

# Memo



**TO**  
Christine Matlock, EGLE

**COPIES**  
Joe Rogers, EGLE  
John McCabe, EGLE  
Dave Favero, RACER Trust

**DATE**  
January 27, 2022

**PROJECT NUMBER**  
30112892

**FROM**  
Patrick Curry, Arcadis

**SUBJECT**  
1,4-Dioxane Investigation Memo - 2021  
RACER Trust, Plant 2, Lansing, Michigan

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Arcadis of Michigan, LLC (Arcadis) on behalf of the Revitalizing Auto Communities Environmental Response (RACER) Trust has completed additional 1,4-dioxane investigation activities on Plant 2 (site) in Lansing, Michigan. The 1,4-dioxane investigation work was initially proposed as part of the *1,4-Dioxane Monitoring Well Installation and Test Well Abandonment Work Plan – 2021* (Arcadis 2021). Final approval of the investigation approach was provided in a Conditional Approval Letter from Kimberly Tyson dated October 18, 2021. The eleven soil borings included in this investigation were successfully completed between October 25 through November 8, 2021. The well abandonment activities will be summarized with a separate submittal.

The additional 1,4-dioxane investigation activities were completed to further evaluate weathered bedrock impacts in two areas. The existing lower 1,4-dioxane plume monitoring network did not include any monitoring wells installed within the core of the lower 1,4-dioxane plume where the plume enters Plant 2 from the north. Work in this area was completed to recharacterize the lower 1,4-dioxane plume in the north of Plant 2 and install a well to facilitate biosparge performance monitoring. At the Plant 2 per- and polyfluorinated alkyl substances (PFAS) source area additional investigation was completed to evaluate the source and extent of 1,4-dioxane detected at MW-20-130. Well MW-20-30 is a double cased weathered bedrock monitoring well installed to evaluate the potential for vertical migration of PFAS to weathered bedrock from the perched zone. However, recent sampling of this well has shown 1,4-dioxane concentrations above Part 201 Drinking Water Criteria. The completed scope of work included the following:

- Five weathered bedrock vertical aquifer profile (VAP) borings across the core of the lower 1,4-dioxane plume within the northern Plant 2 parking lot
- One additional biosparge performance monitoring well within the lower 1,4-dioxane plume at the northern boundary of Plant 2
- One perched monitoring well adjacent to MW-20-130 to evaluate 1,4-dioxane potentially associated with the Plant 2 PFAS source area
- Three VAP borings around the Plant 2 PFAS source area to evaluate potential extent of 1,4-dioxane in weathered bedrock
- Two weathered bedrock monitoring wells downgradient of weathered bedrock monitoring well MW-20-130

## Northern Plant 2 Weathered Bedrock VAP and Performance Monitoring Well Installation

A total of six VAP borings were completed using sonic drilling methods within the core of the lower 1,4-dioxane plume in the area where it enters Plant 2 from the north. One to two VAP samples were collected from depths between 68 to 81 feet below ground surface (bgs) at each of the five locations to recharacterize the plume in this area, followed by installation of a weathered bedrock monitoring well (converted VAP-P2-JO68 to MW-21-142) to facilitate performance monitoring of the biosparge remedy. All VAP boring locations are shown on **Figure 1**.

At each location:

- Borings were advanced approximately 10 feet into the weathered bedrock with total depths up to 81 feet bgs.
- Continuous soil cores were obtained from the ground surface to the target well depth at each boring location. An Arcadis geologist logged and described the soils in accordance with the Arcadis Soil Description Standard Operating Procedures. Soil Boring Logs were generated based on the field descriptions and are included in **Attachment 1**.
- VAP groundwater samples were collected from the weathered bedrock using a retractable stainless-steel screen and submersible pump.
- Groundwater samples were submitted to Merit Laboratories (Merit) for 1,4-dioxane analysis using United States Environmental Protection Agency (USEPA) Method 8260 SIM on a 24-hour turnaround time. Groundwater analytical laboratory reports are included in **Attachment 2** and a summary of all analytical data is included in **Table 1**.
- The boreholes were left open and remained cased into bedrock using the outer drill casing to await the analytical results.
- The VAP borings that were not converted to monitoring wells were abandoned by grouting from the bottom up using a tremie pipe and bentonite grout.

Analytical results from the VAP groundwater samples have been used to determine the approximate location of the lower 1,4-dioxane plume core. The initial transect, consisting of 5 borings east of MW-14-63, showed limited concentrations of 1,4-dioxane with a max of only 12 µg/L at SB-P2-KH75. It is unclear why concentrations are lower at this location compared to south of this location where concentrations rebound into the 100s of µg/L (e.g., MW-20-126, **Figure 1**). Therefore, to provide a better point for biosparge performance monitoring, a VAP boring was completed adjacent to the 2013 remedial investigation (RI) boring VAP-P2-JO68 near the northern Plant 2 boundary. The results confirmed the 2013 RI results and boring SB-P2-JO68 was converted to performance monitoring well MW-21-142. Well MW-21-142 was sampled in November and December 2021 with results of 104 and 91 µg/L, respectively.

The monitoring well was constructed with a 5-foot stainless-steel wire-wrapped 0.010-slot screen and 2-inch PVC riser. An appropriate sand pack was placed around the screen interval (set from 71.5-76.5 feet bgs) to a depth of 2 feet above the well screen followed by 1 foot of choker sand and then bentonite grout to grade. The well was completed with a steel flush-mount cover and locking cap. Additional well construction details can be found in **Attachment 1**. The new monitoring well was developed using surge-and-purge methods until reasonably free of fine-grained material.

## Plant 2 PFAS Area 1,4-Dioxane Investigation

Well MW-20-130 is a double-cased weathered bedrock monitoring well that was installed in July 2020 to evaluate the potential for vertical migration of PFAS from the perched zone within the Plant 2 PFAS source area. The new weathered bedrock well was initially sampled for 1,4-dioxane during December 2020 and contained a concentration of 61 µg/L. Monitoring well MW-20-130 was sampled again in June of 2021 and contained a 1,4-dioxane concentration of 115 µg/L. PFOS and PFOA have not been detected in MW-20-130 despite elevated concentrations of PFOS and PFOA in the overlying perched groundwater. VAP sampling of the weathered bedrock using a rotary sonic drill rig was proposed to further characterize the 1,4-dioxane detected in MW-20-130. The installation of a perched monitoring well (MW-21-139) in this area was completed to evaluate the presence of 1,4-dioxane within the perched zone and aid in evaluating if concentrations detected in MW-20-130 are related to localized leaching or migration from another source area (e.g., Plant 2 LNAPL area). The locations of the perched and weathered bedrock monitoring well locations are shown on **Figure 1**.

### Perched Monitoring Well Installation

One perched monitoring well (MW-21-139) was installed within the perched PFAS source area, approximately 10 feet north of weathered bedrock monitoring well MW-20-130 using a rotary sonic drill rig. Continuous soil cores were obtained from the ground surface to a depth of 17 feet bgs. An Arcadis geologist logged and described the soils in accordance with the Arcadis Soil Description Standard Operating Procedures. Soil Boring Logs were generated based on the field descriptions and are included in **Attachment 1**.

The monitoring well was constructed with a 5-foot stainless-steel wire-wrapped 0.010-slot screen and 2-inch PVC riser. An appropriate sand pack was placed around the screen interval (set from 7-12 feet bgs) to a depth of 1 foot above the well screen followed by 1 foot of choker sand and then bentonite grout to grade. The well was completed with a steel flush-mount cover and locking cap. Additional well construction details can be found in **Attachment 1**. The new monitoring well was developed using surge-and-purge methods until reasonably free of fine-grained material.

Following development, the new monitoring well was sampled on December 1, 2021, during the fourth quarter site-wide routine groundwater sampling event using low-flow sampling methods. A sample was submitted to Merit for 1,4-dioxane analysis using USEPA Method 8260 SIM. A 1,4-dioxane concentration of 4 µg/L was detected in perched monitoring well MW-21-139, which is significantly lower than the 1,4-dioxane concentrations observed in weathered bedrock at MW-20-130 suggesting that leakage from the overlying perched zone is not the source of 1,4-dioxane at well MW-20-130. It is assumed that the 1,4-dioxane in weathered bedrock has migrated to the Plant 2 PFAS source area from the Plant 2 LNAPL source area as shown on **Figure 1**. The new monitoring well will be integrated into the revised Interim Groundwater Monitoring Plan for PFAS and 1,4-dioxane monitoring (Arcadis 2019).

## Weathered Bedrock VAP Sampling

Three VAP borings were advanced into the weathered bedrock to the north (SB-A5.5-NT184), east (MW-21-141) and south (MW-21-140) of MW-20-130 using rotary-sonic drilling methods. At each location:

- Borings were advanced approximately 10 feet into the weathered bedrock to a depth of 72-77 feet bgs.
- Continuous soil cores were obtained from the ground surface to the target well depth at each boring location. A Arcadis geologist logged and described the soils in accordance with the Arcadis Soil Description Standard Operating Procedures. Soil Boring Logs were generated based on the field descriptions and are included in **Attachment 1**.
- VAP groundwater samples were collected from the weathered bedrock using a retractable stainless-steel screen and submersible pump.
- Groundwater samples were submitted to Merit for 1,4-dioxane analysis using USEPA Method 8260 SIM on a 24-hour turnaround time. Groundwater analytical laboratory reports are included in **Attachment 2**.
- The boreholes remained cased using the outer drill casing, pending analytical results.
- Following evaluation of the VAP groundwater analytical results, two of the three borings were converted to permanent weathered bedrock monitoring wells (MW-21-140 and MW-21-141) to be utilized as sentinel monitoring locations. Construction was completed following the same procedures and methods described above for the northern Plant 2 performance monitoring well. The remaining borehole (SB-A5.5-NT184) was abandoned by grouting from the bottom up using a tremie pipe and bentonite grout.

All three VAP groundwater samples collected from the weathered bedrock were non-detect for 1,4-dioxane. The new monitoring wells (MW-21-140 and MW-21-141), located downgradient of the MW-20-130, were sampled during the fourth quarter groundwater monitoring event in December 2021 and 1,4-dioxane was not-detected in either well. These results show 1,4-dioxane is delineated to the south and east of MW-20-130. Based on these results and the current operation of the lower 1,4-dioxane biosparge system at the site, no further investigation of the weathered bedrock is warranted at this time. The new monitoring wells (MW-21-140 and MW-21-141) will be added to the IGMP and initially sampled on a semi-annual basis.

Should you have any questions regarding the completed work, please contact David Favero at 217-741-6235 or Patrick Curry at 810-225-1926.

Ms. Christine Matlock  
EGLE  
January 27, 2022

## **References:**

Arcadis. 2019. Revised Interim Groundwater Monitoring Work Plan – 2019. RACER Trust, Plants 2, 3, & 6, Lansing, Michigan. October 28.

Arcadis. 2020. Southeast Plant 2 PFAS Investigation Summary Memo – Phases 1 & 2. RACER Trust, Lansing, Michigan, Plant 2. December 7.

Arcadis. 2021. 1,4-Dioxane Monitoring Well Installation and Test Well Abandonment Work Plan. RACER Trust, Plants 2 and 3, Lansing, Michigan. August 11, 2021.

Enclosures:

## **Tables**

- 1 Summary of Groundwater Analytical Data

## **Figures**

- 1 Summary of VAP Boring and Monitoring Well Locations

## **Attachments**

- 1 Soil Boring Logs
- 2 Groundwater Analytical Laboratory Reports

# Tables

**Table 1**  
**Summary of Groundwater Analytical Data**  
**2021 Semi-Annual Groundwater Report**  
**RACER Trust Plant 2 - Lansing, Michigan**

Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-21-139 (SB-P2-OL185) 12/01/21 MW-21-139_120121 7-12	SB-A5.3-PH183 11/01/21 SB-A5.3-PH183_67-72 67-72	MW-21-140 (SB-A5.3-PH182) 12/03/21 MW-21-140_120321 67-72
<b>Field</b>						
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.69	--	7.00
Conductivity	--	--	mS/cm	0.76	--	0.60
Turbidity	--	--	NTU	0.02	--	12.30
Dissolved oxygen (DO)	--	--	mg/L	0.20	--	0.34
Temperature	--	--	Deg C	10.7	--	11.0
Oxidation reduction potential (ORP)	--	--	millivolts	-106.9	--	27.7
<b>Volatile Organics (via EPA Method 8260B SIM)</b>						
1,4-Dioxane	7.2	280	µg/L	4	<1	<1

See notes on last page.

**Table 1**  
**Summary of Groundwater Analytical Data**  
**2021 Semi-Annual Groundwater Report**  
**RACER Trust Plant 2 - Lansing, Michigan**

Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	SB-A5.6-00211 11/02/21 SB-A5.6-00211_72-77 72-77	MW-21-141 (SB-A5.6-00211) 12/01/21 MW-21-141_120121 72-77	SB-P2-JO68 11/02/21 SB-P2-JO68_71.5-76.5 71.5-76.5
<b>Field</b>						
pH	6.5 to 8.5	6.5 to 9.0	s.u.	--	6.83	--
Conductivity	--	--	mS/cm	--	0.85	--
Turbidity	--	--	NTU	--	196.00	--
Dissolved oxygen (DO)	--	--	mg/L	--	0.69	--
Temperature	--	--	Deg C	--	8.0	--
Oxidation reduction potential (ORP)	--	--	millivolts	--	-4.0	--
<b>Volatile Organics (via EPA Method 8260B SIM)</b>						
1,4-Dioxane	7.2	280	µg/L	<1	<1	104

See notes on last page.

**Table 1**  
**Summary of Groundwater Analytical Data**  
**2021 Semi-Annual Groundwater Report**  
**RACER Trust Plant 2 - Lansing, Michigan**



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-21-142 (SB-P2-JO68) 12/03/21 MW-21-142_120321 71.5-76.5	SB-A5.5-NT184 10/28/21 SB-A5.5-NT184_63-68 63-68	SB-P2-KG71 10/26/21 SB-P2-KG71_68-73 68-73
<b>Field</b>						
pH	6.5 to 8.5	6.5 to 9.0	s.u.	6.91	--	--
Conductivity	--	--	mS/cm	1.38	--	--
Turbidity	--	--	NTU	39.00	--	--
Dissolved oxygen (DO)	--	--	mg/L	0.30	--	--
Temperature	--	--	Deg C	11.7	--	--
Oxidation reduction potential (ORP)	--	--	millivolts	29.5	--	--
<b>Volatile Organics (via EPA Method 8260B SIM)</b>						
1,4-Dioxane	7.2	280	µg/L	91	<1	7

See notes on last page.

**Table 1**  
**Summary of Groundwater Analytical Data**  
**2021 Semi-Annual Groundwater Report**  
**RACER Trust Plant 2 - Lansing, Michigan**

Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	SB-P2-KH75 11/03/21 SB-P2-KH75_67-72 67-72	SB-P2-KH75 11/04/21 SB-P2-KH75_74-79 74-79	SB-P2-KH79 10/26/21 SB-P2-KH79_72-77 72-77
<b>Field</b>						
pH	6.5 to 8.5	6.5 to 9.0	s.u.	--	--	--
Conductivity	--	--	mS/cm	--	--	--
Turbidity	--	--	NTU	--	--	--
Dissolved oxygen (DO)	--	--	mg/L	--	--	--
Temperature	--	--	Deg C	--	--	--
Oxidation reduction potential (ORP)	--	--	millivolts	--	--	--
<b>Volatile Organics (via EPA Method 8260B SIM)</b>						
1,4-Dioxane	7.2	280	µg/L	<1	12	11

See notes on last page.

