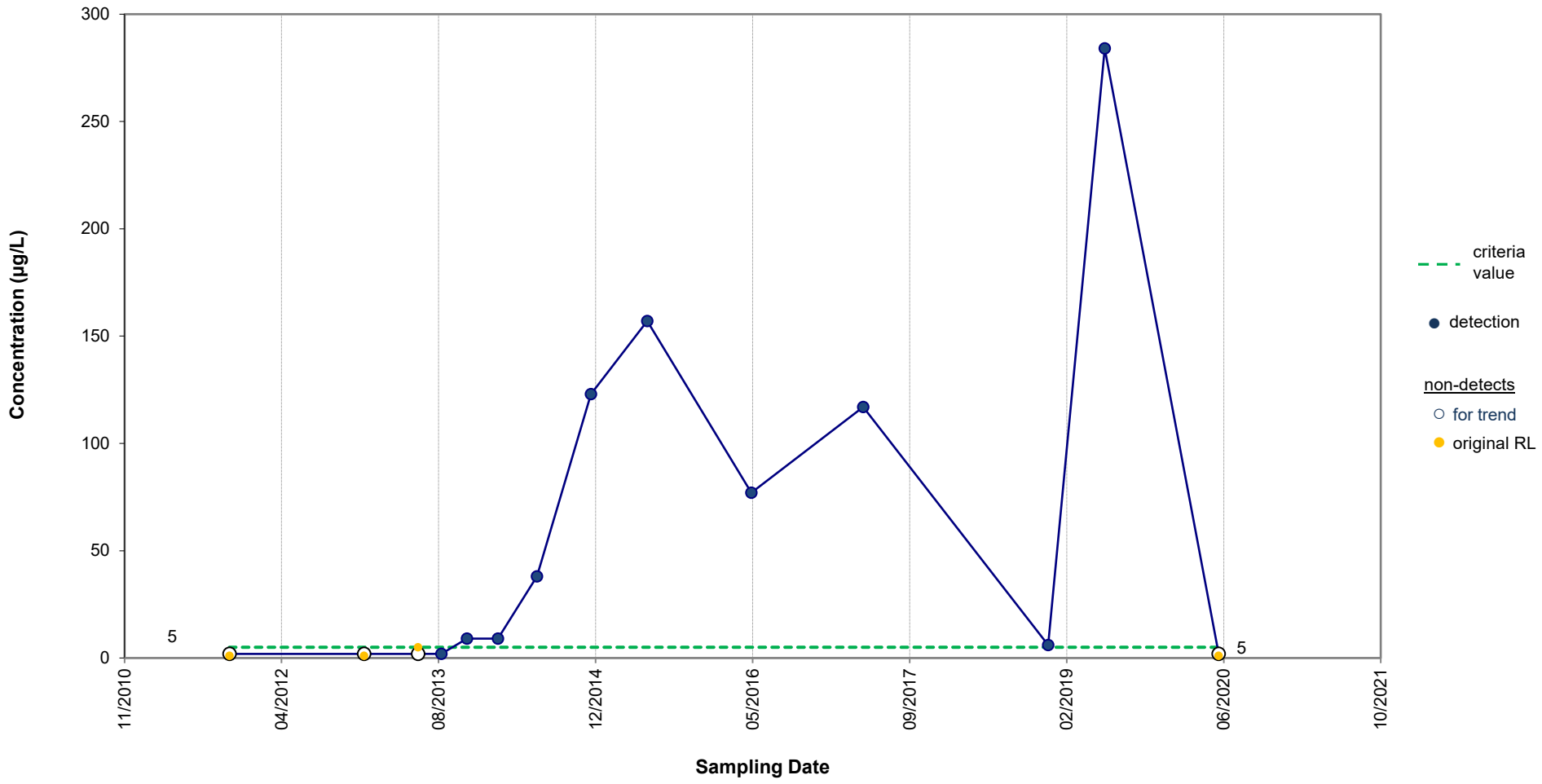
p value = 0.50 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MWBP-12-UST1-4, Arsenic

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **INCREASING TREND**

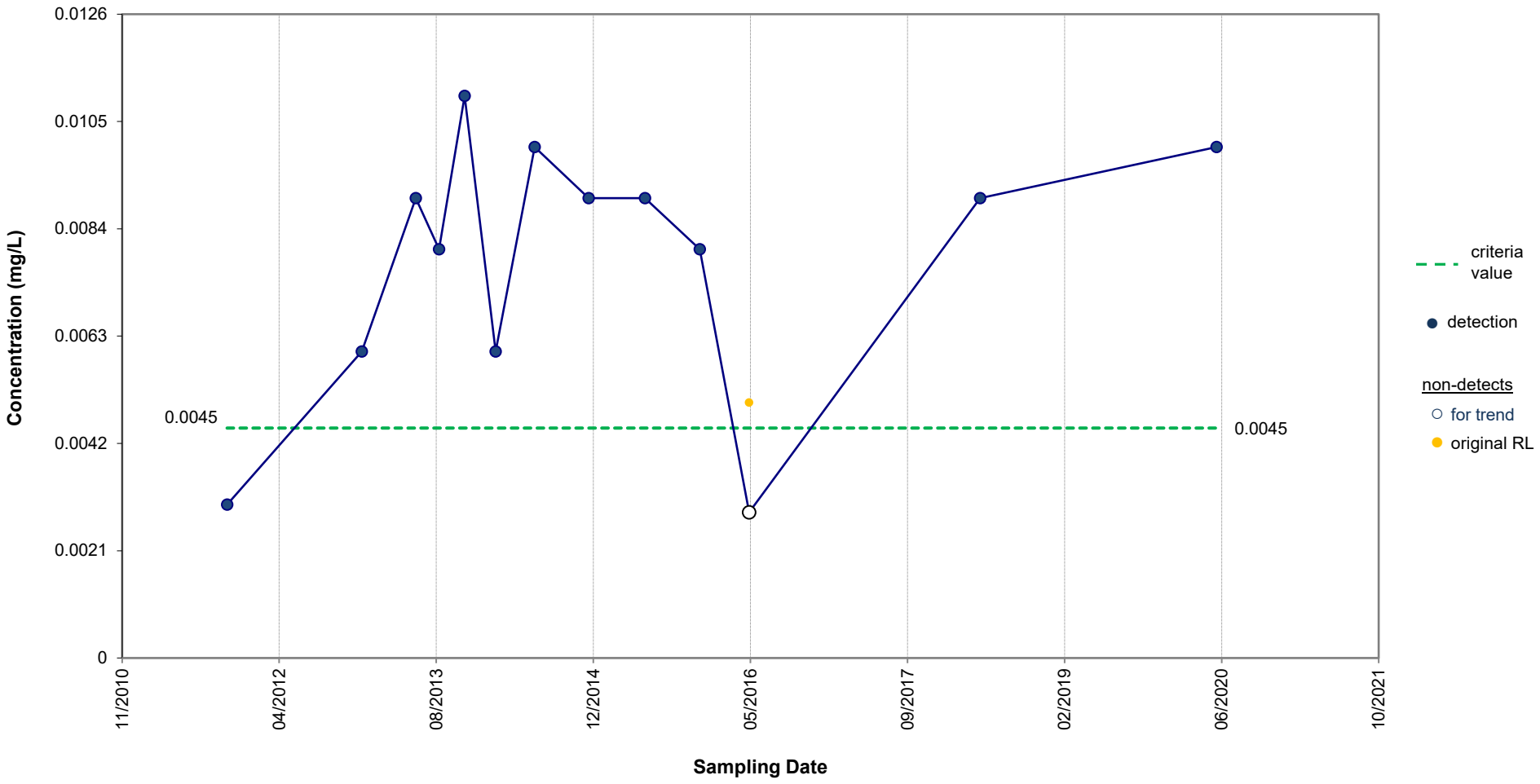
p value = 0.01 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MWBP-12-UST1-4, Benzene