**Table 1**  
**Summary of Groundwater Analytical Data**  
**2021 Semi-Annual Groundwater Report**  
**RACER Trust Plant 2 - Lansing, Michigan**

Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	SB-P2-KH83 11/05/21 SB-P2-KH83_72-77 72-77	SB-P2-KH87 10/26/21 SB-P2-KH87_72-77 72-77
<b>Field</b>					
pH	6.5 to 8.5	6.5 to 9.0	s.u.	--	--
Conductivity	--	--	mS/cm	--	--
Turbidity	--	--	NTU	--	--
Dissolved oxygen (DO)	--	--	mg/L	--	--
Temperature	--	--	Deg C	--	--
Oxidation reduction potential (ORP)	--	--	millivolts	--	--
<b>Volatile Organics (via EPA Method 8260B SIM)</b>					
1,4-Dioxane	7.2	280	µg/L	<1	2
<i>See notes on last page.</i>					

**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 (Updated June 25, 2018)

**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) and 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

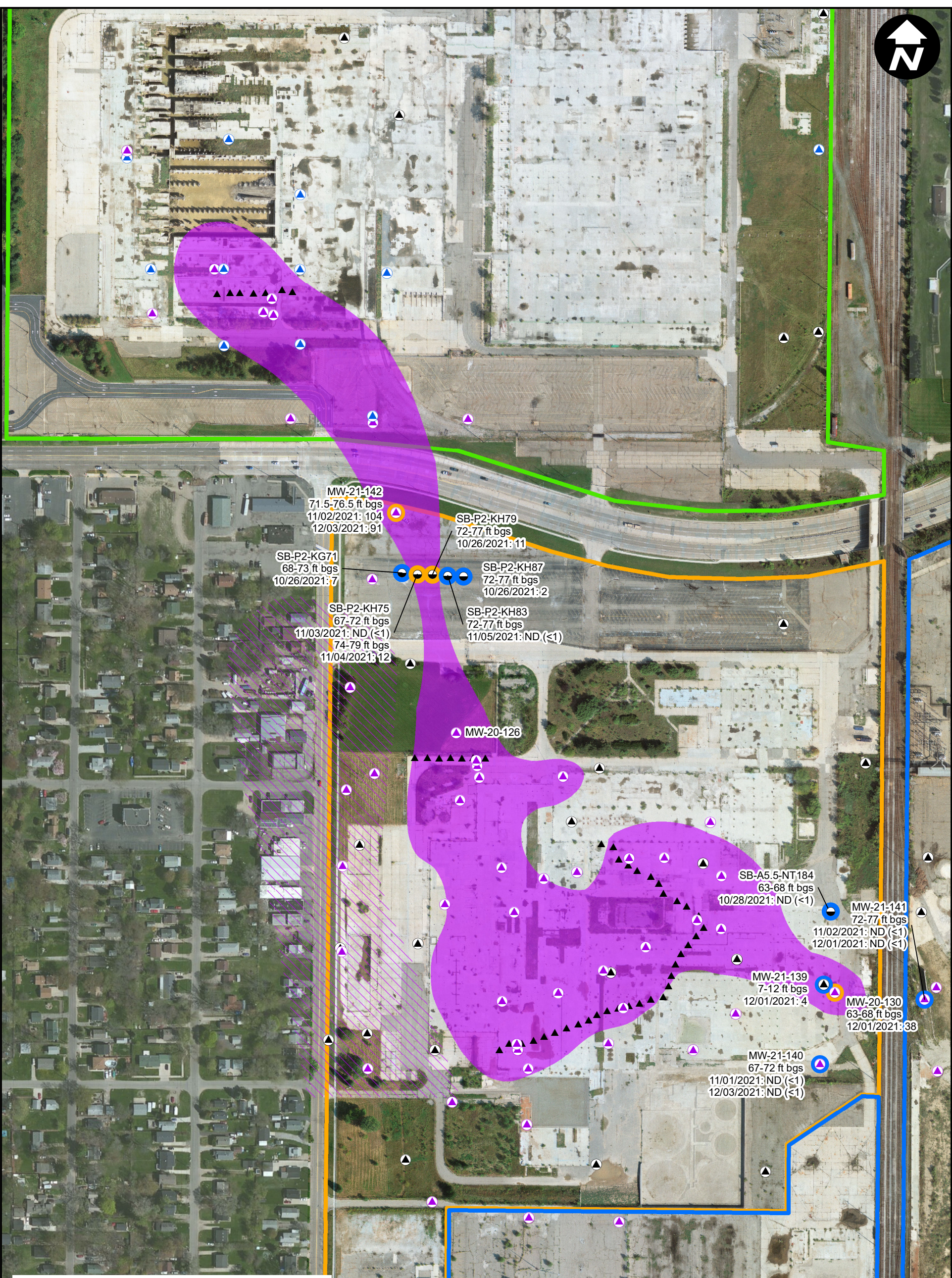
Deg. C. = degrees Celsius

EGLE = Michigan Department of Environment, Great Lakes, and Energy

3SI Criteria

e used for comparison with all VOC and Inorganic data and revised

# Figures



CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: A. VILLHAUER TR: PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl  
T:\\_ENV\RACER\Buffalo\MXDs\2021 Lower 1,4-Dioxane Memo\Figure 1 - VAP Boring and Monitoring Well Locations.mxd PLOTTED: 1/26/2022 11:03:41 AM BY: MJoye

**Legend**

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

**PLANT BOUNDARIES**

- ▭ PLANT 2
- ▭ PLANT 3
- ▭ PLANT 6

**NOTES:**

ANALYTICAL DATA FROM OCTOBER 26 THROUGH DECEMBER 3, 2021 ARE POSTED.

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

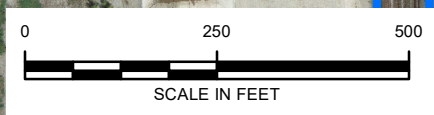
ALL ANALYTICAL DATA IS IN ug/L.

DW: EGLE Part 201 RESIDENTIAL DRINKING WATER CRITERIA

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

EPA: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ug/L: MICROGRAMS PER LITER



RACER TRUST  
PLANTS 2, 3 & 6  
LANSING, MICHIGAN

**VAP BORING AND  
MONITORING WELL LOCATIONS**

# Attachment 1

## Soil Boring Logs

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/27/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 10/27/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.3	(0.0-1.0') CONCRETE.		(0.0-0.5') Concrete Well Pad	
2			84		0.2	(1.0-6.0') SAND, medium, subrounded; little silt; trace granules, subrounded; well sorted; moist; dark yellowish brown (10YR 4/4).		(0.0-27.0') 6.0" dia. drilled hole	
3					0.0				
4					0.0				
5					0.0				
6					0.0				
7					0.0	(6.0-7.0') CLAY, medium plasticity, slow dilatancy; little silt; trace to little sand, fine to medium, subrounded; moist to wet; stiff; very dark gray (10YR 3/1).			
8					0.0	(7.0-9.0') SAND, medium, subrounded; little silt; trace granules, subrounded; trace pebbles, small, subrounded; poorly sorted; moist; dark yellowish brown (10YR 4/4).		(0.5-18.0') Filter Pack Sand	
9					0.0				
10					0.0	(9.0-14.0') CLAY, low plasticity, slow to no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; medium stiff to stiff; very dark gray (10YR 3/1).			
11					0.0				
12			120		0.0			(0.0-22.0') 2.0" dia. PVC casing	
13					0.0				
14					0.0				
15					0.0	(14.0-20.0') CLAY, medium to high plasticity, no dilatancy; trace sand, very fine; trace granules, subrounded; trace pebbles, small to medium, subrounded; moist; soft; dark gray (10YR 4/1).			
16					0.0				
17					0.0				
18					0.0				
19					0.0			(18.0-19.0') Bentonite Pellets	
20					0.0			(19.0-20.0') Choker Sand	

Drilling Co.: Cascade Sampling Method: 10.0' Core Barrel  
 Driller: Chris Barden Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. bto.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: \_\_\_\_\_  
 North Coord.: \_\_\_\_\_  
 East Coord.: \_\_\_\_\_

SOIL BORING LOG - 2013 \ARCADIS\US\COM\OFFICE\DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/27/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 10/27/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	X		120		0.0		(20.0-24.0') CLAY, medium to low plasticity, no dilatancy; some sand, fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; dark gray (10YR 4/1).	(20.0-27.0') Filter Pack Sand	
22					0.0				
23					0.0				
24					0.0				
25					0.0		(24.0-27.0') SAND, fine to medium, subrounded; trace to little silt; well sorted; wet; dark grayish brown (10YR 4/2).	(22.0-27.0') 2.0" dia. Stainless-Steel 0.010-Slot Screen	
26					0.0				
27					0.0				
28					0.0				
29						End of boring at 27.0' bgs.			
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\COMMON\MONI\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\DATABASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/27/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 10/27/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.1	(0.0-0.6') CONCRETE.		(0.0-0.5') Concrete Well Pad	
2			84		0.1	(0.6-1.0') SAND, fine to medium, subrounded; little silt; trace granules, subrounded; trace pebbles, small, subrounded; poorly sorted; moist; brown (10YR 5/3). Note: Fill material.		(0.5-4.0') Bentonite Slurry	
3					0.0	(1.0-9.0') CLAY, medium to high plasticity, no dilatancy; trace sand, fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; grayish brown (10YR 5/2).		(0.0-17.0') 6.0" dia. drilled hole	
4					0.0			(0.0-7.0') 2.0" dia. PVC casing	
5					0.0			(4.0-5.0') Bentonite Pellets	
6					0.0			(5.0-6.0') Choker Sand	
7					0.0			(6.0-12.0') Filter Pack Sand	
8					0.0				
9					0.0			(7.0-12.0') 2.0" dia. Stainless-Steel 0.010-Slot Screen	
10					0.0	(9.0-9.6') SILT, nonplastic, rapid dilatancy; and SAND, very fine; trace clay; wet; grayish brown (10YR 5/2).			
11					0.0	(9.6-15.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; grayish brown (10YR 5/2).			
12			120		0.0			(12.0-13.5') Backfilled with Filter Pack Sand	
13					0.0				
14					0.0				
15					0.0			(13.5-17.0') Backfilled with Bentonite Chips	
16					0.0	(15.0-15.5') SILT, nonplastic, slow dilatancy; little sand, very fine; trace clay; moist to wet; grayish brown (10YR 5/2).			
17					0.0	(15.5-17.0') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; grayish brown (10YR 5/2).			
							End of boring at 17.0' bgs.		
18									
19									
20									

Drilling Co.: Cascade Sampling Method: 10.0' Core Barrel  
 Driller: Chris Barden Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): 9.0  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: \_\_\_\_\_  
 North Coord.: \_\_\_\_\_  
 East Coord.: \_\_\_\_\_

SOIL BORING LOG - 2013 \ARCADIS-US-COM\OFFICE\DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121821\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/01/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 45° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.0	(0.0-0.5')	GRASS/TOPSOIL.	(0.0-0.5')	Concrete Well Pad
2					0.0	(0.5-6.0')	SAND, very fine to fine, subrounded; little silt; trace granules, subrounded; well sorted; moist; yellowish brown (10YR 5/4).	(0.0-72.0') 6.0" dia. drilled hole	
3					0.0				
4			84		0.0				
5					0.0				
6					0.0				
7					0.0	(6.0-11.0')	CLAY, medium plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff to soft; grayish brown (10YR 5/2).		
8					0.0				
9					0.0				
10					0.0				
11					0.0				
12			120		0.0	(11.0-18.0')	CLAY, medium to high plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; gray (10YR 5/1).	(0.0-67.0') 2.0' dia. PVC casing	
13					0.0				
14					0.0				
15					0.0				
16					0.0				
17					0.0				
18					0.0				
19					0.0	(18.0-27.5')	CLAY, medium to high plasticity, no dilatancy; some silt; little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small, subrounded; moist; medium stiff to soft; gray (10YR 5/1).		
20					0.0				

Drilling Co.: Cascade Sampling Method: 10.0' Core Barrel  
 Driller: Chris Barden Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: \_\_\_\_\_  
 North Coor.: \_\_\_\_\_  
 East Coor.: \_\_\_\_\_

SOIL BORING LOG - 2013 \ARCADIS\US\COM\OFFICE\DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121821\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/01/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 45° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21					0.0		(18.0-27.5') CLAY, medium to high plasticity, no dilatancy; some silt; little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small, subrounded; moist; medium stiff to soft; gray (10YR 5/1).		
22			120		0.0				
23					0.0				
24					0.0				
25					0.0				
26					0.0				
27					0.0				
28					0.0		(27.5-28.0') SAND, very fine to fine, subrounded; little to some silt; well sorted; wet; pale brown (10YR 6/3).	(0.5-63.0') Bentonite Slurry	
29					0.0		(28.0-33.0') CLAY, low plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to medium, subrounded; moist; medium stiff; gray (10YR 5/1).		
30					0.0				
31					0.0				
32			120		0.0				
33					0.0		(33.0-35.0') SILT, low plasticity to nonplastic, slow dilatancy; trace clay; trace sand, very fine; wet; soft; gray (10YR 5/1).		
34					0.0				
35					0.0		(35.0-55.0') CLAY, medium to high plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to medium, subrounded; moist; stiff; gray (10YR 5/1).		
36					0.0				
37					0.0				
38					0.0				
39					0.0				
40					0.0				
41					0.0				

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121821\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/01/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 45° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
42			120		0.0		(35.0-55.0') CLAY, medium to high plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to medium, subrounded; moist; stiff; gray (10YR 5/1).		
43					0.0				
44					0.0				
45					0.0				
46					0.0				
47					0.0				
48			120		0.0			(0.5-63.0') Bentonite Slurry	
49					0.0				
50					0.0				
51					0.0				
52					0.0				
53					0.0				
54					0.0		(55.0-55.5') SAND, fine to coarse, subrounded; little granules, subrounded; little pebbles, small to large, subrounded; little silt; poorly sorted; moist; gray (10YR 5/1).		
55					0.0				
56					0.0		(55.5-56.0') CLAY, medium plasticity, no dilatancy; some silt; trace sand, fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry; stiff; gray (10YR 5/1).		
57					0.0				
58					0.0		(56.0-57.0') SILT, nonplastic, no dilatancy; and SAND, very fine; trace clay; trace granules, subrounded; moist; soft; gray (10YR 5/1).		
59					0.0				
60					0.0		(57.0-64.0') CLAY, low plasticity to nonplastic, no dilatancy; and SILT; trace to little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small, subrounded; dry; very stiff; gray (10YR 5/1). Note: Little fragments of small to large finely interbedded sandstone and shale present.		
61					0.0				
62			120		0.0				
					0.0				

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\11\COMMON\1\RACER LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 11/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/01/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 45° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well	
64	X				0.0		(64.0-67.0') SHALE; very dark gray (10YR 3/1). Note: Trace very fine sandstone laminations present.	(63.0-64.0') Bentonite Pellets		
65					0.0			(64.0-65.0') Choker Sand		
66					0.0			(65.0-72.0') Filter Pack Sand		
67					0.0					
68	X		60	SB-A5.3-PH182_67-72 @ 1350 on 11/01/21	0.0		(67.0-72.0') SHALE; very dark gray (10YR 3/1). Note: Some interbedded sandstone present.			
69					0.0					(67.0-72.0') 2.0" dia. Stainless-Steel 0.010-Slot Screen
70					0.0					
71					0.0					
72					0.0					
73						End of boring at 72.0' bgs.				
74										
75										
76										
77										
78										
79										
80										
81										
82										
83										
84										

Remarks:

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# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/01/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 45° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.0	SP	(0.0-2.0') SAND, very fine to fine, subrounded; little silt; trace granules, subrounded; trace pebbles, small to medium, subrounded; well sorted; moist; yellowish brown (10YR 5/4).	(0.0-0.5') Concrete Well Pad	Well
2				0.0					
3			84		0.0	MH	(2.0-18.0') CLAY, high plasticity, no dilatancy; little silt; little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; brown (10YR 5/3).	(0.0-77.0') 6.0" dia. drilled hole	
4				0.0					
5				0.0					
6				0.0					
7				0.0					
8				0.0					
9				0.0					
10				0.0					
11				0.0					
12			120	0.0					
13				0.0					
14				0.0					
15				0.0					
16				0.0					
17				0.0					
18				0.0	OH	(18.0-33.5') CLAY, medium to high plasticity, no dilatancy; some silt; little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; gray (10YR 5/1).	(0.5-68.0') Bentonite Slurry		
19				0.0					
20				0.0					

Drilling Co.: Cascade Sampling Method: 10.0' Core Barrel  
 Driller: Chris Barden Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: \_\_\_\_\_  
 North Coor.: \_\_\_\_\_  
 East Coor.: \_\_\_\_\_

SOIL BORING LOG - 2013 \ARCADIS-US-COM\OFFICE\DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/01/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 45° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well		
21					0.0	[Diagonal Hatching]	(18.0-33.5') CLAY, medium to high plasticity, no dilatancy; some silt; little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; gray (10YR 5/1).				
22			120		0.0						
23					0.0						
24					0.0						
25					0.0						
26					0.0						
27					0.0						
28					0.0	[Diagonal Hatching]					
29					0.0						
30					0.0						
31					0.0						
32			120		0.0						
33					0.0						
34					0.0						
35					0.0	[Dotted Pattern]	(33.5-35.5') SAND, very fine to fine, subrounded; little silt; well sorted; wet; pale brown (10YR 6/3).	(0.5-68.0') Bentonite Slurry			
36					0.0						
37					0.0						
38					0.0	[Vertical Lines]	(35.5-36.5') CLAY, high plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; gray (10YR 5/1).				
39					0.0						
40					0.0						
41					0.0	[Diagonal Hatching]	(36.5-39.0') SILT, low plasticity to nonplastic, slow dilatancy; little sand, very fine; trace clay; wet; soft; grayish brown (10YR 5/2).				
					0.0						
					0.0	[Diagonal Hatching]	(39.0-52.5') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to very large, subrounded; dry to moist; very stiff; gray (10YR 5/1).				

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/01/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 45° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
42			120		0.0		(39.0-52.5') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to very large, subrounded; dry to moist; very stiff; gray (10YR 5/1).		
43					0.0				
44					0.0				
45					0.0				
46					0.0				
47					0.0				
48			120		0.0			(0.5-68.0') Bentonite Slurry	
49					0.0				
50					0.0				
51					0.0				
52					0.0				
53					0.0				
54					0.0				
55					0.0				
56					0.0				
57					0.0				
58					0.0		(57.0-59.0') CLAY, low to medium plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry; stiff; gray (10YR 5/1).		
59					0.0				
60					0.0				
61					0.0				
62					0.0				
62			120		0.0		(59.0-65.0') SILT, low plasticity to nonplastic, no dilatancy; little clay; little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry; stiff; gray (10YR 5/1).		

Remarks:

SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 11/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/01/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 45° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
64					0.0		(59.0-65.0') SILT, low plasticity to nonplastic, no dilatancy; little clay; little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry; stiff; gray (10YR 5/1).		
65					0.0				
66					0.0		(65.0-77.0') SANDSTONE, very fine; light gray (10YR 7/2).	(0.5-68.0') Bentonite Slurry	
67					0.0				
68					0.0			(68.0-69.0') Bentonite Pellets	
69			60		0.0			(69.0-70.0') Choker Sand	
70					0.0				
71					0.0			(70.0-77.0') Filter Pack Sand	
72					0.0		End of boring at 72.0' bgs.		
73					0.0				
74					0.0			(72.0-77.0') 2.0" dia. Stainless-Steel 0.010-Slot Screen	
75			60	SB-A5.6-OO211_72-77 @ 0955 on 11/02/21	0.0				
76					0.0				
77					0.0				
78									
79									
80									
81									
82									
83									
84									

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS-US-CO\OFFICE\DATA\NOV\14\COMMON\1\RACER LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/02/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 43° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.0		(0.0-0.5') ASPHALT.	(0.0-0.5') Concrete Well Pad	
2			84		0.0		(0.5-8.5') CLAY, low plasticity, no dilatancy; and SILT; little to some sand, fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; medium stiff to stiff; dark grayish brown (10YR 4/2) to brown (10YR 5/3). Note: Trace concrete fragments present.		
3					0.0				
4					0.0				
5					0.0			(0.0-77.0') 6.0" dia. drilled hole	
6					0.0				
7					1.1				
8					1.9				
9					6.3		(8.5-16.5') CLAY, nonplastic to low plasticity, no dilatancy; little silt; moist; soft; gray (10YR 5/1). Note: Organic-rich interval, dark brown (10YR 3/3) present from 8.5-10.5' bgs.	(0.5-67.5') Bentonite Slurry	
10					6.6				
11					7.1				
12			120		22.1			(0.0-71.5') 2.0" dia. PVC casing	
13					4.6				
14					2.1				
15					0.1				
16					0.1				
17					0.0		(16.5-17.0') SAND, fine to medium, subrounded; trace to little sand, sorace, subrounded; trace granules, subrounded; poorly sorted; wet; gray (10YR 6/1).		
18					0.0		(17.0-23.5') CLAY, low plasticity, no dilatancy; little to some silt; trace sand, fine, subrounded; trace granules, subrounded; trace pebbles, small, subrounded; moist; soft; gray (10YR 5/1).		
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: 10.0' Core Barrel  
 Driller: Chris Barden Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: \_\_\_\_\_  
 North Coord.: \_\_\_\_\_  
 East Coord.: \_\_\_\_\_

SOIL BORING LOG - 2013 \ARCADIS\US\COMMON\MONITORING\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/02/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 43° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21					0.0		(17.0-23.5') CLAY, low plasticity, no dilatancy; little to some silt; trace sand, fine, subrounded; trace granules, subrounded; trace pebbles, small, subrounded; moist; soft; gray (10YR 5/1).	(0.5-67.5') Bentonite Slurry	
22		120		0.0					
23				0.0					
24				0.0		(23.5-25.0') SAND, fine to coarse, subrounded; little granules, subrounded; little pebbles, small to large, subrounded; little silt; poorly sorted; wet; grayish brown (10YR 5/2).			
25				0.0					
26				0.0		(25.0-34.0') CLAY, medium plasticity, no dilatancy; some silt; little sand, fine, subrounded; trace granules, subrounded; trace pebbles, small to medium, subrounded; dry to moist; medium stiff; gray (10YR 5/1).			
27				0.0					
28				0.0					
29				0.0					
30				0.0					
31				0.0					
32		120		0.0					
33				0.0					
34				0.0					
35				0.0					
36				0.0					
37				0.0		(34.0-44.0') CLAY, low plasticity, no dilatancy; and SILT; some sand, fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; gray (10YR 5/1).			
38				0.0					
39				0.0					
40				0.0					
41				0.0					

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\11\COMMON\MON\1\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\DATABASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/02/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 43° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
42			120		0.0	[Diagonal Hatching]	(34.0-44.0') CLAY, low plasticity, no dilatancy; and SILT; some sand, fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; gray (10YR 5/1).		[Black Bar]
43				0.0					
44				0.0					
45				0.0	[Dotted Pattern]	(44.0-46.5') SAND, fine, subrounded; trace silt; well sorted; wet; grayish brown (10YR 5/2).			
46				0.0					
47					0.0	[Diagonal Hatching]	(46.5-52.0') CLAY, medium plasticity, no dilatancy; some silt; little sand, fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; gray (10YR 5/1).		
48				0.0					
49				0.0					
50					0.0	[Diagonal Hatching]	(52.0-61.0') SAND, very fine to fine, subrounded; little silt; trace sand, medium, subrounded; trace granules, subrounded; trace pebbles, small, subrounded; poorly sorted; dry; light gray (10YR 7/2).		
51				0.0					
52			120		0.0				
53					0.0	[Dotted Pattern]	(0.5-67.5') Bentonite Slurry		
54				0.0					
55				0.0					
56					0.0	[Dotted Pattern]			
57				0.0					
58				0.0					
59					0.0	[Dotted Pattern]			
60				0.0					
61				0.0					
62			120		0.0	[Vertical Lines]	(61.0-62.0') SILT, nonplastic, slow dilatancy; little to some sand, fine, subrounded; trace clay; moist to wet; medium stiff; gray (10YR 5/1).		
					0.0	[Vertical Lines]			

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 11/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/02/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/08/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 43° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
64					0.0		(62.0-71.5') SILT, low plasticity, no dilatancy; some clay; trace to little sand, very fine; trace granules, subrounded; trace pebbles, small to very large, subrounded; dry to moist; hard; gray (10YR 5/1).	(0.5-67.5') Bentonite Slurry	
65				0.0					
66				0.0					
67				0.0					
68					0.0		(67.5-68.5') Bentonite Pellets		
69				0.0		(68.5-69.5') Choker Sand			
70					0.0		(69.5-77.0') Filter Pack Sand		
71				0.0		Note: Little sandstone and shale fragments, small to large, starting at 70.0' bgs.			
72		120		SB-P2-JO68_71.5-76.5 @ 1510 on 11/02/21	0.0	(71.5-77.0') SANDSTONE.			
73					0.0		(71.5-76.5') 2.0" dia. Stainless-Steel 0.010-Slot Screen		
74					0.0				
75					0.0				
76					0.0				
77					0.0				
78							End of boring at 77.0' bgs.		
79									
80									
81									
82									
83									
84									

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS-US-CO\OFFICE\DATA\NOV\MI\COMMON\1\RACER LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/28/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/05/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.1		(0.0-1.0') CONCRETE.		
2			84		0.0		(1.0-9.0') SAND, very fine to fine, subrounded; some silt; little clay; trace granules, subrounded; trace pebbles, small, subrounded; poorly sorted; moist to wet; yellowish brown (10YR 5/4).		
3					0.0				
4					0.0				
5					0.0				
6					0.0				
7					0.0				
8					0.0				
9					0.0				
10					0.0		(9.0-14.0') CLAY, medium to high plasticity, no dilatancy; some silt; little sand, very fine to fine, subrounded; little granules, subrounded; little pebbles, small to large, subrounded; moist; soft; grayish brown (10YR 5/2).	(0.0-72.0') Backfilled with Bentonite Chips	
11				0.0					
12			120		0.0				
13					0.0				
14					0.0				
15					0.0		(14.0-20.5') CLAY, medium plasticity, no dilatancy; some silt; little sand, very fine to fine, subrounded; little granules, subrounded; little pebbles, small to large, subrounded; dry to moist; stiff; grayish brown (10YR 5/2).		
16					0.0				
17					0.0				
18					0.0				
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: 10.0' Core Barrel  
 Driller: Chris Barden Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: \_\_\_\_\_  
 North Coor.: \_\_\_\_\_  
 East Coor.: \_\_\_\_\_

SOIL BORING LOG: 2013 \ARCADIS\US\COMMON\MONITORING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/28/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/05/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21					0.0		(20.5-23.5') SAND, very fine to fine, subrounded; little silt; well sorted; wet; pale brown (10YR 6/3).		
22			120	0.0					
23				0.0					
24					0.0		(23.5-31.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff to soft; grayish brown (10YR 5/2).		
25				0.0					
26				0.0					
27					0.0				
28				0.0					
29				0.0					
30					0.0				
31				0.0					
32			120	0.0					
33					0.0				
34				0.0					
35				0.0					
36					0.0				
37				0.0					
38				0.0					
39					0.0				
40				0.0					
41				0.0					

(0.0-72.0')  
Backfilled with  
Bentonite  
Chips

Remarks:

SOIL BORING LOG: 2013 \ARCADIS-US-COM\OFFICE\DATA\NOV\COMMON\MON\BACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/28/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/05/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
42	X		120		0.0		(31.0-53.0') CLAY, medium plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; grayish brown (10YR 5/2).		
43					0.0				
44					0.0				
45					0.0				
46					0.0				
47					0.0				
48					0.0				
49	X		120		0.0			(0.0-72.0') Backfilled with Bentonite Chips	
50					0.0				
51					0.0				
52					0.0				
53					0.0				
54					0.0				
55					0.0				
56					0.0				
57					0.0				
58					0.0				
59	0.0								
60	X		120		0.0		(53.0-53.5') SAND, fine to coarse, subrounded; little granules, subrounded; little pebbles, small to large, subrounded; little silt; poorly sorted; dry; gray (10YR 5/1).		
61					0.0				
62					0.0				
63					0.0				
64	X		120		0.0		(53.5-57.0') CLAY, low plasticity, no dilatancy; some silt; trace to little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; very stiff; dark gray (10YR 4/1). Note: Trace small to large fragments of sandstone, very fine, light gray (10YR 7/1).		
65					0.0				
66					0.0				
67					0.0				
68	X		120		0.0		(57.0-60.0') SILT, nonplastic, no dilatancy to slow dilatancy; and SAND, very fine; trace clay; trace granules, subrounded; trace pebbles, small, subrounded; moist; medium stiff; pale brown (10YR 6/3).		
69					0.0				
70					0.0				
71					0.0				
72	X		120		0.0		(60.0-63.5') CLAY, low plasticity, no dilatancy; and SILT; little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small, subrounded; dry; very stiff; dark gray (10YR 4/1). Note: Little fragments of small to large finely interbedded sandstone and shale.		
73					0.0				
74					0.0				
75					0.0				

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 11/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/28/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/05/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
64				SB-A5.5-NT184_63-68 @ 1235 on 10/28/21	0.0		(63.5-64.0') SANDSTONE; and SHALE; gray (10YR 5/1). Note: Finely interbedded.	(0.0-72.0') Backfilled with Bentonite Chips	
65			0.0			(64.0-66.0') SANDSTONE, very fine; light gray (10YR 7/1). Note: Trace very fine shale laminations are present.			
66			0.0						
67			0.0			(66.0-68.0') SHALE; very dark gray (10YR 3/1). Note: Trace very fine sandstone laminations are present.			
68					0.0				
69			60		0.0		(68.0-72.0') SANDSTONE, very fine; light gray (10YR 7/1).		
70					0.0				
71					0.0				
72					0.0				
73							End of boring at 72.0' bgs.		
74									
75									
76									
77									
78									
79									
80									
81									
82									
83									
84									

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS-US-CO\OFFICE\DATA\NOV\COMMON\184\LOGS\RACER LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/25/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 10/25/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 45° F, Rainy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.2		(0.0-0.5') ASPHALT.		
2			84		0.1		(0.5-3.5') CLAY, medium plasticity, no dilatancy; some silt; little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; grayish brown (10YR 5/2).		
3					0.0				
4					0.0		(3.5-4.0') SAND, medium, subrounded; little silt; trace to little granules, subrounded; trace to little pebbles, small to medium, subrounded; poorly sorted; dry to moist; light yellowish brown (10YR 6/4).		
5					0.0		(4.0-11.0') CLAY, medium to high plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; brown (10YR 5/3).		
6					0.0				
7					0.0				
8					0.0			(0.0-73.0') Backfilled with Bentonite Chips	
9					0.0				
10					0.0				
11					0.0				
12			120		0.0		(11.0-26.5') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; gray (10YR 5/1).		
13					0.0				
14					0.0				
15					0.0				
16					0.0				
17					0.0				
18					0.0				
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: 10.0' Core Barrel  
 Driller: Chris Barden Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: \_\_\_\_\_  
 North Coor.: \_\_\_\_\_  
 East Coor.: \_\_\_\_\_

SOIL BORING LOG - 2013 \ARCADIS\US\COM\OFFICE\DATA\ANNOV\HICOMMON\BACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121821\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/25/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 10/25/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 45° F, Rainy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21					0.0		(11.0-26.5') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; gray (10YR 5/1).		
22			120		0.0				
23					0.0				
24					0.0				
25					0.0				
26					0.0				
27					0.0		(26.5-27.0') SAND, very fine to fine, subrounded; some silt; trace granules, subrounded; trace pebbles, small, subrounded; well sorted; wet; light brownish gray (10YR 6/2).	(0.0-73.0') Backfilled with Bentonite Chips	
28					0.0		(27.0-44.0') CLAY, medium to low plasticity, no dilatancy; and SILT; trace to little sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff to very stiff; gray (10YR 5/1).		
29					0.0				
30					0.0				
31					0.0				
32			120		0.0				
33					0.0				
34					0.0				
35					0.0				
36					0.0				
37					0.0				
38					0.0				
39					0.0				
40					0.0				
41					0.0				

Note: Small sand lens, very fine to fine; wet; light brownish gray (10YR 6/2) present from 33.0-33.2' bgs.

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS-US-COM\OFFICE\DATA\ANNOV\COMMON\MONI\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing

Date Started: 10/25/2021

Logger: A. Westhuis

Project Number: 30042872

Date Completed: 10/25/2021

Editor: C. Cisco

Project Location: Lansing, MI

Weather Conditions: 45° F, Rainy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
42	X		120		0.0	(27.0-44.0') CLAY, medium to low plasticity, no dilatancy; and SILT; trace to little sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff to very stiff; gray (10YR 5/1).			
43					0.0				
44					0.0				
45					X				0.0
46	0.0								
47	0.0								
48	X		120						0.0
49					0.0				
50					0.0				
51					X				0.0
52	0.0								
53	0.0								
54	X		120						0.0
55					0.0				
56					0.0				
57					X				0.0
58	0.0								
59	0.0								
60	X								0.0
61					0.0				
62					0.0				

(0.0-73.0')  
Backfilled  
with  
Bentonite  
Chips

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\ANNOV\H\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121821\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/25/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 10/25/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 45° F, Rainy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
64	X				0.0	CLAY	(58.0-68.0') CLAY, low plasticity to nonplastic, no dilatancy; and SILT; trace to little sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; very stiff; dark gray (10YR 4/1). Note: Trace fragments of small to large sandstone, very fine; light gray (10YR 7/1).		
65					0.0				
66					0.0				
67					0.0				
68	X			SB-P2-KG71_68-73 @ 0845 on 10/26/21	0.0	CLAY		(0.0-73.0') Backfilled with Bentonite Chips	
69					0.0				
70					0.0	SANDSTONE	(67.0-73.0') SANDSTONE, very fine; light gray (10YR 7/1). Note: Weathered with some small to large brittle fragments.		
71					0.0				
72					0.0				
73					0.0				
74							End of boring at 73.0' bgs.		
75									
76									
77									
78									
79									
80									
81									
82									
83									
84									

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS-US-CO\OFFICE\DATA\NOV\COMMON\MONI\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/03/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/09/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 40° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.0		(0.0-0.5') ASPHALT.		
2					0.0		(0.5-10.0') CLAY, medium to high plasticity, no dilatancy; some silt; trace sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; brown (10YR 5/3).		
3					0.0				
4		84			0.0				
5					0.0				
6					0.0				
7					0.0				
8					0.0		(10.0-28.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; gray (10YR 5/1).	(0.0-81.0') Backfilled with Bentonite Chips	
9					0.0				
10					0.0				
11					0.0				
12		120			0.0				
13					0.0				
14					0.0				
15					0.0				
16					0.0				
17					0.0				
18					0.0				
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: 10.0' Core Barrel  
 Driller: Chris Barden Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. bgs.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: \_\_\_\_\_  
 North Coor.: \_\_\_\_\_  
 East Coor.: \_\_\_\_\_

SOIL BORING LOG: 2013 \ARCADIS\US\COMMON\MONITORING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121821\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/03/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/09/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 40° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well	
21					0.0		(10.0-28.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; gray (10YR 5/1).			
22			84	0.0						
23				0.0						
24				0.0						
25				0.0						
26				0.0						
27				0.0						
28				0.0		(28.0-29.0') SAND, very fine to fine, subrounded; some silt; trace granules, subrounded; trace pebbles, small, subrounded; well sorted; wet; light brownish gray (10YR 6/2).	(0.0-81.0') Backfilled with Bentonite Chips			
29				0.0						
30				0.0		(29.0-43.0') CLAY, medium to low plasticity, no dilatancy; and SILT; trace to little sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; gray (10YR 5/1).				
31				0.0						
32			120	0.0						
33				0.0						
34				0.0						
35				0.0						
36				0.0						
37				0.0						
38				0.0						
39				0.0						
40				0.0						
41				0.0						

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\11\COMMON\MON\1\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/03/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/09/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 40° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
42	X		120		0.0		(43.0-52.0') SAND, very fine to fine, subrounded; trace to little silt; trace granules, subrounded; well sorted; dry; light gray (10YR 7/2).		
43					0.0				
44					0.0				
45					0.0				
46					0.0				
47					0.0				
48					0.0				
49	X		120		0.0		(52.0-54.0') SAND, fine to medium, subrounded; trace to little silt; trace granules, subrounded; trace pebbles, small, subrounded; well sorted; dry; light gray (10YR 7/2).	(0.0-81.0') Backfilled with Bentonite Chips	
50					0.0				
51					0.0				
52					0.0				
53					0.0				
54					0.0				
55					0.0				
56	X		120		0.0		(54.0-67.0') SILT, nonplastic to low plasticity, no dilatancy; and CLAY; trace to little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to very large, subrounded; dry to moist; very stiff; dark gray (10YR 4/1). Note: Trace small to large fragments of sandstone, very fine; light gray (10YR 7/1).		
57					0.0				
58					0.0				
59					0.0				
60					0.0				
61					0.0				
62					0.0				