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

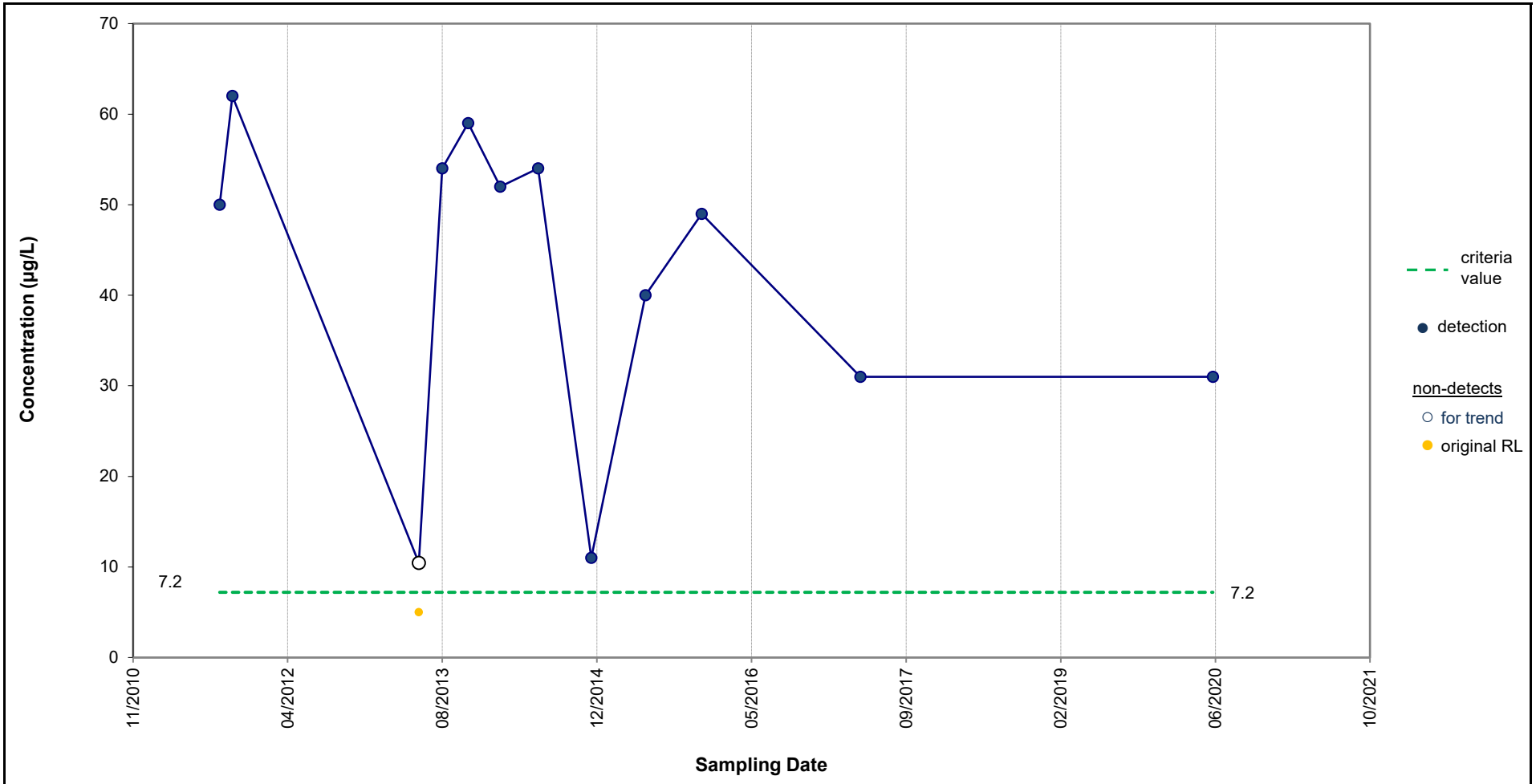
p value = 0.19 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: MWBP-12-UST1-4, Vanadium

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

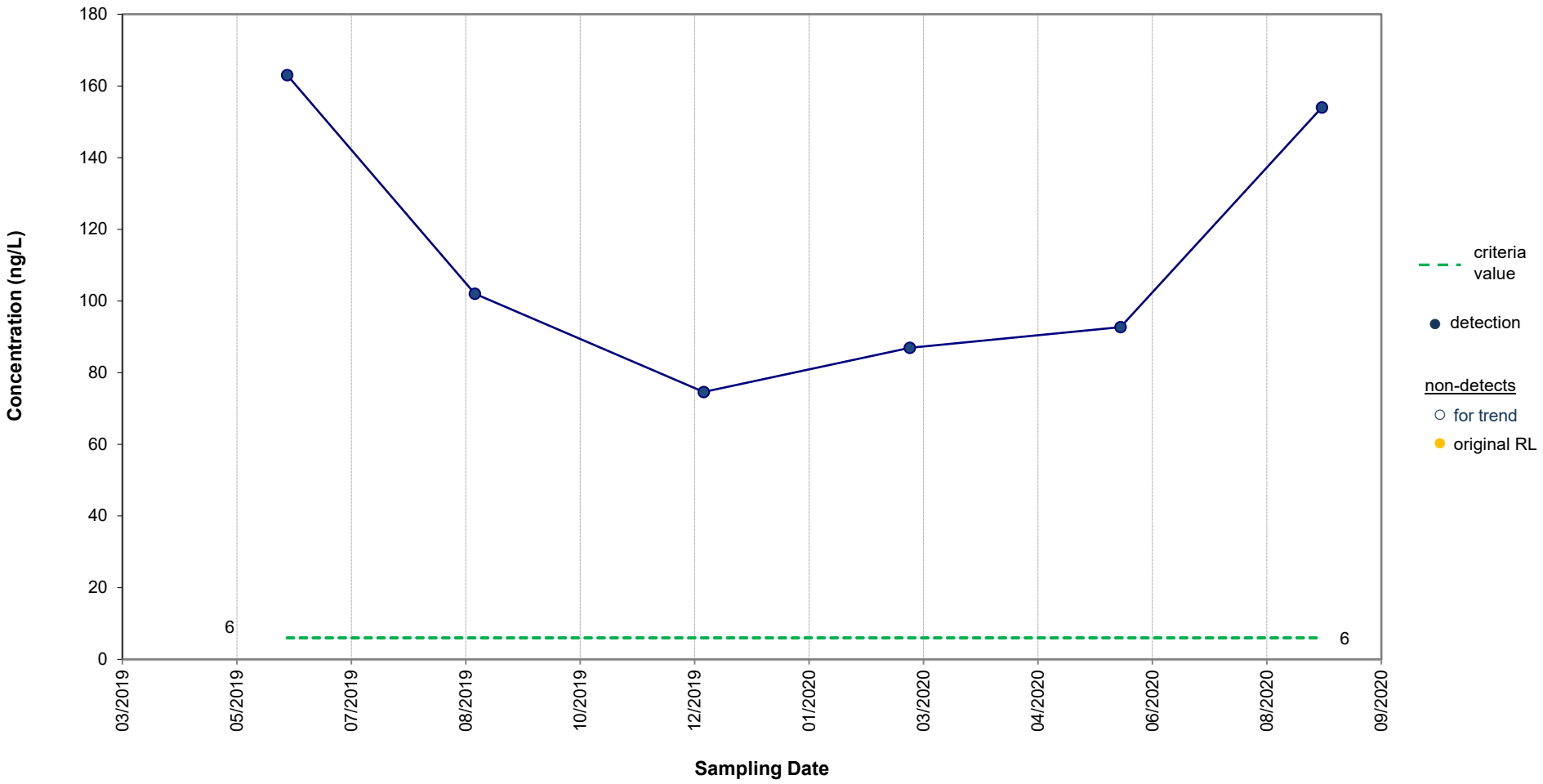
p value = 0.07 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: P2-MW-04, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

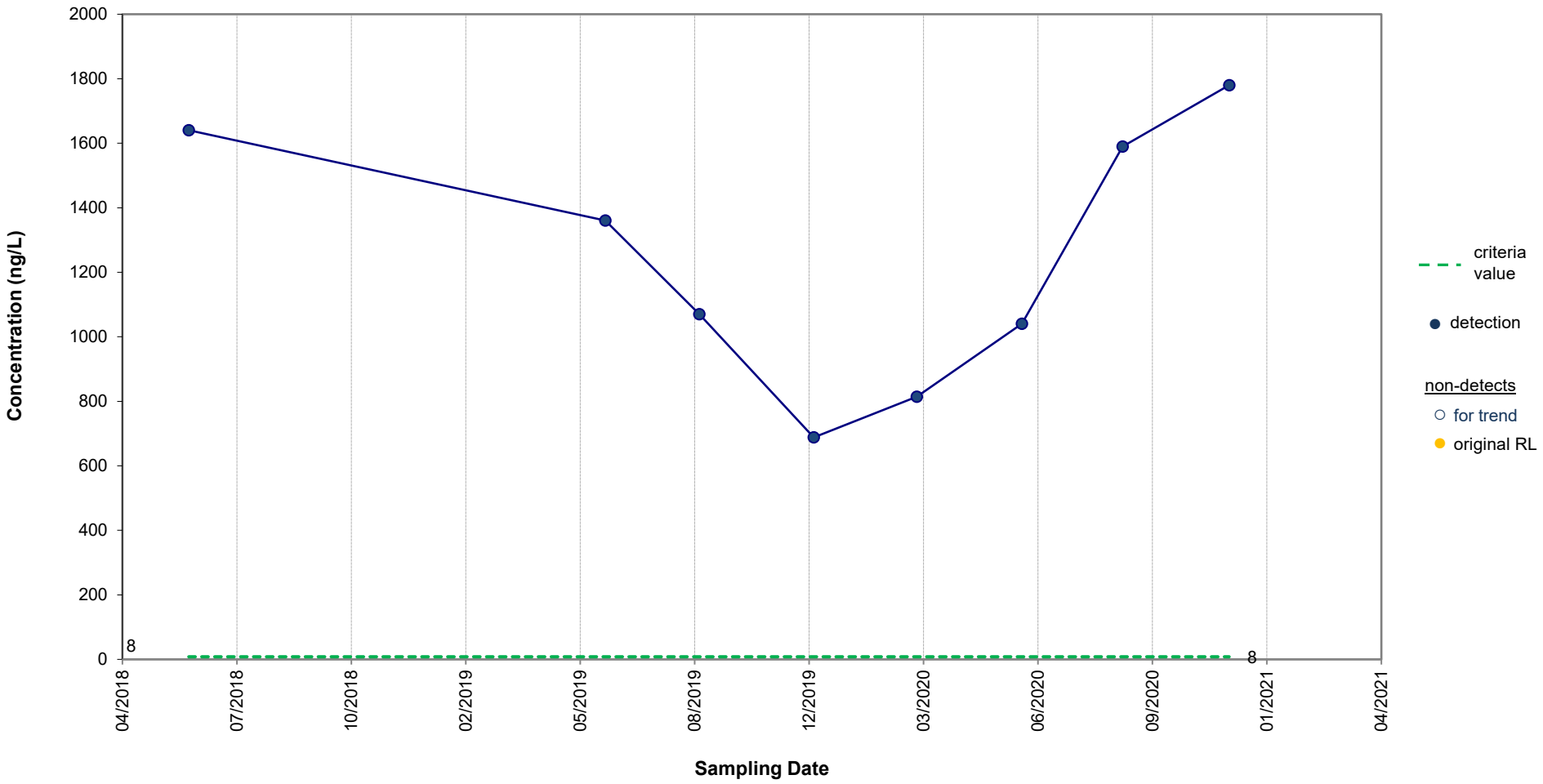
p value = 0.50 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: P6-SB-07, PFNA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

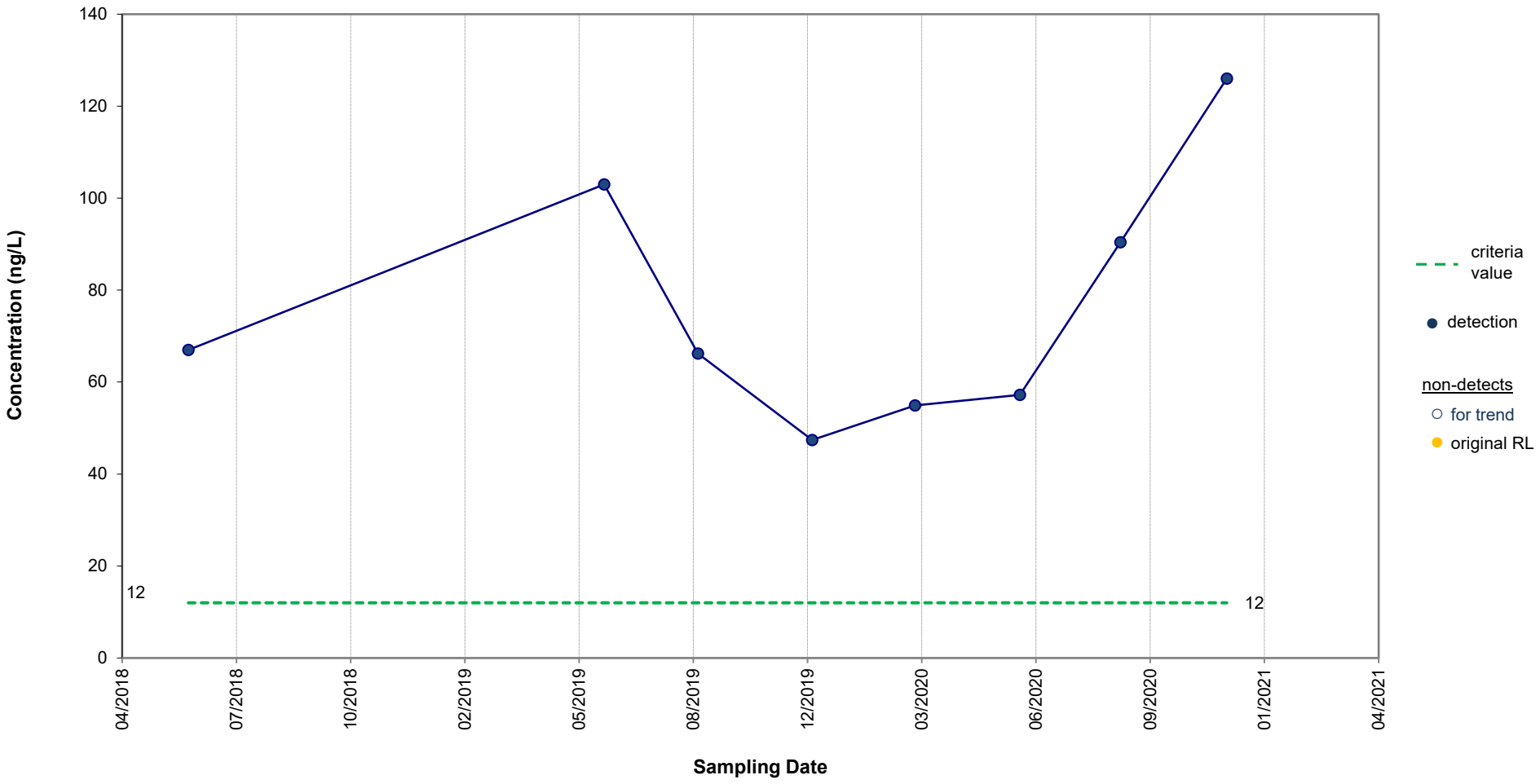
p value = 0.45 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: P6-SB-07, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