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121821\_NEW ONLY.GPJ ARCADIS\_2013.GDT 11/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/03/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/09/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 40° F, Partly Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
64					0.0	[Diagonal Hatching]	(54.0-67.0') SILT, nonplastic to low plasticity, no dilatancy; and CLAY; trace to little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to very large, subrounded; dry to moist; very stiff; dark gray (10YR 4/1). Note: Trace small to large fragments of sandstone, very fine; light gray (10YR 7/1).	(0.0-81.0') Backfilled with Bentonite Chips	[Black Bar]
65				0.0					
66				0.0					
67				0.0					
68			60	SB-P2-KH75_67-72 @ 1555 on 11/03/21	0.0	[Dotted Pattern]	(67.0-81.0') SANDSTONE, very fine; light gray (10YR 7/1). Note: Trace very fine shale laminations present.		
69				0.0					
70				0.0					
71				0.0					
72			84	SB-P2-KH75_74-79 @ 0825 on 11/04/21	0.0	[Dotted Pattern]	(67.0-81.0') SANDSTONE, very fine; light gray (10YR 7/1). Note: Trace very fine shale laminations present.		
73				0.0					
74				0.0					
75				0.0					
76					0.0	[Dotted Pattern]	(67.0-81.0') SANDSTONE, very fine; light gray (10YR 7/1). Note: Trace very fine shale laminations present.		
77				0.0					
78				0.0					
79				0.0					
80			24		0.0	[Dotted Pattern]	(67.0-81.0') SANDSTONE, very fine; light gray (10YR 7/1). Note: Trace very fine shale laminations present.		
81				0.0					
82							End of boring at 81.0' bgs.		
83									
84									

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS-US-CO\OFFICE\DATA\NOV\HMC\COMMON\BACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 11/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/26/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/09/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.1		(0.0-0.5') ASPHALT.		
2			84		0.1		(0.5-8.0') CLAY, high plasticity, no dilatancy; some silt; trace sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; brown (10YR 5/3).		
3					0.0				
4					0.0				
5					0.0				
6					0.0				
7					0.0				
8					0.0				
9					0.0		(8.0-29.5') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; gray (10YR 5/1).		
10					0.0			(0.0-77.0') Backfilled with Bentonite Chips	
11					0.0				
12			120		0.0				
13					0.0				
14					0.0				
15					0.0				
16					0.0				
17					0.0				
18					0.0				
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: 10.0' Core Barrel  
 Driller: Chris Barden Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. bgs.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: \_\_\_\_\_  
 North Coor: \_\_\_\_\_  
 East Coor: \_\_\_\_\_

SOIL BORING LOG - 2013 \ARCADIS\US\COMMON\PROJECTS\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121821\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing

Date Started: 10/26/2021

Logger: A. Westhuis

Project Number: 30042872

Date Completed: 11/09/2021

Editor: C. Cisco

Project Location: Lansing, MI

Weather Conditions: 50° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21					0.0		(8.0-29.5') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; gray (10YR 5/1).		
22			120		0.0				
23					0.0				
24					0.0				
25					0.0				
26					0.0				
27					0.0				
28					0.0		(29.5-30.5') SAND, very fine to fine, subrounded; some silt; trace granules, subrounded; trace pebbles, small to medium, subrounded; poorly sorted; wet; light brownish gray (10YR 6/2).	(0.0-77.0') Backfilled with Bentonite Chips	
29					0.0				
30					0.0				
31					0.0				
32			120		0.0				
33					0.0				
34					0.0				
35					0.0		(30.5-31.5') CLAY, high plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; gray (10YR 5/1).		
36					0.0				
37					0.0				
38					0.0				
39					0.0				
40					0.0				
41					0.0				

Remarks:

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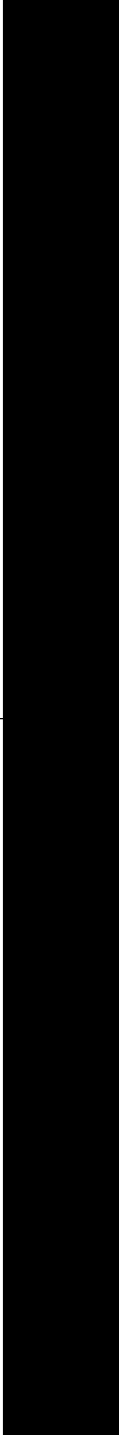




















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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/26/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/09/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
42			120		0.0		(33.0-43.0') CLAY, medium plasticity, no dilatancy; and SILT; trace to little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; gray (10YR 5/1).	(0.0-77.0') Backfilled with Bentonite Chips	
43					0.0		(43.0-53.0') SAND, very fine to fine, subrounded; little silt; trace granules, subrounded; well sorted; dry; light gray (10YR 7/2).		
44					0.0				
45					0.0				
46					0.0				
47					0.0				
48			120		0.0				
49					0.0				
50					0.0				
51					0.0				
52					0.0				
53					0.0				
54					0.0		(53.0-58.0') SAND, fine to medium, subrounded; little silt; trace granules, subrounded; trace pebbles, small to medium, subrounded; poorly sorted; dry; light gray (10YR 7/2).		
55					0.0				
56					0.0				
57					0.0				
58					0.0		(58.0-61.0') SAND, fine to medium, subrounded; some silt; little granules, subrounded; little pebbles, small to medium, subrounded; trace to little sand, coarse, subrounded; poorly sorted; dry; light gray (10YR 7/1) to grayish brown (10YR 5/2).		
59					0.0				
60					0.0				
61					0.0				
62			120		0.0				
					0.0				

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121921\_NEW ONLY.GPJ ARCADIS\_2013.GDT 11/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/26/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/09/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
64	X				0.0	(61.0-69.0') SILT, nonplastic to low plasticity, no dilatancy; and CLAY; trace to little sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; very stiff; dark gray (10YR 4/1). Note: Trace small to large fragments of sandstone, very fine; light gray (10YR 7/1).			
65					0.0				
66					0.0				
67					0.0				
68	X		120	SB-P2-KH79_72-77 @ 1355 on 10/26/21	0.0		(69.0-77.0') SANDSTONE, very fine; light gray (10YR 7/1). Note: Weathered with some small to large brittle fragments.	(0.0-77.0') Backfilled with Bentonite Chips	
69					0.0				
70					0.0				
71					0.0				
72					0.0				
73					0.0				
74					0.0				
75					0.0				
76					0.0				
77					0.0				
78							End of boring at 77.0' bgs.		
79									
80									
81									
82									
83									
84									

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\MI\COMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/04/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/09/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 40° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.0		(0.0-0.5') ASPHALT.		
2			84		0.0		(0.5-9.0') CLAY, high plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; brown (10YR 5/3).		
3					0.0				
4					0.0				
5					0.0				
6					0.0				
7					0.0				
8					0.0				
9					0.0				
10			120		0.0		(9.0-29.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; gray (10YR 5/1).	(0.0-77.0') Backfilled with Bentonite Chips	
11					0.0				
12					0.0				
13					0.0				
14					0.0				
15					0.0				
16					0.0				
17					0.0				
18					0.0				
19					0.0				
20					0.0				

Drilling Co.: Cascade Sampling Method: 10.0' Core Barrel  
 Driller: Chris Barden Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: \_\_\_\_\_  
 North Coor: \_\_\_\_\_  
 East Coor: \_\_\_\_\_

SOIL BORING LOG - 2013 \ARCADIS-US-COM\OFFICE\DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121821\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/04/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/09/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 40° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21					0.0		(9.0-29.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; gray (10YR 5/1).		
22			120		0.0				
23					0.0				
24					0.0				
25					0.0				
26					0.0				
27					0.0				
28					0.0		(29.0-31.0') CLAY, medium plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to medium, subrounded; moist; medium stiff to soft; gray (10YR 5/1).	(0.0-77.0') Backfilled with Bentonite Chips	
29					0.0				
30					0.0				
31					0.0		(31.0-31.5') SAND, very fine to fine, subrounded; some silt; well sorted; wet; light brownish gray (10YR 6/2).	(0.0-77.0') Backfilled with Bentonite Chips	
32			120		0.0		(31.5-45.0') CLAY, medium plasticity, no dilatancy; and SILT; trace to little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; medium stiff to stiff; gray (10YR 5/1).		
33					0.0				
34					0.0				
35					0.0				
36					0.0				
37					0.0				
38					0.0				
39					0.0				
40					0.0				
41					0.0				

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/04/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/09/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 40° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
42	X		120		0.0		(31.5-45.0') CLAY, medium plasticity, no dilatancy; and SILT; trace to little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; medium stiff to stiff; gray (10YR 5/1).		
43					0.0				
44					0.0				
45					0.0				
46					0.0				
47	X		120		0.0		(45.0-55.0') SAND, very fine to fine, subrounded; little silt; trace granules, subrounded; well sorted; dry; light gray (10YR 7/2).		
48					0.0				
49					0.0				
50					0.0				
51					0.0				
52					0.0				
53					0.0				
54					0.0				
55					0.0				
56					0.0				
57	X		120		0.0		(55.0-58.5') SAND, fine to medium, subrounded; some silt; trace to little sand, coarse, subrounded; poorly sorted; dry; light gray (10YR 7/1) to grayish brown (10YR 5/2).		
58					0.0				
59					0.0				
60					0.0				
61					0.0				
62	X		120		0.0		(58.5-68.0') SILT, nonplastic to low plasticity, no dilatancy; and CLAY; trace to little sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry; very stiff to hard; dark gray (10YR 4/1). Note: Trace small to large fragments of sandstone, very fine; light gray (10YR 7/1).		
63					0.0				
64					0.0				
65					0.0				
66					0.0				

(0.0-77.0')  
Backfilled  
with  
Bentonite  
Chips

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\COMMON\MONI\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 11/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 11/04/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 11/09/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 40° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
64					0.0	[Hatched Pattern]	(58.5-68.0') SILT, nonplastic to low plasticity, no dilatancy; and CLAY; trace to little sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry; very stiff to hard; dark gray (10YR 4/1). Note: Trace small to large fragments of sandstone, very fine; light gray (10YR 7/1).	(0.0-77.0') Backfilled with Bentonite Chips	[Black Bar]
65				0.0					
66				0.0					
67				0.0					
68				0.0	[Dotted Pattern]	(68.0-77.0') SANDSTONE, very fine; light gray (10YR 7/1).			
69				0.0					
70		60		0.0					
71				0.0					
72					0.0	[Black Bar]	End of boring at 77.0' bgs.	[Black Bar]	
73				0.0					
74				0.0					
75		30	SB-P2-KH83_72-77 @ 1330 on 11/05/21	0.0					
76				0.0					
77				0.0					
78									
79									
80									
81									
82									
83									
84									

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS-US-COM\OFFICE\DATA\NOV\COMMON\MONI\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/26/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 10/26/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.2		(0.0-0.5') ASPHALT.		
2			84		0.0		(0.5-6.0') CLAY, high plasticity, no dilatancy; some silt; trace sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; medium stiff; brown (10YR 5/3).		
3					0.0				
4					0.0				
5					0.0				
6					0.0				
7					0.0		(6.0-6.5') SAND, medium to coarse, subrounded; little silt; trace to little granules, subrounded; trace to little pebbles, small to medium, subrounded; poorly sorted; wet; brown (10YR 5/3).		
8					0.0		(6.5-16.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; gray (10YR 5/1).		
9					0.0				
10					0.0				
11					0.0				
12			120		0.0				
13					0.0				
14					0.0				
15					0.0				
16					0.0				
17					0.0		(16.0-16.5') SAND, very fine to fine, subrounded; little sand, medium to coarse, subrounded; trace granules, subrounded; trace pebbles, small, subrounded; poorly sorted; wet; grayish brown (10YR 5/2).		
18					0.0		(16.5-20.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; gray (10YR 5/1).		
19					0.0				
20					0.0				

(0.0-77.0')  
Backfilled with  
Bentonite  
Chips

Drilling Co.: Cascade Sampling Method: 10.0' Core Barrel  
 Driller: Chris Barden Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: \_\_\_\_\_  
 North Coor: \_\_\_\_\_  
 East Coor: \_\_\_\_\_

SOIL BORING LOG - 2013 \ARCADIS\US\COMMON\PROJECTS\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/26/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 10/26/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21					0.0		(20.0-22.0') SAND, very fine to fine, subrounded; little silt; well sorted; wet; pale brown (10YR 6/3).		
22			120		0.0		(22.0-34.0') CLAY, medium to high plasticity, no dilatancy; little to some silt; little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; gray (10YR 5/1).		
23					0.0				
24					0.0				
25					0.0				
26					0.0				
27					0.0				
28					0.0		(34.0-35.5') SAND, very fine to medium, subrounded; little to some silt; little granules, subrounded; little pebbles, small to medium, subrounded; trace sand, coarse, subrounded; poorly sorted; wet; light brownish gray (10YR 6/2).	(0.0-77.0') Backfilled with Bentonite Chips	
29					0.0				
30					0.0				
31					0.0				
32			120		0.0				
33					0.0				
34					0.0				
35					0.0				
36					0.0				
37					0.0				
38					0.0		(35.5-47.0') CLAY, medium plasticity, no dilatancy; and SILT; trace to little sand, very fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; gray (10YR 5/1).		
39					0.0				
40					0.0				
41					0.0				
					0.0				

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\COMMON\MON\BACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121021\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/26/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 10/26/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
42	X		120		0.0		(35.5-47.0') CLAY, medium plasticity, no dilatancy; and SILT; trace to little sand, very fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; gray (10YR 5/1).		
43					0.0				
44					0.0				
45					0.0				
46					0.0				
47					0.0				
48					X				
49	0.0								
50	0.0								
51	0.0								
52	0.0								
53	0.0								
54	0.0								
55	0.0								
56	0.0								
57	0.0								
58	X				0.0		(52.0-54.0') SILT; some sand, very fine; moist; grayish brown (10YR 5/2).		
59					0.0				
60					0.0				
61					0.0				
62					0.0				
63					0.0				
64	X		120		0.0		(54.0-55.5') SAND, fine, subrounded; little silt; well sorted; dry; light gray (10YR 7/2).		
65					0.0				
66					0.0				
67					0.0				
68					0.0				
69					0.0				
70	X				0.0		(55.5-58.0') CLAY, medium plasticity, no dilatancy; and SILT; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to medium, subrounded; moist; stiff; dark gray (10YR 4/1).		
71					0.0				
72					0.0				
73					0.0				
74					0.0				
75					0.0				
76	X				0.0		(58.0-70.0') SILT, nonplastic to low plasticity, no dilatancy; and CLAY; trace to little sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; very stiff; dark gray (10YR 4/1). Note: Trace small to large fragments of sandstone, very fine; light gray (10YR 7/1).		
77					0.0				
78					0.0				
79					0.0				
80					0.0				
81					0.0				

(0.0-77.0')  
Backfilled  
with  
Bentonite  
Chips

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\ANNOV\H\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_121821\_NEW ONLY.GPJ ARCADIS\_2013.GDT 12/20/21

# Soil Boring Log

Project Name: RACER Lansing Date Started: 10/26/2021 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 10/26/2021 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 50° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well		
64	X				0.0	(58.0-70.0')	(58.0-70.0') SILT, nonplastic to low plasticity, no dilatancy; and CLAY; trace to little sand, very fine to medium, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; very stiff; dark gray (10YR 4/1). Note: Trace small to large fragments of sandstone, very fine; light gray (10YR 7/1).				
65					0.0						
66					0.0						
67					0.0						
68	X		120	SB-P2-KH87_72-77 @ 1700 on 10/26/21	0.0	(70.0-77.0')	(70.0-77.0') SANDSTONE, very fine; light gray (10YR 7/1). Note: Weathered with some small to large brittle fragments.	(0.0-77.0') Backfilled with Bentonite Chips			
69					0.0						
70					0.0						
71					0.0						
72					0.0						
73					0.0						
74					0.0						
75					0.0						
76					0.0						
77					0.0						
78	X										
79											
80											
81											
82											
83											
84											

End of boring at 77.0' bgs.

Remarks:

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# Attachment 2

**Groundwater Analytical Laboratory Reports**



# Analytical Laboratory Report

Report ID: S29681.01(01)  
Generated on 10/27/2021

## Report to

---

Attention: Alex Villhauer  
Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:  
Email: alex.vilhauer@arcadis.com

Additional Contacts: Patrick Curry, Austin Westhuis

## 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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S29681.01  
Project: 30075941.04100 / RACER Lansing  
Collected Date(s): 10/26/2021  
Submitted Date/Time: 10/26/2021 09:22  
Sampled by: Austin Westhuis  
P.O. #: 30075941.04100

## Table of Contents

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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)

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.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## 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
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
S29681.01	SB-P2-KG71_68-73	Groundwater	10/26/21 08:45



# Analytical Laboratory Report

Lab Sample ID: S29681.01

Sample Tag: SB-P2-KG71\_68-73

Collected Date/Time: 10/26/2021 08:45

Matrix: Groundwater

COC Reference: 141639

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/27/21 16:45	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/27/21 13:41, Analyst: KAG

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:S29681

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04100 / RACER Lansing

Submitted: 10/26/2021 09:22 Login User: JRM

Attention: Alex Villhauer

Address: Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:

Email: alex.villhauer@arcadis.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 5.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: \_\_\_\_\_





# Analytical Laboratory Report

Report ID: S29718.01(01)  
Generated on 10/27/2021

## Report to

---

Attention: Alex Villhauer  
Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:  
Email: alex.vilhauer@arcadis.com

Additional Contacts: Patrick Curry, Austin Westhuis

## 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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S29718.01  
Project: 30075941.04100 / RACER Lansing  
Collected Date(s): 10/26/2021  
Submitted Date/Time: 10/26/2021 14:21  
Sampled by: Austin Westhuis  
P.O. #: 30075941.04100

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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.

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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.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## 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
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
S29718.01	SB-P2-KH79_72-77	Groundwater	10/26/21 13:55



# Analytical Laboratory Report

Lab Sample ID: S29718.01

Sample Tag: SB-P2-KH79\_72-77

Collected Date/Time: 10/26/2021 13:55

Matrix: Groundwater

COC Reference: 141640

### 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	10/27/21 16:45	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/27/21 14:01, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	11	1		ug/L	1	123-91-1	

# Merit Laboratories Login Checklist

Lab Set ID:S29718

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04100 / RACER Lansing

Submitted: 10/26/2021 14:21 Login User: MMC

Attention: Alex Villhauer

Address: Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:

Email: alex.villhauer@arcadis.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: \_\_\_\_\_



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 141640

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME: Alex Villhauer  
 COMPANY: Arcadis of Michigan, LLC  
 ADDRESS: 28550 Cabot Arvine, Suite 500  
 CITY: Novi STATE: MI ZIP CODE: 48377  
 PHONE NO.: 616-780-3277 FAX NO.: 248-994-2241 P.O. NO.:  
 E-MAIL ADDRESS: Alex.Villhauer@arcadis.com QUOTE NO.:

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

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME: 30075941.04100/PACER 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

1/4-dioxane USEPA Method 8260 SEM

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other MI  
 Special Instructions

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

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives								OTHER	Special Instructions
	DATE	TIME				NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER			
<u>29681.01</u>	<u>10/26/21</u>	<u>1355</u>	<u>SB-P2-KH79-72-77</u>	<u>GW</u>	<u>3</u>	<u>3</u>							<u>X</u>	<u>*24-Hour TAT*</u>	
<u>29718.01</u>															
<u>(MC)</u>															

RELINQUISHED BY: Austin Westhuis  Sampler DATE: 10/26/21 TIME: 1421  
 RECEIVED BY: Arcadis DATE: TIME:  
 RELINQUISHED BY: DATE: TIME:  
 RECEIVED BY: DATE: TIME:

RELINQUISHED BY: Merit Drop Box DATE: 10/26/21 TIME: 1421  
 RECEIVED BY: M. Calcutt DATE: 10/26/21 TIME: 1421  
 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



# Analytical Laboratory Report

Report ID: S29728.01(01)  
Generated on 10/28/2021

## Report to

---

Attention: Alex Villhauer  
Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:  
Email: alex.vilhauer@arcadis.com

Additional Contacts: Patrick Curry, Austin Westhuis

## 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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

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Lab Sample ID(s): S29728.01  
Project: 30075941.04100 / RACER Lansing  
Collected Date(s): 10/26/2021  
Submitted Date/Time: 10/27/2021 08:15  
Sampled by: Austin Westhuis  
P.O. #: 30075941.04100

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Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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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.

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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.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## 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
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
S29728.01	SB-P2-KH87_72-77	Groundwater	10/26/21 17:00



# Analytical Laboratory Report

Lab Sample ID: S29728.01

Sample Tag: SB-P2-KH87\_72-77

Collected Date/Time: 10/26/2021 17:00

Matrix: Groundwater

COC Reference: 141662

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.7	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/27/21 16:45	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/27/21 14:22, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	2	1		ug/L	1	123-91-1	

# Merit Laboratories Login Checklist

Lab Set ID:S29728

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04100 / RACER Lansing

Submitted: 10/27/2021 08:15 Login User: MMC

Attention: Alex Villhauer

Address: Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:

Email: alex.villhauer@arcadis.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 3.7 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |
| 11. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    |

## Bottle Conditions

- |     |  |   |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: \_\_\_\_\_





# Analytical Laboratory Report

Report ID: S29817.01(01)  
Generated on 10/29/2021

## Report to

---

Attention: Alex Villhauer  
Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:  
Email: alex.vilhauer@arcadis.com

Additional Contacts: Patrick Curry, Austin Westhuis

## 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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S29817.01  
Project: 30075941.04100 / RACER Lansing  
Collected Date(s): 10/28/2021  
Submitted Date/Time: 10/28/2021 13:30  
Sampled by: Austin Westhuis  
P.O. #: 30075941.04100

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Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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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."

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Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
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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
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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



# Analytical Laboratory Report

## 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
S29817.01	SB-A5.5-NT184_63-68	Groundwater	10/28/21 12:35



# Analytical Laboratory Report

Lab Sample ID: S29817.01

Sample Tag: SB-A5.5-NT184\_63-68

Collected Date/Time: 10/28/2021 12:35

Matrix: Groundwater

COC Reference: 141664

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.2	IR

## Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	10/29/21 10:00	BML	

## Organics - Volatiles

Method: SW8260B - SIM, Run Date: 10/29/21 13:08, Analyst: KAG

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:S29817

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04100 / RACER Lansing

Submitted: 10/28/2021 13:30 Login User: MMC

Attention: Alex Villhauer

Address: Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:

Email: alex.villhauer@arcadis.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 3.2
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: \_\_\_\_\_



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 141664

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Alex Villhauer  
 COMPANY Arcadis of Michigan, LLC  
 ADDRESS 28550 Cabot Drive, Suite 500  
 CITY No. Vi STATE MI ZIP CODE 48377  
 PHONE NO. 616-780-3277 FAX NO. P.O. NO.  
 E-MAIL ADDRESS Alex.Villhauer@arcadis.com QUOTE NO.

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

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME 30075941.04106/ACER Lansing SAMPLER(S) - PLEASE PRINT/SIGN NAME Austin Westhuis/Arcadis  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER

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

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	Certifications <input type="checkbox"/> OHIO VAP <input type="checkbox"/> Drinking Water <input type="checkbox"/> DoD <input type="checkbox"/> NPDES Project Locations <input type="checkbox"/> Detroit <input type="checkbox"/> New York <input checked="" type="checkbox"/> Other <u>MI</u> Special Instructions <u>* 24-Hour TAT *</u>
	DATE	TIME											
29817.01	10/28/21	1235	SB-A5.5-NT184-63-68	GW	3		3						

1,4-Dioxane USEPA Method 8260 SIM

RELINQUISHED BY: Austin Westhuis/Arcadis  Sampler DATE 10/28/21 TIME 1330  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

RELINQUISHED BY: Merit Amp Box DATE 10/28/21 TIME 1330  
 RECEIVED BY: M. Chilcote DATE 10/28/21 TIME 1330  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_ NOTES: TEMP. ON ARRIVAL 3.2  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_

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

\* Please also email results to: alex.villhauer@arcadis.com



# Analytical Laboratory Report

Report ID: S29912.01(01)  
Generated on 11/02/2021

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**Report to**

Attention: Alex Villhauer  
Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:  
Email: alex.villhauer@arcadis.com

Additional Contacts: Patrick Curry, Austin Westhuis

---

**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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

---

**Report Summary**

Lab Sample ID(s): S29912.01  
Project: 30075941.04100 / RACER Lansing  
Collected Date(s): 11/01/2021  
Submitted Date/Time: 11/01/2021 14:40  
Sampled by: Austin Westhuis  
P.O. #: 30075941.04100

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Maya Murshak  
Technical Director



# Analytical Laboratory Report

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Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
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G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
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E	EPA Methods
SM	Standard Methods
LN	Linear
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# Analytical Laboratory Report

## 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
S29912.01	SB-A5.3-PH182_67-72	Groundwater	11/01/21 13:50



# Analytical Laboratory Report

Lab Sample ID: S29912.01

Sample Tag: SB-A5.3-PH182\_67-72

Collected Date/Time: 11/01/2021 13:50

Matrix: Groundwater

COC Reference: 141663

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.3	IR

## Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/02/21 11:00	BML	

## Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/02/21 12:45, Analyst: KAG

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:S29912

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04100 / RACER Lansing

Submitted: 11/01/2021 14:40 Login User: MMC

Attention: Alex Villhauer

Address: Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:

Email: alex.villhauer@arcadis.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.3 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |
| 11. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    |

## Bottle Conditions

- |     |  |   |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: \_\_\_\_\_



**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Alex Villhauer  
 COMPANY Arcadis of Michigan, LLC  
 ADDRESS 28550 Cabot Drive, Suite 500  
 CITY Novi STATE MI ZIP CODE 48377  
 PHONE NO. 616-780-3277 FAX NO. 248-994-2241 P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS Alex.Villhauer QUOTE NO. \_\_\_\_\_

CONTACT NAME \_\_\_\_\_  SAME  
 COMPANY \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. \_\_\_\_\_ E-MAIL ADDRESS \_\_\_\_\_

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME 30075941.04100 / PACER Lansing SAMPLER(S) - PLEASE PRINT/SIGN NAME Austin Westhuis / AmLW  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other MI  
 Special Instructions

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

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives								OTHER	
	DATE	TIME				NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH				
29912.01	11/1/21	1350	SB-AS.3-PH182-67-72	GW	3	3								X	

1,4-Dioxane USEPA Method 8260 STM

RELINQUISHED BY: AmLW / Austin Westhuis Sampler DATE 11/1/21 TIME 1440  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

RELINQUISHED BY: Merit Drop Box DATE 11/1/21 TIME 1440  
 RECEIVED BY: M. Clifcoat DATE 11/1/21 TIME 1440  
 SEAL NO. \_\_\_\_\_ SEAL INTACT YES  NO  INITIALS \_\_\_\_\_ NOTES: TEMP. ON ARRIVAL 4.3  
 SEAL NO. \_\_\_\_\_ SEAL INTACT YES  NO  INITIALS \_\_\_\_\_



# Analytical Laboratory Report

Report ID: S29944.01(01)  
Generated on 11/02/2021

Report to

Attention: Alex Villhauer  
Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:  
Email: alex.vilhauer@arcadis.com

Additional Contacts: Patrick Curry, Austin Westhuis

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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S29944.01  
Project: 30075941.04100 / RACER Lansing  
Collected Date(s): 11/02/2021  
Submitted Date/Time: 11/02/2021 10:44  
Sampled by: Austin Westhuis  
P.O. #: 30075941.04100

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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)

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.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## 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
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
S29944.01	SB-A5.6-OO211_72-77	Groundwater	11/02/21 09:55



# Analytical Laboratory Report

Lab Sample ID: S29944.01

Sample Tag: SB-A5.6-OO211\_72-77

Collected Date/Time: 11/02/2021 09:55

Matrix: Groundwater

COC Reference: 124878

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/02/21 14:00	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/02/21 13:31, Analyst: KAG

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:S29944

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04100 / RACER Lansing

Submitted: 11/02/2021 10:44 Login User: MMC

Attention: Alex Villhauer

Address: Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:

Email: alex.villhauer@arcadis.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 5.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: \_\_\_\_\_



**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME: Alex Villhauer  
 COMPANY: Arcadis of Michigan, LLC  
 ADDRESS: 28550 Cabot Drive, Suite 500  
 CITY: Novi STATE: MI ZIP CODE: 48377  
 PHONE NO.: 616-780-3277 FAX NO.: 248-994-2241 P.O. NO.:  
 E-MAIL ADDRESS: Alex.Vilhauer@arcadis.com QUOTE NO.:

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

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME: 30075941.04100/RACER Lansing SAMPLER(S) - PLEASE PRINT/SIGN NAME: Austin Westhuis / *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

# Containers & Preservatives

MERIT LAB NO. FOR LAB USE ONLY	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	Certifications
	DATE	TIME											
	<del>11/2/21</del>		<del>SB-A5.6-00211-67-72</del>	<del>GW</del>	<del>3</del>		<del>3</del>						<input type="checkbox"/> OHIO VAP <input type="checkbox"/> Drinking Water <input type="checkbox"/> DoD <input type="checkbox"/> NPDES Project Locations <input type="checkbox"/> Detroit <input type="checkbox"/> New York <input checked="" type="checkbox"/> Other <u>MI</u> Special Instructions
29944.01	11/2/21	0955	SB-A5.6-00211-72-77	GW	3		3						*24-Hour TAT*

1,4-dioxane USEPA Method 82100 SEM

RELINQUISHED BY: *Austin Westhuis* / Arcadis DATE: 11/2/21 TIME: 1044  
 RECEIVED BY: *M. Curran* DATE: TIME:  
 RELINQUISHED BY: DATE: TIME:  
 RECEIVED BY: DATE: TIME:

RELINQUISHED BY: Merit Drop Box DATE: 11/2/21 TIME: 1044  
 RECEIVED BY: *M. Curran* DATE: 11/2/21 TIME: 1044  
 SEAL NO. SEAL INTACT YES  NO  INITIALS  
 SEAL NO. SEAL INTACT YES  NO  INITIALS  
 NOTES: TEMP. ON ARRIVAL: 5.0



# Analytical Laboratory Report

Report ID: S29956.01(01)  
Generated on 11/03/2021

## Report to

---

Attention: Alex Villhauer  
Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:  
Email: alex.vilhauer@arcadis.com

Additional Contacts: Patrick Curry, Austin Westhuis

## 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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S29956.01  
Project: 30075941.04100 / RACER Lansing  
Collected Date(s): 11/02/2021  
Submitted Date/Time: 11/02/2021 15:40  
Sampled by: Unknown  
P.O. #: 30075941.04100

## 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)

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.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## 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
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
S29956.01	SB-P2-JO68_71.5-76.5	Groundwater	11/02/21 15:10



# Analytical Laboratory Report

Lab Sample ID: S29956.01

Sample Tag: SB-P2-JO68\_71.5-76.5

Collected Date/Time: 11/02/2021 15:10

Matrix: Groundwater

COC Reference: 141670

### 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	11/03/21 10:20	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/03/21 13:21, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	104	1		ug/L	1	123-91-1	

# Merit Laboratories Login Checklist

Lab Set ID:S29956

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04100 / RACER Lansing

Submitted: 11/02/2021 15:40 Login User: MMC

Attention: Alex Villhauer

Address: Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:

Email: alex.villhauer@arcadis.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 3.0 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |
| 11. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    |

## Bottle Conditions

- |     |  |   |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: \_\_\_\_\_



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

C.O.C. PAGE #

OF

141670

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Alex Villhauer  
 COMPANY Arcadis of Michigan, LLC  
 ADDRESS 28550 Cabot Drive, Suite 500  
 CITY Novi STATE MI ZIP CODE 48377  
 PHONE NO. 616-780-3277 FAX NO. 248-994-2241 P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS Alex.Villhauer@arcadis.com QUOTE NO. \_\_\_\_\_

CONTACT NAME SAME  
 COMPANY \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. \_\_\_\_\_ E-MAIL ADDRESS \_\_\_\_\_

PROJECT NO./NAME 30075941.04100/RACER Lansing 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 GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 CODE: SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

# Containers & Preservatives

1/4-Dioxane USEPA Method 8260 SEM

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other MI  
 Special Instructions

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER								
	DATE	TIME																		
29956.01	11/2/21	1510	SB-P2-J068-71.5-76.5	GW	3		3						X							

RELINQUISHED BY: Austin Westhuis/Arcadis <sup>Sampler</sup> DATE 11/2/21 TIME 1540  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

RELINQUISHED BY: Merit Snap Box DATE 11/2/21 TIME 1540  
 RECEIVED BY: M. Chilcote DATE 11/2/21 TIME 1540  
 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



# Analytical Laboratory Report

Report ID: S30036.01(01)  
Generated on 11/05/2021

## Report to

---

Attention: Alex Villhauer  
Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:  
Email: alex.vilhauer@arcadis.com

Additional Contacts: Patrick Curry, Austin Westhuis

## 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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S30036.01-S30036.02  
Project: 30075941.04100 / RACER Lansing  
Collected Date(s): 11/03/2021 - 11/04/2021  
Submitted Date/Time: 11/04/2021 09:20  
Sampled by: Austin Westhuis  
P.O. #: 30075941.04100

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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.

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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.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## 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
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs



# Analytical Laboratory Report

## Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S30036.01	SB-P2-KH75_67-72	Groundwater	11/03/21 15:55
S30036.02	SB-P2-KH75_74-79	Groundwater	11/04/21 08:25



# Analytical Laboratory Report

Lab Sample ID: S30036.01

Sample Tag: SB-P2-KH75\_67-72

Collected Date/Time: 11/03/2021 15:55

Matrix: Groundwater

COC Reference: 141671

## 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	11/05/21 10:50	BML	

## Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/05/21 12:05, 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: S30036.02

Sample Tag: SB-P2-KH75\_74-79

Collected Date/Time: 11/04/2021 08:25

Matrix: Groundwater

COC Reference: 141671

## 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	11/05/21 10:50	BML	

## Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/05/21 12:25, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	12	1		ug/L	1	123-91-1	

# Merit Laboratories Login Checklist

Lab Set ID:S30036

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04100 / RACER Lansing

Submitted: 11/04/2021 09:20 Login User: MMC

Attention: Alex Villhauer

Address: Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:

Email: alex.villhauer@arcadis.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 2.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: \_\_\_\_\_





# Analytical Laboratory Report

Report ID: S30133.01(01)  
Generated on 11/08/2021

## Report to

---

Attention: Alex Villhauer  
Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:  
Email: alex.vilhauer@arcadis.com

Additional Contacts: Patrick Curry, Austin Westhuis

## 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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S30133.01  
Project: 30075941.04100 / RACER Lansing  
Collected Date(s): 11/05/2021  
Submitted Date/Time: 11/05/2021 13:50  
Sampled by: Austin Westhuis  
P.O. #: 30075941.04100

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Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

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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.

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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.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## 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
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b	Value detected less than reporting limit, but greater than MDL
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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
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
S30133.01	SB-P2-KH83_72-77	Groundwater	11/05/21 13:30



# Analytical Laboratory Report

Lab Sample ID: S30133.01

Sample Tag: SB-P2-KH83\_72-77

Collected Date/Time: 11/05/2021 13:30

Matrix: Groundwater

COC Reference: 141668

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	2.8	IR

## Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/05/21 17:45	bml	

## Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/05/21 20:14, Analyst: KAG

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:S30133

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04100 / RACER Lansing

Submitted: 11/05/2021 13:50 Login User: MMC

Attention: Alex Villhauer

Address: Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 616-780-3277 FAX:

Email: alex.villhauer@arcadis.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 2.8 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |
| 11. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    |

## Bottle Conditions

- |     |  |   |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: \_\_\_\_\_





# Analytical Laboratory Report

Report ID: S30821.01(01)+QC01  
Generated on 12/13/2021

Report to

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

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

Additional Contacts: Alex Villhauer, Marina Samp, Tiffany Linder

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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S30821.01-S30821.15  
Project: 30075941.04700 / RACER Lansing (Plant 6)  
Collected Date(s): 11/30/2021 - 12/01/2021  
Submitted Date/Time: 12/02/2021 08:15  
Sampled by: Billy Cobern  
P.O. #: 30075941.04700

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- QC Report (Pages 25-75)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

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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).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

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.