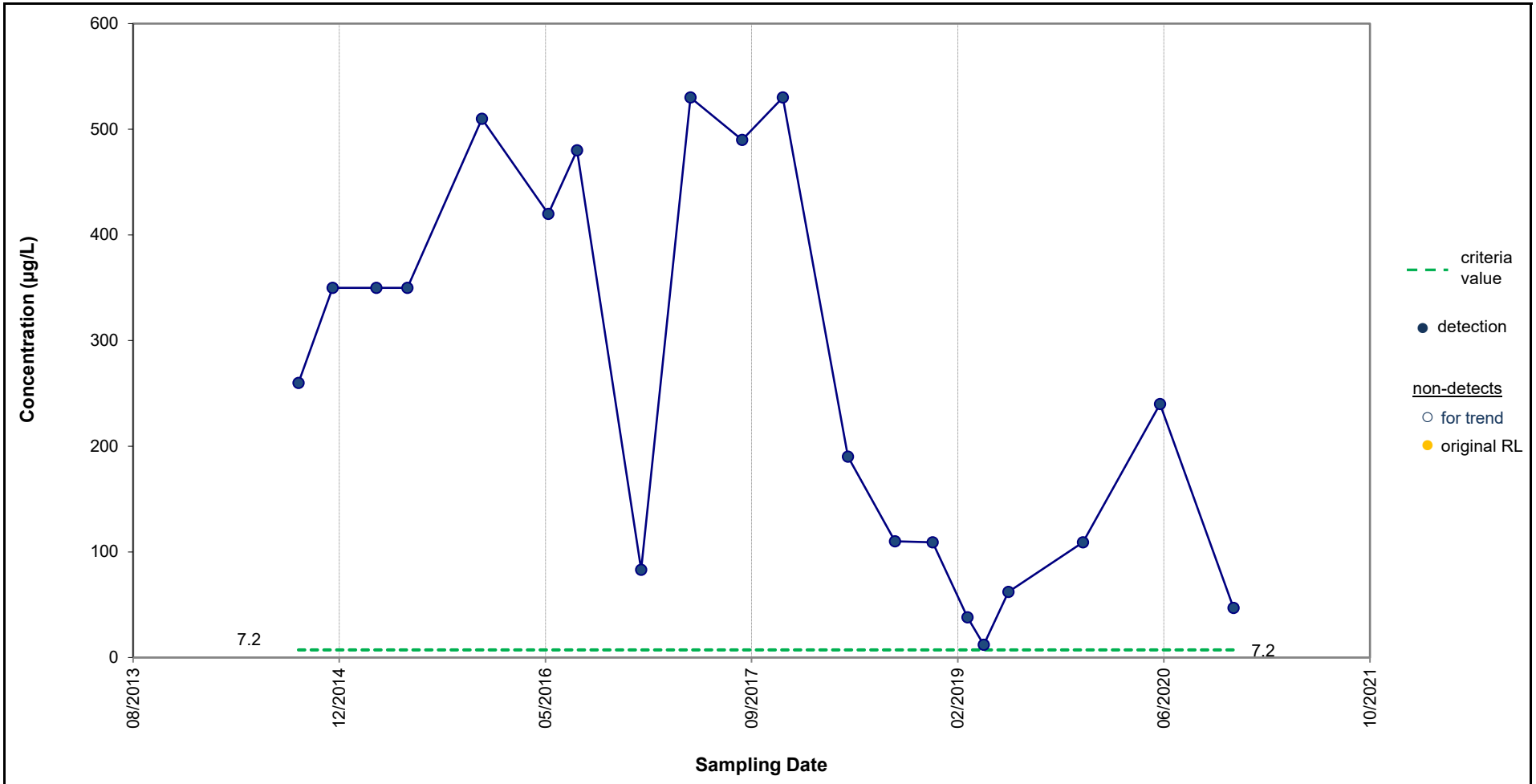
p value = 0.36 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

ARCADIS

Concentration Plot: P6-SB-07, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

p value = 0.02 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

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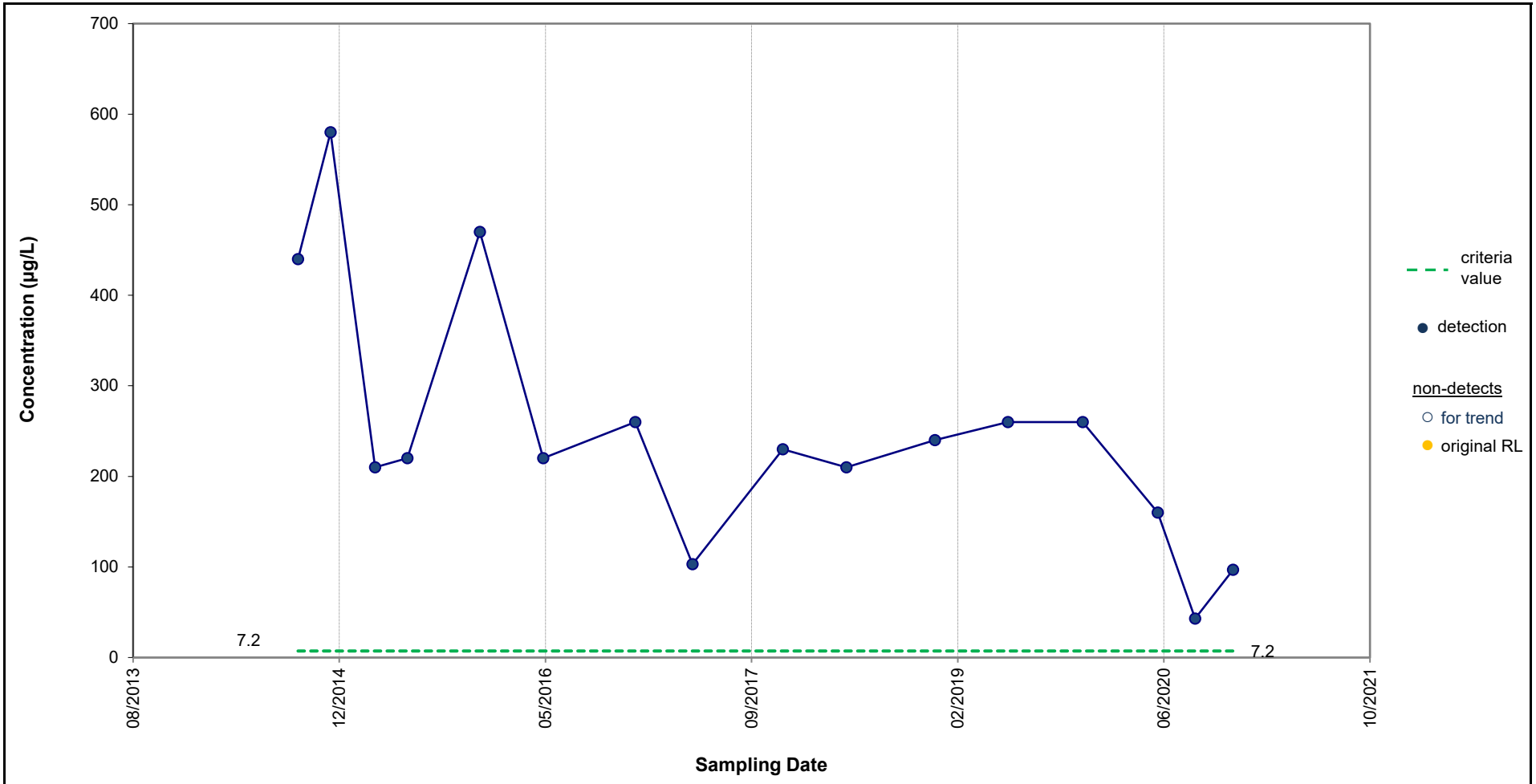
Concentration Plot: PW-14-01, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

p value = 0.03 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

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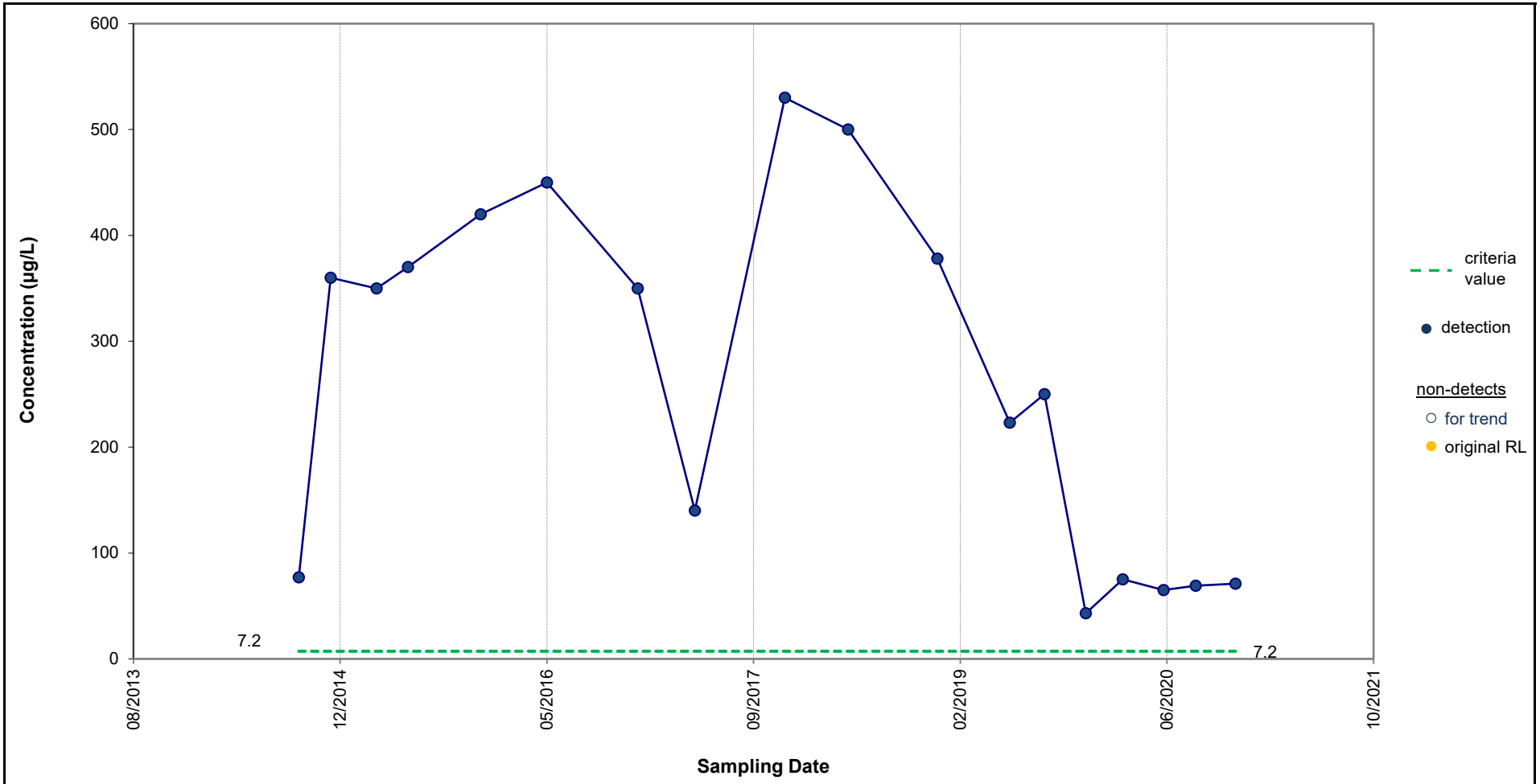
Concentration Plot: PW-14-02, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

p value = 0.03 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

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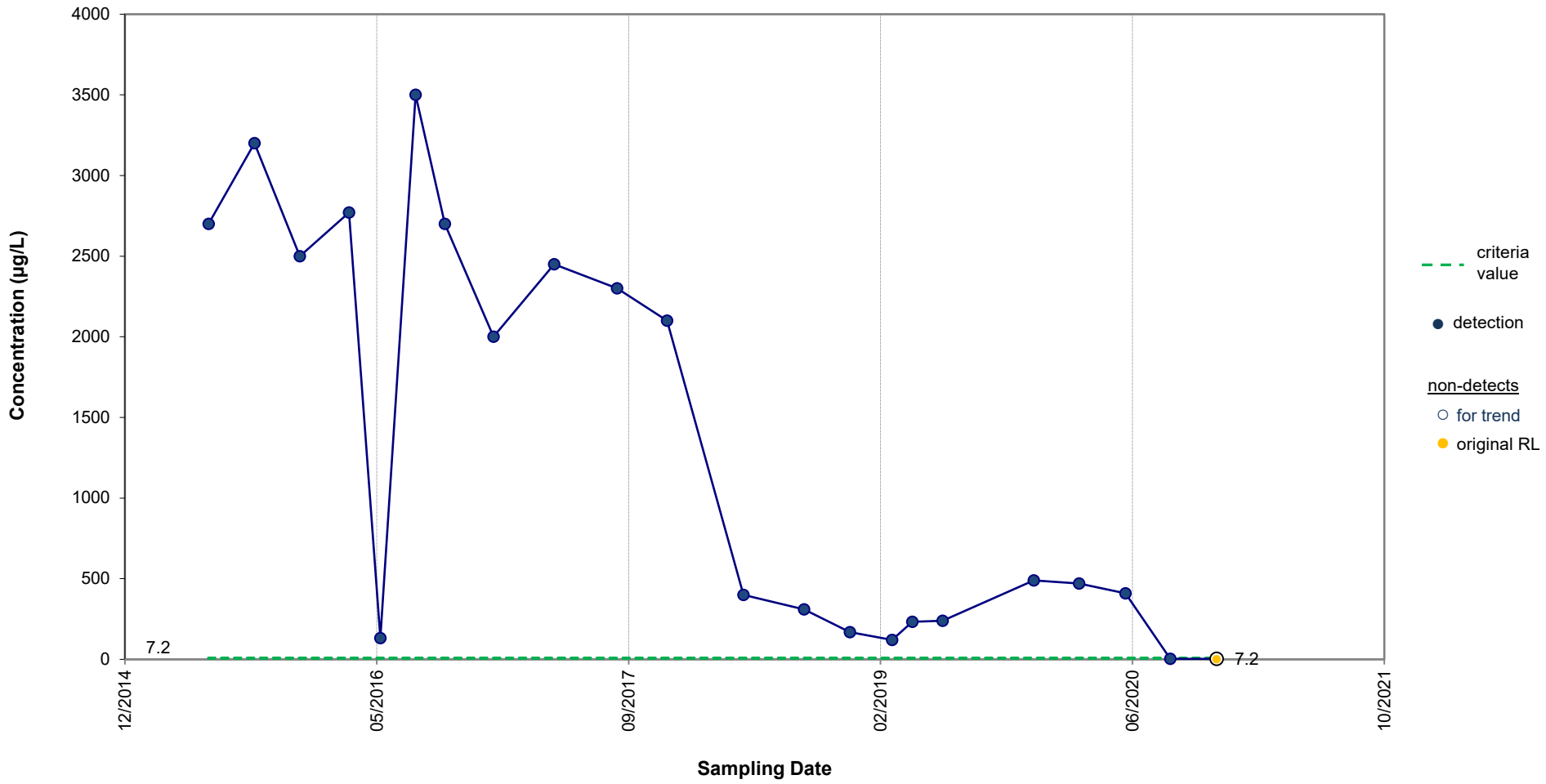
Concentration Plot: PW-14-03, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