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Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

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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.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
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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
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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
E200.8	EPA Method 200.8 Revision 5.4
N/A	Not Applicable
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



# Analytical Laboratory Report

## Sample Summary (15 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S30821.01	MW-12-13_113021	Groundwater	11/30/21 12:05
S30821.02	MW-13-36R_113021	Groundwater	11/30/21 13:05
S30821.03	MW-20-132_113021	Groundwater	11/30/21 15:00
S30821.04	MW-20-131_113021	Groundwater	11/30/21 16:15
S30821.05	DUP-10_113021	Groundwater	11/30/21 00:01
S30821.06	MW-21-141_120121	Groundwater	12/01/21 09:40
S30821.07	DUP-12_120121	Groundwater	12/01/21 00:01
S30821.08	MW-03-06_120121	Groundwater	12/01/21 10:50
S30821.09	MW-03-05_120121	Groundwater	12/01/21 12:00
S30821.10	DUP-09_120121	Groundwater	12/01/21 00:01
S30821.11	MW-13-52_120121	Groundwater	12/01/21 13:20
S30821.12	MW-13-53_120121	Groundwater	12/01/21 15:40
S30821.13	MW-13-53_120121 MS	Groundwater	12/01/21 15:40
S30821.14	MW-13-53_120121 MSD	Groundwater	12/01/21 15:40
S30821.15	Trip Blank	Liquid	12/01/21 00:01



# Analytical Laboratory Report

Lab Sample ID: S30821.01

Sample Tag: MW-12-13\_113021

Collected Date/Time: 11/30/2021 12:05

Matrix: Groundwater

COC Reference: 137966

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	4.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	12/08/21 10:40	CCM	

### Metals

Method: E200.8, Run Date: 12/08/21 12:45, 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	



# Analytical Laboratory Report

Lab Sample ID: S30821.02

Sample Tag: MW-13-36R\_113021

Collected Date/Time: 11/30/2021 13:05

Matrix: Groundwater

COC Reference: 137966

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	4.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	12/08/21 10:40	CCM	

### Metals

Method: E200.8, Run Date: 12/08/21 12:47, 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	0.006	0.005		mg/L	5	7440-62-2	



# Analytical Laboratory Report

Lab Sample ID: S30821.03

Sample Tag: MW-20-132\_113021

Collected Date/Time: 11/30/2021 15:00

Matrix: Groundwater

COC Reference: 137966

### 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	12/03/21 08:15	NDK	

### Organics - Volatiles

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/02/21 18:07, Analyst: KAG**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	7	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



# Analytical Laboratory Report

Lab Sample ID: S30821.03 (continued)

Sample Tag: MW-20-132\_113021

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/02/21 18:07, Analyst: KAG (continued)**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	2	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



# Analytical Laboratory Report

Lab Sample ID: S30821.04

Sample Tag: MW-20-131\_113021

Collected Date/Time: 11/30/2021 16:15

Matrix: Groundwater

COC Reference: 137966

### 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	12/03/21 08:15	NDK	

### Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/02/21 18:26, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	3	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



# Analytical Laboratory Report

Lab Sample ID: S30821.04 (continued)

Sample Tag: MW-20-131\_113021

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/02/21 18:26, Analyst: KAG (continued)**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	2	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



# Analytical Laboratory Report

Lab Sample ID: S30821.05

Sample Tag: DUP-10\_113021

Collected Date/Time: 11/30/2021 00:01

Matrix: Groundwater

COC Reference: 137966

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	12/03/21 08:15	NDK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/02/21 18:46, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	7	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



# Analytical Laboratory Report

Lab Sample ID: S30821.05 (continued)

Sample Tag: DUP-10\_113021

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/02/21 18:46, Analyst: KAG (continued)**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	2	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



# Analytical Laboratory Report

Lab Sample ID: S30821.06

Sample Tag: MW-21-141\_120121

Collected Date/Time: 12/01/2021 09:40

Matrix: Groundwater

COC Reference: 137966

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/21 23:49, 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: S30821.07

Sample Tag: DUP-12\_120121

Collected Date/Time: 12/01/2021 00:01

Matrix: Groundwater

COC Reference: 137966

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 00:09, 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: S30821.08

Sample Tag: MW-03-06\_120121

Collected Date/Time: 12/01/2021 10:50

Matrix: Groundwater

COC Reference: 137966

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 00:29, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	5	1		ug/L	1	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S30821.09

Sample Tag: MW-03-05\_120121

Collected Date/Time: 12/01/2021 12:00

Matrix: Groundwater

COC Reference: 137966

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 00:49, 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: S30821.10

Sample Tag: DUP-09\_120121

Collected Date/Time: 12/01/2021 00:01

Matrix: Groundwater

COC Reference: 137966

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 01:10, 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: S30821.11

Sample Tag: MW-13-52\_120121

Collected Date/Time: 12/01/2021 13:20

Matrix: Groundwater

COC Reference: 137966

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 01:30, 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: S30821.12

Sample Tag: MW-13-53\_120121

Collected Date/Time: 12/01/2021 15:40

Matrix: Groundwater

COC Reference: 137966

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/21 16:52, 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: S30821.13

Sample Tag: MW-13-53\_120121 MS

Collected Date/Time: 12/01/2021 15:40

Matrix: Groundwater

COC Reference: 137966

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/21 12:49, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	61	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L



# Analytical Laboratory Report

Lab Sample ID: S30821.14

Sample Tag: MW-13-53\_120121 MSD

Collected Date/Time: 12/01/2021 15:40

Matrix: Groundwater

COC Reference: 137966

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/21 13:10, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	56	1		ug/L	1	123-91-1	1

1-Spiked at 50ug/L



# Analytical Laboratory Report

Lab Sample ID: S30821.15

Sample Tag: Trip Blank

Collected Date/Time: 12/01/2021 00:01

Matrix: Liquid

COC Reference: 137966

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	4.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/03/21 08:15	NDK	

### Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/02/21 15:35, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



# Analytical Laboratory Report

Lab Sample ID: S30821.15 (continued)

Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/02/21 15:35, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



# Quality Control Report

Report ID: S30821.01(01)+QC01  
Generated on 12/13/2021

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

Report Produced by  
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East Lansing, MI 48823  
  
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Phone: O:248-809-4013 C:947-777-5215 FAX:

## Report Summary

Lab Sample ID(s): S30821.01-S30821.15  
Project: 30075941.04700 / RACER Lansing (Plant 6)  
Submitted Date/Time: 12/02/2021 08:15  
Sampled by: Billy Cobern  
P.O. #: 30075941.04700

## QC Report Sections

- Cover Page (Page 25)
- Analysis Summary (Pages 26-40)
- Prep Batch Summary (Page 41)
- Surrogates per Lab Sample (Pages 42-45)
- Surrogates per QC Sample (Pages 46-49)
- Internal Standards per Lab Sample (Pages 50-60)
- Internal Standards per QC Sample (Pages 61-65)
- Batch QC Results (Pages 66-75)

## 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: S30821.01

Sample Tag: MW-12-13\_113021

Collected Date/Time: 11/30/2021 12:05

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Metals</b>						
Arsenic	E200.8	12/08/21 12:45	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD
Chromium	E200.8	12/08/21 12:45	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD
Copper	E200.8	12/08/21 12:45	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD
Lead	E200.8	12/08/21 12:45	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD
Nickel	E200.8	12/08/21 12:45	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD
Vanadium	E200.8	12/08/21 12:45	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD

# QC Report - Analysis Summary

Lab Sample ID: S30821.02

Sample Tag: MW-13-36R\_113021

Collected Date/Time: 11/30/2021 13:05

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Metals</b>						
Arsenic	E200.8	12/08/21 12:47	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD
Chromium	E200.8	12/08/21 12:47	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD
Copper	E200.8	12/08/21 12:47	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD
Lead	E200.8	12/08/21 12:47	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD
Nickel	E200.8	12/08/21 12:47	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD
Vanadium	E200.8	12/08/21 12:47	MT4-21-1208A	MTD-120821-2	No	BLK/LCS/MS/MSD

# QC Report - Analysis Summary

**Lab Sample ID: S30821.03**

Sample Tag: MW-20-132\_113021

Collected Date/Time: 11/30/2021 15:00

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
Volatile Organics - DEQ List	SW5030C/8260C	12/02/21 18:07	211202A9	VF211202W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

**Lab Sample ID: S30821.04**

Sample Tag: MW-20-131\_113021

Collected Date/Time: 11/30/2021 16:15

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
Volatile Organics - DEQ List	SW5030C/8260C	12/02/21 18:26	211202A9	VF211202W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

**Lab Sample ID: S30821.05**

Sample Tag: DUP-10\_113021

Collected Date/Time: 11/30/2021 00:01

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
Volatile Organics - DEQ List	SW5030C/8260C	12/02/21 18:46	211202A9	VF211202W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30821.06

Sample Tag: MW-21-141\_120121

Collected Date/Time: 12/01/2021 09:40

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/10/21 23:49	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30821.07

Sample Tag: DUP-12\_120121

Collected Date/Time: 12/01/2021 00:01

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 00:09	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30821.08

Sample Tag: MW-03-06\_120121

Collected Date/Time: 12/01/2021 10:50

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 00:29	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30821.09

Sample Tag: MW-03-05\_120121

Collected Date/Time: 12/01/2021 12:00

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 00:49	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30821.10

Sample Tag: DUP-09\_120121

Collected Date/Time: 12/01/2021 00:01

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 01:10	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30821.11

Sample Tag: MW-13-52\_120121

Collected Date/Time: 12/01/2021 13:20

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 01:30	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30821.12

Sample Tag: MW-13-53\_120121

Collected Date/Time: 12/01/2021 15:40

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/10/21 16:52	211210A9	VS211210W1	Yes	BLK/LCS/LCSD/MS/MS

# QC Report - Analysis Summary

Lab Sample ID: S30821.13

Sample Tag: MW-13-53\_120121 MS

Collected Date/Time: 12/01/2021 15:40

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/10/21 12:49	211210A9	VS211210W1	Yes	BLK/LCS/LCSD/MS/MS

# QC Report - Analysis Summary

**Lab Sample ID: S30821.14**

Sample Tag: MW-13-53\_120121 MSD

Collected Date/Time: 12/01/2021 15:40

Matrix: Groundwater

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/10/21 13:10	211210A9	VS211210W1	Yes	BLK/LCS/LCSD/MS/MS

# QC Report - Analysis Summary

**Lab Sample ID: S30821.15**

Sample Tag: Trip Blank

Collected Date/Time: 12/01/2021 00:01

Matrix: Liquid

COC Reference: 137966

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
Volatile Organics - DEQ List	SW5030C/8260C	12/02/21 15:35	211202A9	VF211202W2	Yes	BLK/LCS/LCSD

## QC Report - Prep Batch Summary

### Metals, Prep Batch ID: MTD-120821-2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S30821.01	Arsenic	E200.8	12/08/21 12:45	MT4-21-1208A
S30821.01	Chromium	E200.8	12/08/21 12:45	MT4-21-1208A
S30821.01	Copper	E200.8	12/08/21 12:45	MT4-21-1208A
S30821.01	Lead	E200.8	12/08/21 12:45	MT4-21-1208A
S30821.01	Nickel	E200.8	12/08/21 12:45	MT4-21-1208A
S30821.01	Vanadium	E200.8	12/08/21 12:45	MT4-21-1208A
S30821.02	Arsenic	E200.8	12/08/21 12:47	MT4-21-1208A
S30821.02	Chromium	E200.8	12/08/21 12:47	MT4-21-1208A
S30821.02	Copper	E200.8	12/08/21 12:47	MT4-21-1208A
S30821.02	Lead	E200.8	12/08/21 12:47	MT4-21-1208A
S30821.02	Nickel	E200.8	12/08/21 12:47	MT4-21-1208A
S30821.02	Vanadium	E200.8	12/08/21 12:47	MT4-21-1208A

### Organics - Volatiles, Prep Batch ID: VF211202W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S30821.03	Volatile Organics - DEQ List	SW5030C/8260C	12/02/21 18:07	211202A9
S30821.04	Volatile Organics - DEQ List	SW5030C/8260C	12/02/21 18:26	211202A9
S30821.05	Volatile Organics - DEQ List	SW5030C/8260C	12/02/21 18:46	211202A9
S30821.15	Volatile Organics - DEQ List	SW5030C/8260C	12/02/21 15:35	211202A9

### Organics - Volatiles, Prep Batch ID: VS211210W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S30821.12	1,4-Dioxane	SW8260B - SIM	12/10/21 16:52	211210A9
S30821.13	1,4-Dioxane	SW8260B - SIM	12/10/21 12:49	211210A9
S30821.14	1,4-Dioxane	SW8260B - SIM	12/10/21 13:10	211210A9

### Organics - Volatiles, Prep Batch ID: VS211210W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S30821.06	1,4-Dioxane	SW8260B - SIM	12/10/21 23:49	211210B9
S30821.07	1,4-Dioxane	SW8260B - SIM	12/11/21 00:09	211210B9
S30821.08	1,4-Dioxane	SW8260B - SIM	12/11/21 00:29	211210B9
S30821.09	1,4-Dioxane	SW8260B - SIM	12/11/21 00:49	211210B9
S30821.10	1,4-Dioxane	SW8260B - SIM	12/11/21 01:10	211210B9
S30821.11	1,4-Dioxane	SW8260B - SIM	12/11/21 01:30	211210B9

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30821.03

Sample Tag: MW-20-132\_113021

Collected Date/Time: 11/30/2021 15:00

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211202A9, Run Date: 12/02/2021 18:07, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		91.8	80.0	124.0
1,2-Dichloroethane-D4		107.2	72.0	125.0
Toluene-D8		99.8	89.0	112.0

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30821.04

Sample Tag: MW-20-131\_113021

Collected Date/Time: 11/30/2021 16:15

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211202A9, Run Date: 12/02/2021 18:26, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		101.3	80.0	124.0
1,2-Dichloroethane-D4		111.2	72.0	125.0
Toluene-D8		100.0	89.0	112.0

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30821.05

Sample Tag: DUP-10\_113021

Collected Date/Time: 11/30/2021 00:01

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211202A9, Run Date: 12/02/2021 18:46, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		93.2	80.0	124.0
1,2-Dichloroethane-D4		109.7	72.0	125.0
Toluene-D8		100.5	89.0	112.0

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30821.15

Sample Tag: Trip Blank

Collected Date/Time: 12/01/2021 00:01

Matrix: Liquid

COC Reference: 137966

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211202A9, Run Date: 12/02/2021 15:35, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		91.7	80.0	124.0
1,2-Dichloroethane-D4		100.3	72.0	125.0
Toluene-D8		99.6	89.0	112.0

**QC Report - Surrogates per QC Sample**

**Organics - Volatiles, Prep Batch ID: VF211202W2**

QC Types: BLK/LCS/LCSD

**Blank (BLK)**

Lab Sample ID: 211202A9.BLKW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 13:47, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		<b>92.7</b>	80.0	124.0
1,2-Dichloroethane-D4		<b>105.7</b>	72.0	125.0
Toluene-D8		<b>100.2</b>	89.0	112.0

**Blank (BLK)**

Lab Sample ID: 211202B9.BLKW02A

Run in Batch: 211202B9, Run Date: 12/02/2021 13:47, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
Toluene-D8		<b>99.1</b>	86.0	118.0

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211202A9.LCSW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 12:31, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		<b>95.3</b>	80.0	124.0
1,2-Dichloroethane-D4		<b>103.7</b>	72.0	125.0
Toluene-D8		<b>100.4</b>	89.0	112.0

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211202B9.LCSG02A

Run in Batch: 211202B9, Run Date: 12/02/2021 13:09, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
Toluene-D8		<b>98.6</b>	86.0	118.0

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211202A9.LCSDW02A, Parent Sample ID: 211202A9.LCSW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 12:50, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		<b>96.0</b>	80.0	124.0
1,2-Dichloroethane-D4		<b>103.4</b>	72.0	125.0
Toluene-D8		<b>100.5</b>	89.0	112.0

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211202B9.LCSDG02A, Parent Sample ID: 211202B9.LCSG02A

Run in Batch: 211202B9, Run Date: 12/02/2021 13:28, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
Toluene-D8		<b>99.9</b>	86.0	118.0

# QC Report - Surrogates per QC Sample

## Organics - Volatiles, Prep Batch ID: VS211210W1

QC Types: BLK/LCS/LCSD/MS/MSD

### Blank (BLK)

Lab Sample ID: 211210A9.BLKW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 16:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Laboratory Control Sample (LCS)

Lab Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:08, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211210A9.LCSDW10A, Parent Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Matrix Spike (MS)

Lab Sample ID: 211210A9.3082113M, Parent Sample ID: S30821.12

Run in Batch: 211210A9, Run Date: 12/10/2021 12:49, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Matrix Spike (MS)

Lab Sample ID: 211210A9.3082404R, Parent Sample ID: S30824.03

Run in Batch: 211210A9, Run Date: 12/10/2021 15:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Matrix Spike (MS)

Lab Sample ID: 211210A9.3102906M, Parent Sample ID: S31029.05

Run in Batch: 211210A9, Run Date: 12/10/2021 14:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Matrix Spike (MS)

Lab Sample ID: 211210A9.3103104M, Parent Sample ID: S31031.03

Run in Batch: 211210A9, Run Date: 12/10/2021 14:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

# QC Report - Surrogates per QC Sample

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3082114N, Parent Sample ID: 211210A9.3082113M

Run in Batch: 211210A9, Run Date: 12/10/2021 13:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3082405R, Parent Sample ID: 211210A9.3082404R

Run in Batch: 211210A9, Run Date: 12/10/2021 15:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3102907N, Parent Sample ID: 211210A9.3102906M

Run in Batch: 211210A9, Run Date: 12/10/2021 14:30, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3103105N, Parent Sample ID: 211210A9.3103104M

Run in Batch: 211210A9, Run Date: 12/10/2021 15:11, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

# QC Report - Surrogates per QC Sample

## Organics - Volatiles, Prep Batch ID: VS211210W2

QC Types: BLK/LCS/LCSD

### Blank (BLK)

Lab Sample ID: 211210B9.BLKW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 23:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

### Laboratory Control Sample (LCS)

Lab Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:28, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211210B9.LCSDW10B, Parent Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:48, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30821.03

Sample Tag: MW-20-132\_113021

Collected Date/Time: 11/30/2021 15:00

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211202A9, Run Date: 12/02/2021 18:07, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>99.8</b>	50.0	200.0
1,4-Difluorobenzene		<b>102.6</b>	50.0	200.0
Chlorobenzene-D5		<b>104.9</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>103.9</b>	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30821.04

Sample Tag: MW-20-131\_113021

Collected Date/Time: 11/30/2021 16:15

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211202A9, Run Date: 12/02/2021 18:26, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		100.2	50.0	200.0
1,4-Difluorobenzene		102.9	50.0	200.0
Chlorobenzene-D5		105.5	50.0	200.0
1,4-Dichlorobenzene-D4		106.5	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30821.05

Sample Tag: DUP-10\_113021

Collected Date/Time: 11/30/2021 00:01

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211202A9, Run Date: 12/02/2021 18:46, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		103.0	50.0	200.0
1,4-Difluorobenzene		103.7	50.0	200.0
Chlorobenzene-D5		107.7	50.0	200.0
1,4-Dichlorobenzene-D4		108.9	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30821.06

Sample Tag: MW-21-141\_120121

Collected Date/Time: 12/01/2021 09:40

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/10/2021 23:49, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		96.9	50.0	200.0
1,4-Dioxane-D8		98.6	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		80.8	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30821.07

Sample Tag: DUP-12\_120121

Collected Date/Time: 12/01/2021 00:01

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 00:09, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		96.5	50.0	200.0
1,4-Dioxane-D8		94.4	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		82.5	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30821.08

Sample Tag: MW-03-06\_120121

Collected Date/Time: 12/01/2021 10:50

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 00:29, 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		99.0	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		84.5	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30821.09

Sample Tag: MW-03-05\_120121

Collected Date/Time: 12/01/2021 12:00

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 00:49, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		97.8	50.0	200.0
1,4-Dioxane-D8		97.2	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		90.0	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30821.10

Sample Tag: DUP-09\_120121

Collected Date/Time: 12/01/2021 00:01

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 01:10, 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		99.4	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		94.6	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30821.11

Sample Tag: MW-13-52\_120121

Collected Date/Time: 12/01/2021 13:20

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 01:30, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		98.7	50.0	200.0
1,4-Dioxane-D8		96.8	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		82.0	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30821.12

Sample Tag: MW-13-53\_120121

Collected Date/Time: 12/01/2021 15:40

Matrix: Groundwater

COC Reference: 137966

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210A9, Run Date: 12/10/2021 16:52, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		91.2	50.0	200.0
1,4-Dioxane-D8		110.2	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		73.1	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30821.15

Sample Tag: Trip Blank

Collected Date/Time: 12/01/2021 00:01

Matrix: Liquid

COC Reference: 137966

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211202A9, Run Date: 12/02/2021 15:35, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		96.6	50.0	200.0
1,4-Difluorobenzene		96.6	50.0	200.0
Chlorobenzene-D5		96.3	50.0	200.0
1,4-Dichlorobenzene-D4		94.6	50.0	200.0

**QC Report - Internal Standards per QC Sample**

**Organics - Volatiles, Prep Batch ID: VF211202W2**

QC Types: BLK/LCS/LCSD

**Blank (BLK)**

Lab Sample ID: 211202A9.BLKW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 13:47, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>97.0</b>	50.0	200.0
1,4-Difluorobenzene		<b>98.8</b>	50.0	200.0
Chlorobenzene-D5		<b>99.9</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>100.4</b>	50.0	200.0

**Blank (BLK)**

Lab Sample ID: 211202B9.BLKW02A

Run in Batch: 211202B9, Run Date: 12/02/2021 13:47, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Difluorobenzene		<b>101.0</b>	50.0	200.0
Chlorobenzene-D5		<b>101.3</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>98.9</b>	50.0	200.0

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211202A9.LCSW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 12:31, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>100.4</b>	50.0	200.0
1,4-Difluorobenzene		<b>100.1</b>	50.0	200.0
Chlorobenzene-D5		<b>100.2</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>101.3</b>	50.0	200.0

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211202B9.LCSG02A

Run in Batch: 211202B9, Run Date: 12/02/2021 13:09, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Difluorobenzene		<b>101.4</b>	50.0	200.0
Chlorobenzene-D5		<b>106.0</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>110.2</b>	50.0	200.0

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211202A9.LCSDW02A, Parent Sample ID: 211202A9.LCSW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 12:50, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>97.1</b>	50.0	200.0
1,4-Difluorobenzene		<b>96.1</b>	50.0	200.0
Chlorobenzene-D5		<b>96.1</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>97.1</b>	50.0	200.0

# QC Report - Internal Standards per QC Sample

## Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211202B9.LCSDG02A, Parent Sample ID: 211202B9.LCSG02A

Run in Batch: 211202B9, Run Date: 12/02/2021 13:28, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Difluorobenzene		<b>99.6</b>	50.0	200.0
Chlorobenzene-D5		<b>99.9</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>95.8</b>	50.0	200.0

**QC Report - Internal Standards per QC Sample**

**Organics - Volatiles, Prep Batch ID: VS211210W1**

QC Types: BLK/LCS/LCSD/MS/MSD

**Blank (BLK)**

Lab Sample ID: 211210A9.BLKW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 16:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>85.3</b>	50.0	200.0
1,4-Dioxane-D8		<b>95.9</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>69.9</b>	50.0	200.0

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:08, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>104.5</b>	50.0	200.0
1,4-Dioxane-D8		<b>126.3</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>92.4</b>	50.0	200.0

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211210A9.LCSDW10A, Parent Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>109.7</b>	50.0	200.0
1,4-Dioxane-D8		<b>125.3</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>108.6</b>	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3082113M, Parent Sample ID: S30821.12

Run in Batch: 211210A9, Run Date: 12/10/2021 12:49, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>97.2</b>	50.0	200.0
1,4-Dioxane-D8		<b>102.9</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>92.7</b>	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3082404R, Parent Sample ID: S30824.03

Run in Batch: 211210A9, Run Date: 12/10/2021 15:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>93.1</b>	50.0	200.0
1,4-Dioxane-D8		<b>109.8</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>74.1</b>	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3102906M, Parent Sample ID: S31029.05

Run in Batch: 211210A9, Run Date: 12/10/2021 14:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		92.2	50.0	200.0
1,4-Dioxane-D8		99.8	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		78.0	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3103104M, Parent Sample ID: S31031.03

Run in Batch: 211210A9, Run Date: 12/10/2021 14:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		93.1	50.0	200.0
1,4-Dioxane-D8		101.7	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		76.3	50.0	200.0

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211210A9.3082114N, Parent Sample ID: 211210A9.3082113M

Run in Batch: 211210A9, Run Date: 12/10/2021 13:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		92.6	50.0	200.0
1,4-Dioxane-D8		100.3	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		77.9	50.0	200.0

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211210A9.3082405R, Parent Sample ID: 211210A9.3082404R

Run in Batch: 211210A9, Run Date: 12/10/2021 15:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		92.1	50.0	200.0
1,4-Dioxane-D8		103.9	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		74.1	50.0	200.0

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211210A9.3102907N, Parent Sample ID: 211210A9.3102906M

Run in Batch: 211210A9, Run Date: 12/10/2021 14:30, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		91.3	50.0	200.0
1,4-Dioxane-D8		103.1	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		75.0	50.0	200.0

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211210A9.3103105N, Parent Sample ID: 211210A9.3103104M

Run in Batch: 211210A9, Run Date: 12/10/2021 15:11, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		84.7	50.0	200.0
1,4-Dioxane-D8		102.2	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		72.1	50.0	200.0

# QC Report - Internal Standards per QC Sample

## Organics - Volatiles, Prep Batch ID: VS211210W2

QC Types: BLK/LCS/LCSD

### Blank (BLK)

Lab Sample ID: 211210B9.BLKW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 23:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		87.9	50.0	200.0
1,4-Dioxane-D8		83.1	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		95.2	50.0	200.0

### Laboratory Control Sample (LCS)

Lab Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:28, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		91.0	50.0	200.0
1,4-Dioxane-D8		97.4	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		86.5	50.0	200.0

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211210B9.LCSDW10B, Parent Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:48, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		96.2	50.0	200.0
1,4-Dioxane-D8		107.7	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		88.9	50.0	200.0

## QC Report - Batch QC Results

**Metals, Prep Batch ID: MTD-120821-2**

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

**Blank (BLK)**

Lab Sample ID: MT4-21-1208A.022.LRB

Run in Batch: MT4-21-1208A, Run Date: 12/08/2021 12:38, Prep Date: 12/08/2021, 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: MT4-21-1208A.020.LCS

Run in Batch: MT4-21-1208A, Run Date: 12/08/2021 12:34, Prep Date: 12/08/2021, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Arsenic		100	85	115
Chromium		105	85	115
Copper		101	85	115
Lead		96	85	115
Nickel		104	85	115
Vanadium		105	85	115

**Matrix Spike (MS)**

Lab Sample ID: MT4-21-1208A.035.MS, Parent Sample ID: S30875.04

Run in Batch: MT4-21-1208A, Run Date: 12/08/2021 13:07, Prep Date: 12/08/2021, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Arsenic		102	75	125
Chromium		106	75	125
Copper		103	75	125
Lead		96	75	125
Nickel		104	75	125
Vanadium		108	75	125

**Matrix Spike (MS)**

Lab Sample ID: MT4-21-1208A.050.MS, Parent Sample ID: S30880.04

Run in Batch: MT4-21-1208A, Run Date: 12/08/2021 13:35, Prep Date: 12/08/2021, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL
Arsenic		104	75	125
Chromium		104	75	125
Copper		90	75	125
Lead		87	75	125
Nickel		95	75	125
Vanadium		110	75	125

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: MT4-21-1208A.036.MSD, Parent Sample ID: MT4-21-1208A.035.MS

Run in Batch: MT4-21-1208A, Run Date: 12/08/2021 13:08, Prep Date: 12/08/2021, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Arsenic		100	75	125	1	20
Chromium		102	75	125	5	20

# QC Report - Batch QC Results

## Metals, Prep Batch ID: MTD-120821-2 (continued)

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

## Matrix Spike Duplicate (MSD) (continued)

Lab Sample ID: MT4-21-1208A.036.MSD, Parent Sample ID: MT4-21-1208A.035.MS

Run in Batch: MT4-21-1208A, Run Date: 12/08/2021 13:08, Prep Date: 12/08/2021, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Copper		101	75	125	1	20
Lead		97	75	125	1	20
Nickel		104	75	125	0	20
Vanadium		104	75	125	4	20

## Matrix Spike Duplicate (MSD)

Lab Sample ID: MT4-21-1208A.051.MSD, Parent Sample ID: MT4-21-1208A.050.MS

Run in Batch: MT4-21-1208A, Run Date: 12/08/2021 13:36, Prep Date: 12/08/2021, Matrix: Liquid, Dilution: 5

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Arsenic		102	75	125	2	20
Chromium		98	75	125	2	20
Copper		87	75	125	3	20
Lead		87	75	125	0	20
Nickel		91	75	125	4	20
Vanadium		108	75	125	1	20

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF211202W2

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

Blank (BLK)

Lab Sample ID: 211202A9.BLKW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 13:47, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acetone		ND	10.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Benzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Bromoform		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Chloroform		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Diethyl ether		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
2-Hexanone		ND	10.00	ug/l
Hexachloroethane		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Methyl iodide		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211202W2 (continued)**

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

**Blank (BLK) (continued)**

Lab Sample ID: 211202A9.BLKW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 13:47, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Naphthalene		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Toluene		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211202A9.LCSW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 12:31, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acetone		104.5	29.9	161.5
Acrylonitrile		108.6	69.9	128.9
2-Butanone (MEK)		103.8	44.0	134.4
Benzene		98.2	79.9	124.9
n-Butylbenzene		94.0	80.0	133.3
Bromobenzene		93.4	78.7	124.6
Bromochloromethane		101.6	78.2	120.8
Bromodichloromethane		100.1	80.4	128.2
Bromoform		95.4	69.4	128.0
Bromomethane		107.5	56.8	151.3
sec-Butylbenzene		96.9	77.4	129.8
tert-Butylbenzene		92.4	80.7	128.9
Carbon disulfide		92.8	63.8	137.4
Carbon tetrachloride		95.6	72.6	133.0
Chlorobenzene		96.6	79.2	122.7
Chloroethane		108.3	53.4	149.4
Chloroform		100.9	78.4	124.0
Chloromethane		108.2	23.8	166.5
1,1-Dichloroethane		100.4	71.5	126.2
1,1-Dichloroethene		96.1	69.6	139.4

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211202W2 (continued)**

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

**Laboratory Control Sample (LCS) (continued)**

Lab Sample ID: 211202A9.LCSW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 12:31, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,2-Dibromo-3-chloropropane		93.4	21.2	189.4
1,2-Dibromoethane		98.5	70.3	133.7
1,2-Dichlorobenzene		92.5	10.0	166.2
1,2-Dichloroethane		97.3	76.0	126.3
1,2-Dichloropropane		101.7	78.6	126.4
1,3-Dichlorobenzene		98.3	77.0	131.3
1,4-Dichlorobenzene		97.3	20.7	137.7
cis-1,2-Dichloroethene		98.6	76.6	122.1
cis-1,3-Dichloropropene		101.5	79.8	129.9
Dibromochloromethane		101.6	74.6	127.2
Dibromomethane		99.4	76.9	122.1
Dichlorodifluoromethane		87.2	10.0	222.8
Diethyl ether		120.6	67.4	121.2
trans-1,2-Dichloroethene		99.2	73.6	129.3
trans-1,3-Dichloropropene		100.0	74.0	131.3
trans-1,4-Dichloro-2-butene		128.5	68.6	135.4
Ethylbenzene		96.4	79.5	129.1
2-Hexanone		104.6	55.4	136.9
Hexachloroethane		91.7	23.8	138.1
p-Isopropyltoluene		99.7	79.8	137.5
Isopropylbenzene		92.9	74.4	121.5
2-Methylnaphthalene		87.8	25.5	165.5
4-Methyl-2-pentanone (MIBK)		102.4	71.6	125.2
tert-Methyl butyl ether (MTBE)		105.1	73.2	122.4
Methyl iodide		101.3	68.8	116.4
Methylene chloride		97.2	73.3	121.1
Naphthalene		84.4	32.9	135.8
n-Propylbenzene		92.4	82.0	130.7
Styrene		100.2	69.5	126.7
1,1,1,2-Tetrachloroethane		101.2	80.3	128.2
1,1,1-Trichloroethane		97.4	79.4	130.9
1,1,2,2-Tetrachloroethane		89.3	79.8	126.3
1,1,2-Trichloroethane		102.4	78.7	123.1
1,2,3-Trichlorobenzene		83.6	75.4	131.4
1,2,3-Trichloropropane		93.3	78.3	138.8
1,2,3-Trimethylbenzene		103.4	76.3	124.2
1,2,4-Trichlorobenzene		83.4	27.4	143.4
1,2,4-Trimethylbenzene		97.3	81.4	130.8
1,3,5-Trimethylbenzene		98.0	81.3	128.9
Tetrachloroethene		94.0	74.5	124.5
Tetrahydrofuran		102.0	59.0	117.9
Toluene		97.7	79.8	124.5
Trichloroethene		97.9	79.7	124.2
Trichlorofluoromethane		103.1	59.7	151.8
Vinyl chloride		104.5	43.5	149.1
o-Xylene		98.6	80.2	131.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211202W2 (continued)**

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

**Laboratory Control Sample (LCS) (continued)**

Lab Sample ID: 211202A9.LCSW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 12:31, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
p,m-Xylene		97.3	79.4	132.2