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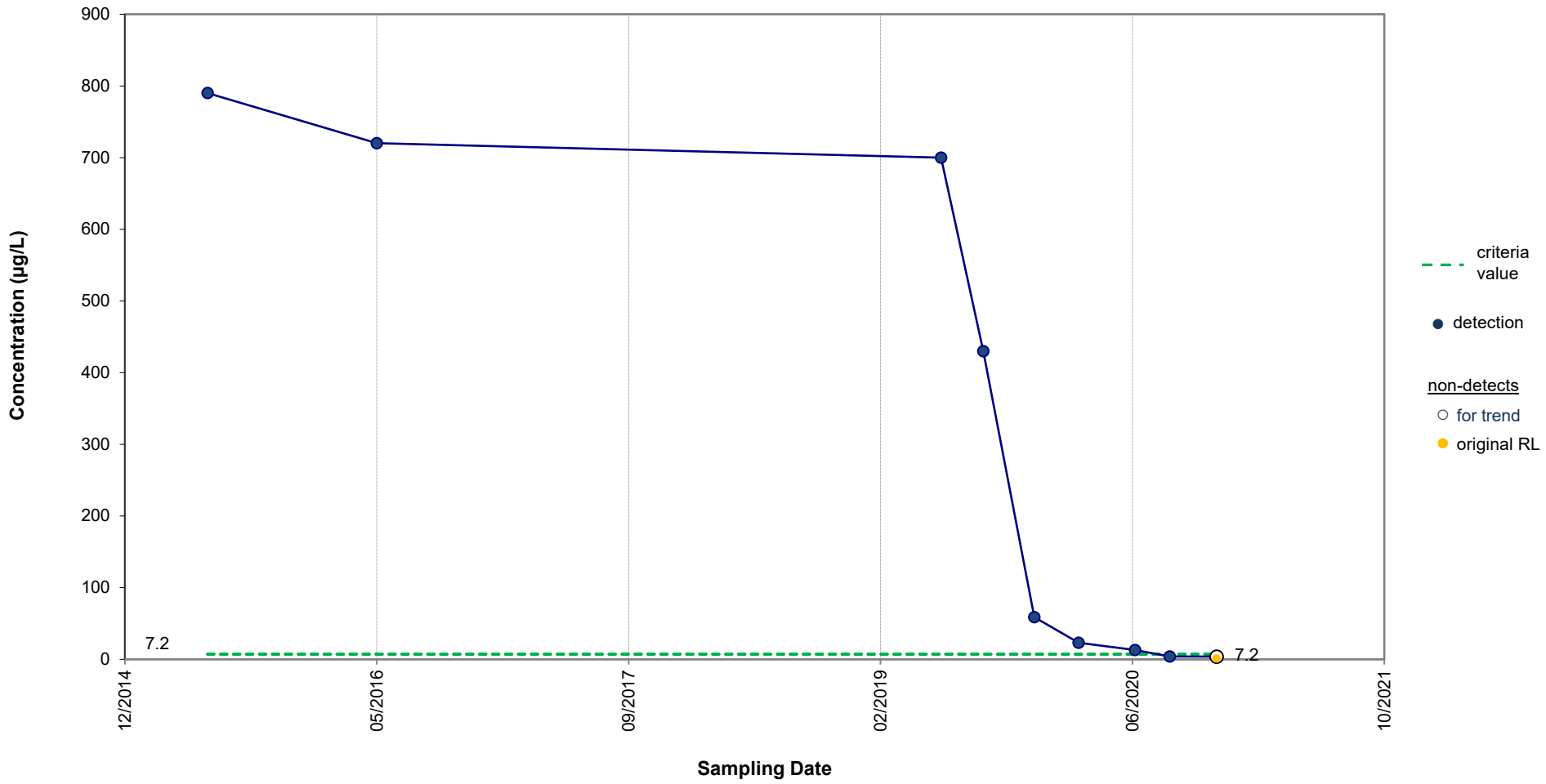
Concentration Plot: TW-14-02, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

p value = <0.001 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

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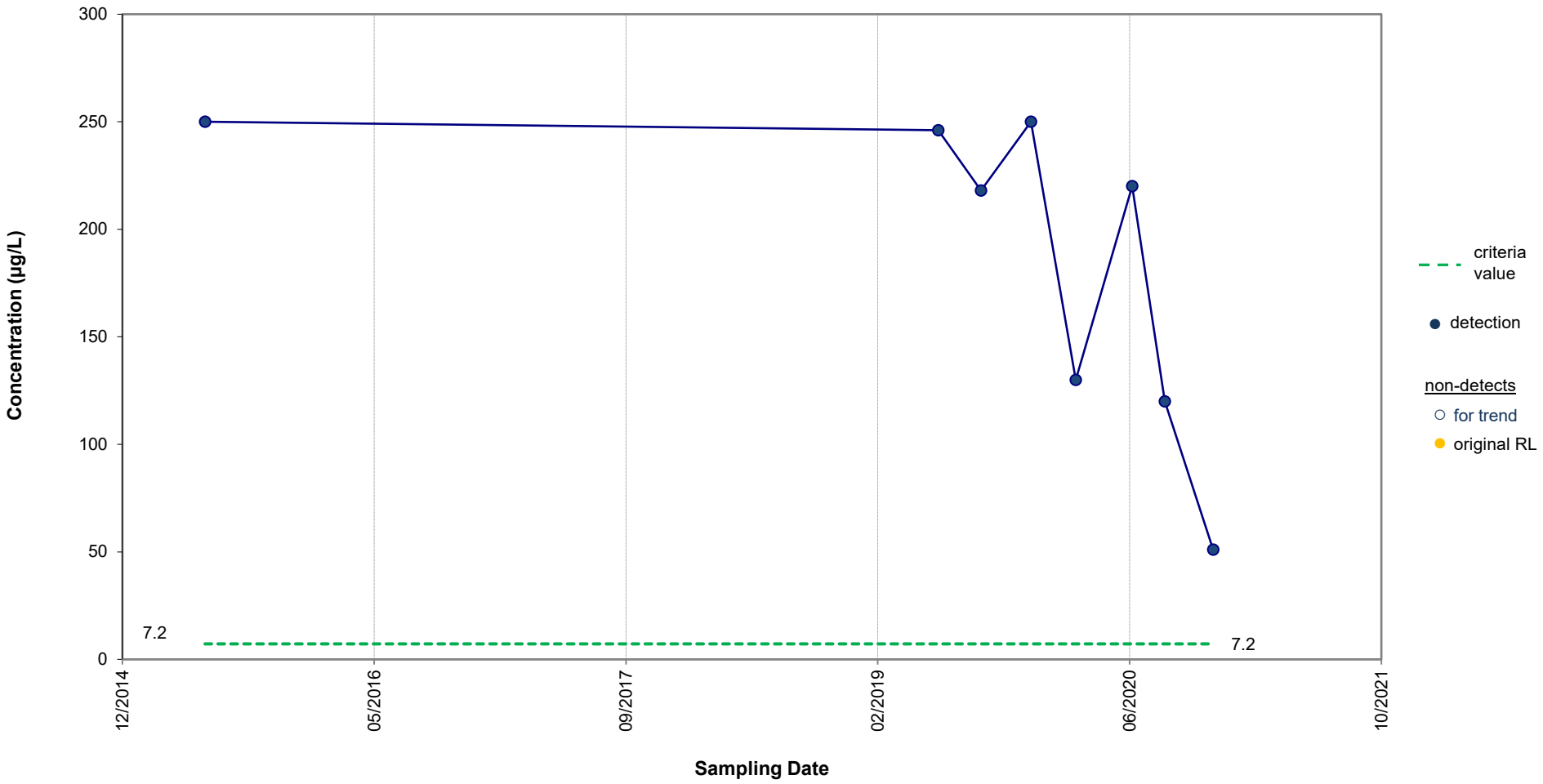
Concentration Plot: TW-14-06, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

p value = 0.01 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

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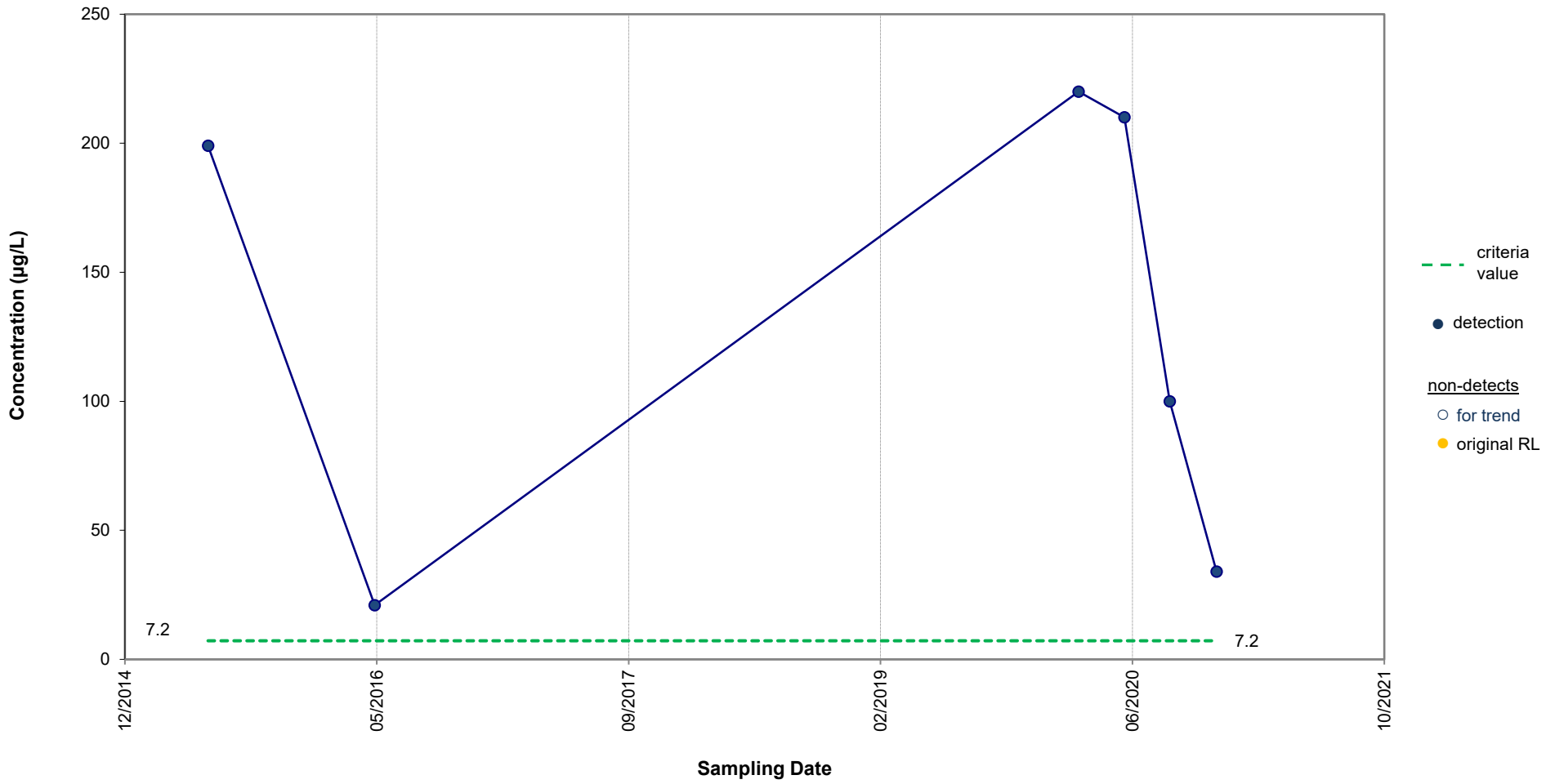
Concentration Plot: TW-15-11, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

p value = 0.36 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

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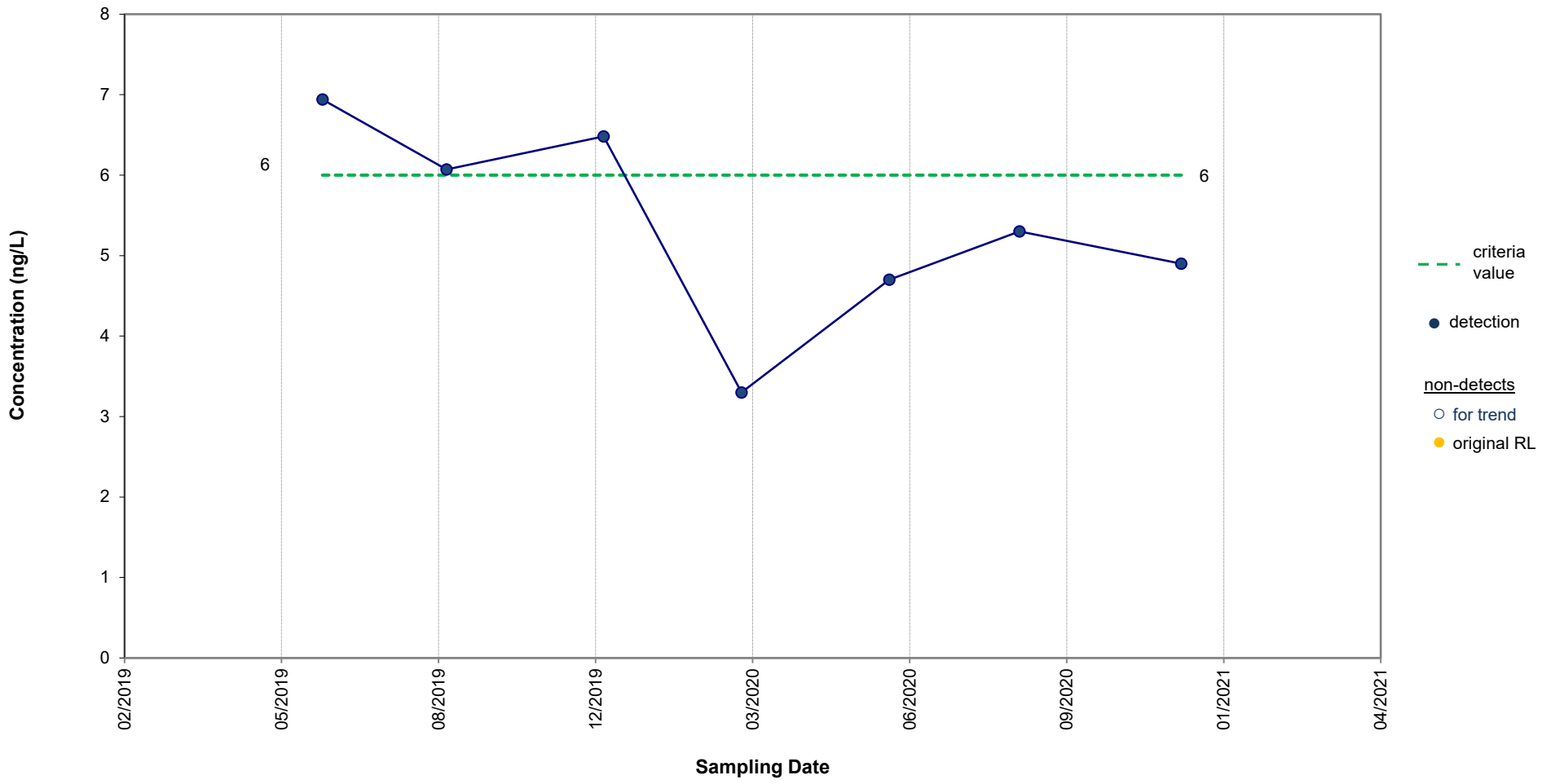
Concentration Plot: TW-15-12, 1,4-Dioxane

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **No Significant Trend**

p value = 0.12 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

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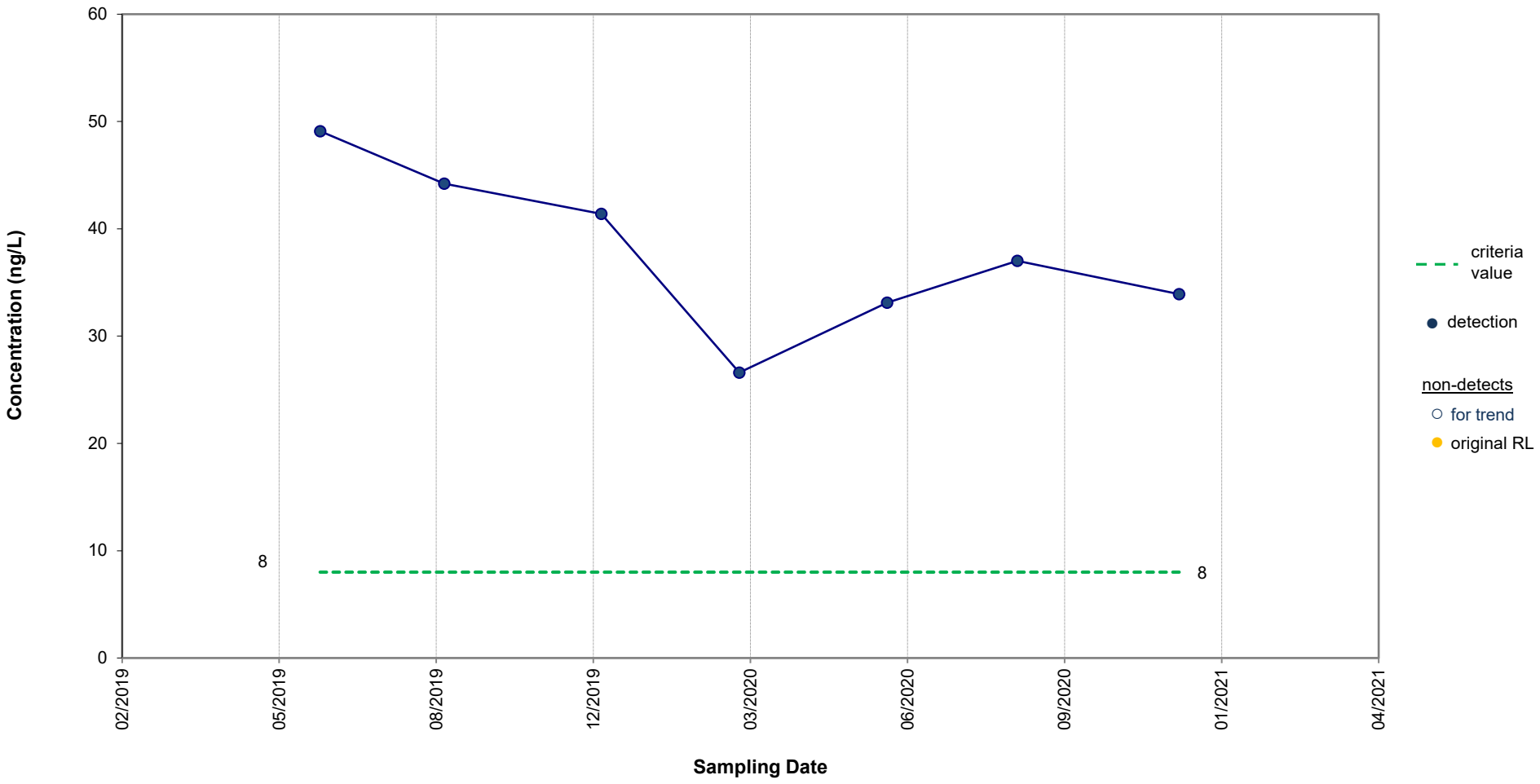
Concentration Plot: UNK-15, PFNA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F



Results of Mann-Kendall Test for Trend: **DECREASING TREND**

p value = 0.07 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

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Concentration Plot: UNK-15, PFOA

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

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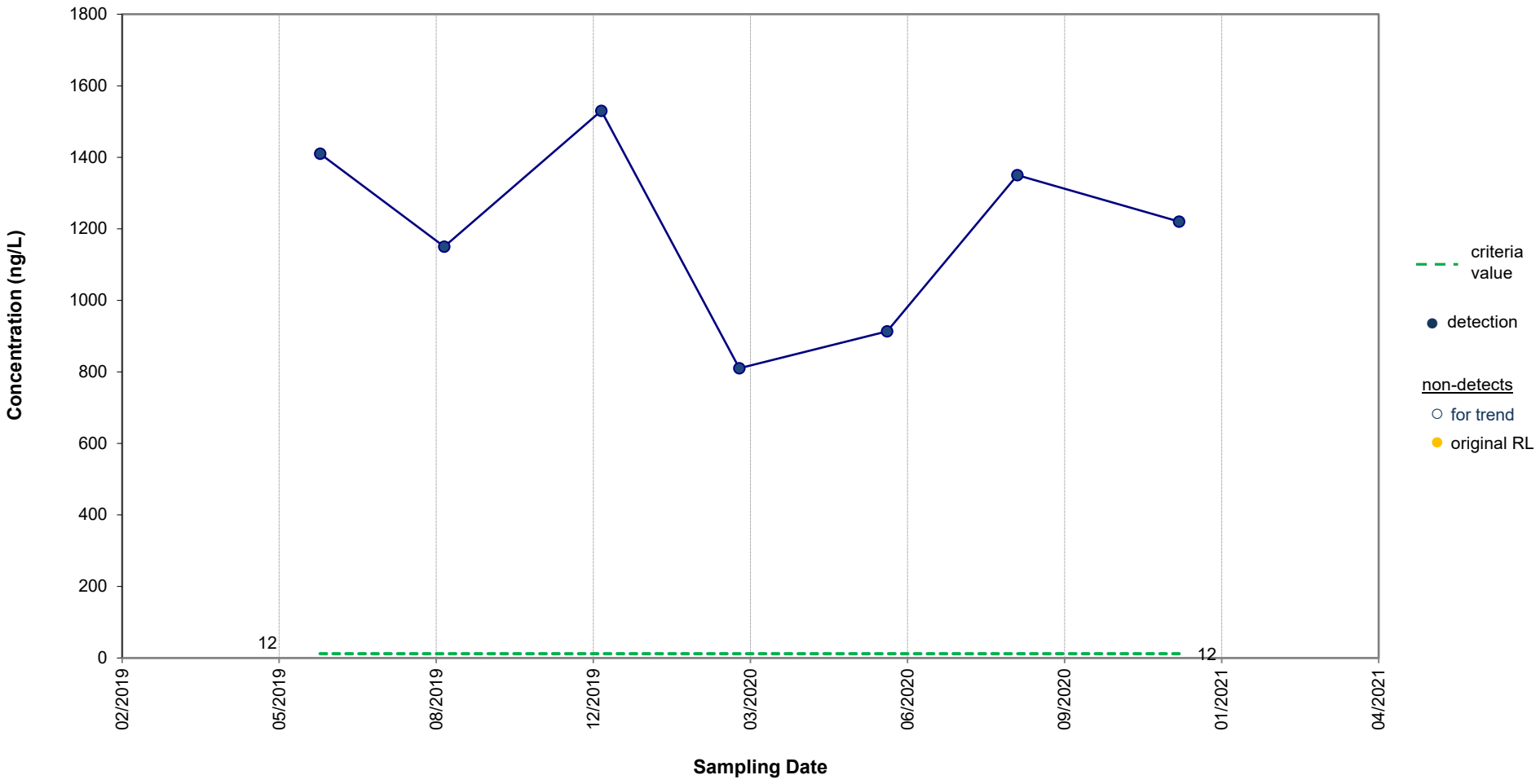

Results of Mann-Kendall Test for Trend: **No Significant Trend**

p value = 0.39 Note: p value < 0.1 indicates a statistically significant trend (90% Confidence Interval).

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Concentration Plot: UNK-15, PFOS

RACER Trust Plants 2, 3, and 6 - Lansing, Michigan

Appendix F

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