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211202A9.LCSDW02A, Parent Sample ID: 211202A9.LCSW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 12:50, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acetone		100.4	29.9	161.5	4.0	30.0
Acrylonitrile		103.6	69.9	128.9	4.7	30.0
2-Butanone (MEK)		102.8	44.0	134.4	0.9	30.0
Benzene		98.3	79.9	124.9	0.2	30.0
n-Butylbenzene		103.5	80.0	133.3	9.6	30.0
Bromobenzene		94.0	78.7	124.6	0.6	30.0
Bromochloromethane		99.9	78.2	120.8	1.7	30.0
Bromodichloromethane		100.1	80.4	128.2	0.0	30.0
Bromoform		108.6	69.4	128.0	13.0	30.0
Bromomethane		106.2	56.8	151.3	1.2	30.0
sec-Butylbenzene		95.1	77.4	129.8	1.9	30.0
tert-Butylbenzene		92.5	80.7	128.9	0.2	30.0
Carbon disulfide		90.1	63.8	137.4	2.9	30.0
Carbon tetrachloride		92.8	72.6	133.0	3.0	30.0
Chlorobenzene		96.7	79.2	122.7	0.1	30.0
Chloroethane		103.8	53.4	149.4	4.2	30.0
Chloroform		98.3	78.4	124.0	2.7	30.0
Chloromethane		107.1	23.8	166.5	1.0	30.0
1,1-Dichloroethane		98.3	71.5	126.2	2.1	30.0
1,1-Dichloroethene		91.8	69.6	139.4	4.6	30.0
1,2-Dibromo-3-chloropropane		108.1	21.2	189.4	14.6	30.0
1,2-Dibromoethane		101.5	70.3	133.7	2.9	30.0
1,2-Dichlorobenzene		95.4	10.0	166.2	3.1	30.0
1,2-Dichloroethane		98.3	76.0	126.3	1.0	30.0
1,2-Dichloropropane		102.8	78.6	126.4	1.0	30.0
1,3-Dichlorobenzene		101.2	77.0	131.3	2.9	30.0
1,4-Dichlorobenzene		97.8	20.7	137.7	0.5	30.0
cis-1,2-Dichloroethene		98.9	76.6	122.1	0.4	30.0
cis-1,3-Dichloropropene		101.3	79.8	129.9	0.1	30.0
Dibromochloromethane		100.7	74.6	127.2	0.8	30.0
Dibromomethane		100.0	76.9	122.1	0.6	30.0
Dichlorodifluoromethane		84.8	10.0	222.8	2.8	30.0
Diethyl ether	*	126.4	67.4	121.2	4.6	30.0
trans-1,2-Dichloroethene		97.2	73.6	129.3	2.0	30.0
trans-1,3-Dichloropropene		101.7	74.0	131.3	1.7	30.0
trans-1,4-Dichloro-2-butene		125.4	68.6	135.4	2.4	30.0
Ethylbenzene		106.1	79.5	129.1	9.6	30.0
2-Hexanone		104.6	55.4	136.9	0.0	30.0
Hexachloroethane		91.5	23.8	138.1	0.3	30.0
p-Isopropyltoluene		102.6	79.8	137.5	2.9	30.0

## QC Report - Batch QC Results

### Organics - Volatiles, Prep Batch ID: VF211202W2 (continued)

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

### Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 211202A9.LCSDW02A, Parent Sample ID: 211202A9.LCSW02A

Run in Batch: 211202A9, Run Date: 12/02/2021 12:50, Prep Date: 12/02/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isopropylbenzene		109.0	74.4	121.5	16.0	30.0
2-Methylnaphthalene		92.3	25.5	165.5	5.0	30.0
4-Methyl-2-pentanone (MIBK)		102.2	71.6	125.2	0.1	30.0
tert-Methyl butyl ether (MTBE)		104.3	73.2	122.4	0.8	30.0
Methyl iodide		98.1	68.8	116.4	3.2	30.0
Methylene chloride		94.5	73.3	121.1	2.8	30.0
Naphthalene		92.0	32.9	135.8	8.5	30.0
n-Propylbenzene		91.3	82.0	130.7	1.2	30.0
Styrene		96.9	69.5	126.7	3.4	30.0
1,1,1,2-Tetrachloroethane		102.0	80.3	128.2	0.9	30.0
1,1,1-Trichloroethane		95.0	79.4	130.9	2.5	30.0
1,1,2,2-Tetrachloroethane		91.6	79.8	126.3	2.6	30.0
1,1,2-Trichloroethane		99.9	78.7	123.1	2.4	30.0
1,2,3-Trichlorobenzene		85.9	75.4	131.4	2.6	30.0
1,2,3-Trichloropropane		91.7	78.3	138.8	1.8	30.0
1,2,3-Trimethylbenzene		100.4	76.3	124.2	3.0	30.0
1,2,4-Trichlorobenzene		103.0	27.4	143.4	21.1	30.0
1,2,4-Trimethylbenzene		94.0	81.4	130.8	3.4	30.0
1,3,5-Trimethylbenzene		94.3	81.3	128.9	3.8	30.0
Tetrachloroethene		94.1	74.5	124.5	0.1	30.0
Tetrahydrofuran		101.3	59.0	117.9	0.7	30.0
Toluene		96.4	79.8	124.5	1.3	30.0
Trichloroethene		97.1	79.7	124.2	0.8	30.0
Trichlorofluoromethane		97.7	59.7	151.8	5.3	30.0
Vinyl chloride		103.3	43.5	149.1	1.1	30.0
o-Xylene		94.5	80.2	131.0	4.3	30.0
p,m-Xylene		96.4	79.4	132.2	0.9	30.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VS211210W1**

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

**Blank (BLK)**

Lab Sample ID: 211210A9.BLKW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 16:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:08, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		97.0	70.0	130.0

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211210A9.LCSDW10A, Parent Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		101.1	70.0	130.0	4.1	30.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3082113M, Parent Sample ID: S30821.12

Run in Batch: 211210A9, Run Date: 12/10/2021 12:49, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		121.4	70.0	130.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3082404R, Parent Sample ID: S30824.03

Run in Batch: 211210A9, Run Date: 12/10/2021 15:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		106.0	70.0	130.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3102906M, Parent Sample ID: S31029.05

Run in Batch: 211210A9, Run Date: 12/10/2021 14:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		124.2	70.0	130.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3103104M, Parent Sample ID: S31031.03

Run in Batch: 211210A9, Run Date: 12/10/2021 14:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane	*	145.1	70.0	130.0

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211210A9.3082114N, Parent Sample ID: 211210A9.3082113M

Run in Batch: 211210A9, Run Date: 12/10/2021 13:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		110.4	70.0	130.0	9.3	30.0

# QC Report - Batch QC Results

## Organics - Volatiles, Prep Batch ID: VS211210W1 (continued)

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

### Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3082405R, Parent Sample ID: 211210A9.3082404R

Run in Batch: 211210A9, Run Date: 12/10/2021 15:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		100.7	70.0	130.0	3.2	30.0

### Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3102907N, Parent Sample ID: 211210A9.3102906M

Run in Batch: 211210A9, Run Date: 12/10/2021 14:30, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		106.6	70.0	130.0	14.8	30.0

### Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3103105N, Parent Sample ID: 211210A9.3103104M

Run in Batch: 211210A9, Run Date: 12/10/2021 15:11, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane	*	142.1	70.0	130.0	0.7	30.0

# QC Report - Batch QC Results

## Organics - Volatiles, Prep Batch ID: VS211210W2

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

### Blank (BLK)

Lab Sample ID: 211210B9.BLKW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 23:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

### Laboratory Control Sample (LCS)

Lab Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:28, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		100.6	70.0	130.0

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211210B9.LCSDW10B, Parent Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:48, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		98.0	70.0	130.0	2.6	30.0

# Merit Laboratories Login Checklist

Lab Set ID:S30821

Attention: Kaitlyn Hunt

Address: Arcadis  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04700 / RACER Lansing (Plant 6)

Submitted: 12/02/2021 08:15 Login User: JRM

Phone: O:248-809-4013 FAX:

Email: Kaitlyn.Hunt@arcadis.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.0 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    |

## Bottle Conditions

- |     |  |   |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: S30821      Submitted: 12/02/2021 08:15  
Client: ARCADIS\_NOVI (ARCADIS U.S., Inc.)  
Project: 30075941.04700 / RACER Lansing (Plant 6)  
Initial Preservation Check: 12/02/2021 08:50 JRM  
Preservation Recheck (E200.8): N/A

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

Phone: O:248-809-4013      FAX:  
Email: Kaitlyn.Hunt@arcadis.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S30821.01	125ml Plastic HNO3	<2			
S30821.02	125ml Plastic HNO3	<2			

Plant-6



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 137966

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME **KAITLYN HUNT**  
 COMPANY **ARCADIS**  
 ADDRESS **28550 CABOT DR. SUITE 500**  
 CITY **NOVI** STATE **MI** ZIP CODE **48377**  
 PHONE NO. **947-777-5215** FAX NO. \_\_\_\_\_ P.O. NO. **30075941-04700**  
 E-MAIL ADDRESS **KAITLYN.HUNT@ARCADIS.COM** QUOTE NO. \_\_\_\_\_

CONTACT NAME  SAME  
 COMPANY \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. \_\_\_\_\_ E-MAIL ADDRESS \_\_\_\_\_

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME **30075941-04700/RACER Lansing (Plant) Bury J Gibson JL** 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 \_\_\_\_\_

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other MI  
 Special Instructions

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

# Containers & Preservatives

MERIT LAB NO. FOR LAB USE ONLY	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	ANALYSIS	ANALYSIS	ANALYSIS	ANALYSIS	ANALYSIS	ANALYSIS	ANALYSIS	
	DATE	TIME																		
30821.01	11/30/21	12:05	MW-12-13-113021	GW	1			1												
.02	11/30/21	13:05	MW-13-36R-113021	GW	1			1												
.03	11/30/21	15:00	MW-20-132-113021	GW	3		3						3							
.04	11/30/21	16:15	MW-20-131-113021	GW	3		3						3							
.05	11/30/21	—	DUP-10-113021	GW	3		3						3							
.06	12/1/21	9:40	MW-21-141-120121	GW	3		3													3
.07	12/1/21	—	DUP-12-120121	GW	3		3													3
.08	12/1/21	10:50	MW-03-06-120121	GW	3		3													3
.09	12/1/21	12:00	MW-03-05-120121	GW	3		3													3
.10	12/1/21	—	DUP-09-120121	GW	3		3													3
.11	12/1/21	13:20	MW-13-52-120121	GW	3		3													3
.12/.13/.14	12/1/21	15:40	MW-13-53-120121	GW	9		9													9
.15	12/1/21	—	Tap Blank	GW	1															

SW-6030A  
 As, Ni, Pb, V, Cr, Cu  
 VOC-8260B Sims  
 1.4 OILXANG  
 8260B Sims

RELINQUISHED BY: *[Signature]* DATE **12-1-21** TIME **1720**  
 RECEIVED BY: *[Signature]* DATE **12-1-21** TIME **1720**  
 RELINQUISHED BY: *[Signature]* DATE **12/2/21** TIME **0815**  
 RECEIVED BY: *[Signature]* DATE **12/2/21** TIME **0815**

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 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



# Analytical Laboratory Report

Report ID: S30824.01(01)+QC01  
Generated on 12/15/2021

Report to

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

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

Additional Contacts: Alex Villhauer, Marina Samp, Tiffany Linder

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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S30824.01-S30824.15  
Project: 30075941.04700 / RACER Lansing (Plant 2)  
Collected Date(s): 12/01/2021  
Submitted Date/Time: 12/02/2021 08:15  
Sampled by: Donald Richmond  
P.O. #: 30075941.04700

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- QC Report (Pages 26-85)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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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).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

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.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## 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
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



# Analytical Laboratory Report

## Sample Summary (15 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S30824.01	MW-15-72_120121	Groundwater	12/01/21 10:10
S30824.02	MW-20-130_120121	Groundwater	12/01/21 12:05
S30824.03	MW-16-81_120121	Groundwater	12/01/21 13:25
S30824.04	MW-16-81_120121 MS	Groundwater	12/01/21 13:25
S30824.05	MW-16-81_120121 MSD	Groundwater	12/01/21 13:25
S30824.06	MW-14-56_120121	Groundwater	12/01/21 15:30
S30824.07	MW-12-09_120121	Groundwater	12/01/21 10:35
S30824.08	MW-14-58R_120121	Groundwater	12/01/21 13:05
S30824.09	DUP-04_120121	Groundwater	12/01/21 00:01
S30824.10	MW-14-59_120121	Groundwater	12/01/21 14:00
S30824.11	MW-14-60_120121	Groundwater	12/01/21 14:45
S30824.12	MW-14-62_120121	Groundwater	12/01/21 15:40
S30824.13	MW-21-139_120121	Groundwater	12/01/21 16:25
S30824.14	P2-MW-04_120121	Groundwater	12/01/21 15:45
S30824.15	Trip Blank	Liquid	12/01/21 00:01



# Analytical Laboratory Report

Lab Sample ID: S30824.01

Sample Tag: MW-15-72\_120121

Collected Date/Time: 12/01/2021 10:10

Matrix: Groundwater

COC Reference: 141450

### 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	12/07/21 10:40	NDK	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 01:50, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	133	1		ug/L	1	123-91-1	

### Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 16:42, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	



# Analytical Laboratory Report

Lab Sample ID: S30824.01 (continued)

Sample Tag: MW-15-72\_120121

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 16:42, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



# Analytical Laboratory Report

Lab Sample ID: S30824.02

Sample Tag: MW-20-130\_120121

Collected Date/Time: 12/01/2021 12:05

Matrix: Groundwater

COC Reference: 141450

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 02:11, 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: S30824.03

Sample Tag: MW-16-81\_120121

Collected Date/Time: 12/01/2021 13:25

Matrix: Groundwater

COC Reference: 141450

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	12/07/21 10:40	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/21 17:11, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	310	10		ug/L	10	123-91-1	Y

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 16:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Lab Sample ID: S30824.03 (continued)

Sample Tag: MW-16-81\_120121

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 16:04, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



# Analytical Laboratory Report

Lab Sample ID: S30824.04

Sample Tag: MW-16-81\_120121 MS

Collected Date/Time: 12/01/2021 13:25

Matrix: Groundwater

COC Reference: 141450

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	12/07/21 10:40	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/21 15:31, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	840	10		ug/L	10	123-91-1	Y1

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 13:12, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	51	50		ug/L	1	67-64-1	2
Acrylonitrile	53	2		ug/L	1	107-13-1	2
2-Butanone (MEK)	53	25		ug/L	1	78-93-3	2
Benzene	49	1		ug/L	1	71-43-2	2
n-Butylbenzene	47	1		ug/L	1	104-51-8	2
Bromobenzene	47	1		ug/L	1	108-86-1	2
Bromochloromethane	51	1		ug/L	1	74-97-5	2
Bromodichloromethane	50	1		ug/L	1	75-27-4	2
Bromoform	46	1		ug/L	1	75-25-2	2
Bromomethane	49	5		ug/L	1	74-83-9	2
sec-Butylbenzene	48	1		ug/L	1	135-98-8	2
tert-Butylbenzene	46	1		ug/L	1	98-06-6	2
Carbon disulfide	47	5		ug/L	1	75-15-0	2
Carbon tetrachloride	48	1		ug/L	1	56-23-5	2
Chlorobenzene	47	1		ug/L	1	108-90-7	2
Chloroethane	50	5		ug/L	1	75-00-3	2
Chloroform	51	1		ug/L	1	67-66-3	2
Chloromethane	50	5		ug/L	1	74-87-3	2
1,1-Dichloroethane	51	1		ug/L	1	75-34-3	2
1,1-Dichloroethene	49	1		ug/L	1	75-35-4	2
1,2-Dibromo-3-chloropropane	51	5		ug/L	1	96-12-8	2
1,2-Dibromoethane	48	1		ug/L	1	106-93-4	2
1,2-Dichlorobenzene	45	1		ug/L	1	95-50-1	2
1,2-Dichloroethane	49	1		ug/L	1	107-06-2	2
1,2-Dichloropropane	51	1		ug/L	1	78-87-5	2
1,3-Dichlorobenzene	49	1		ug/L	1	541-73-1	2
1,4-Dichlorobenzene	48	1		ug/L	1	106-46-7	2
cis-1,2-Dichloroethene	51	1		ug/L	1	156-59-2	2
cis-1,3-Dichloropropene	50	1		ug/L	1	10061-01-5	2
Dibromochloromethane	49	5		ug/L	1	124-48-1	2
Dibromomethane	50	5		ug/L	1	74-95-3	2

Y-Elevated reporting limit due to high target concentration 1-Spiked at 500ug/L  
 2-Spiked at 50ug/L



# Analytical Laboratory Report

Lab Sample ID: S30824.04 (continued)

Sample Tag: MW-16-81\_120121 MS

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 13:12, Analyst: KAG (continued)**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dichlorodifluoromethane	45	5		ug/L	1	75-71-8	1
Diethyl ether	52	10		ug/L	1	60-29-7	1
trans-1,2-Dichloroethene	50	1		ug/L	1	156-60-5	1
trans-1,3-Dichloropropene	50	1		ug/L	1	10061-02-6	1
trans-1,4-Dichloro-2-butene	60	1		ug/L	1	110-57-6	1
Ethylbenzene	48	1		ug/L	1	100-41-4	1
2-Hexanone	Not detected	50		ug/L	1	591-78-6	1
Hexachloroethane	46	5		ug/L	1	67-72-1	1
p-Isopropyltoluene	50	5		ug/L	1	99-87-6	1
Isopropylbenzene	46	5		ug/L	1	98-82-8	1
2-Methylnaphthalene	40	5		ug/L	1	91-57-6	1
4-Methyl-2-pentanone (MIBK)	51	50		ug/L	1	108-10-1	1
tert-Methyl butyl ether (MTBE)	54	5		ug/L	1	1634-04-4	1
Methyl iodide	51	1		ug/L	1	74-88-4	1
Methylene chloride	49	5		ug/L	1	75-09-2	1
Naphthalene	53	5		ug/L	1	91-20-3	1
n-Propylbenzene	46	1		ug/L	1	103-65-1	1
Styrene	47	1		ug/L	1	100-42-5	1
1,1,1,2-Tetrachloroethane	50	1		ug/L	1	630-20-6	1
1,1,1-Trichloroethane	50	1		ug/L	1	71-55-6	1
1,1,2,2-Tetrachloroethane	44	1		ug/L	1	79-34-5	1
1,1,2-Trichloroethane	50	1		ug/L	1	79-00-5	1
1,2,3-Trichlorobenzene	48	5		ug/L	1	87-61-6	1
1,2,3-Trichloropropane	45	1		ug/L	1	96-18-4	1
1,2,3-Trimethylbenzene	50	1		ug/L	1	526-73-8	1
1,2,4-Trichlorobenzene	54	5		ug/L	1	120-82-1	1
1,2,4-Trimethylbenzene	46	1		ug/L	1	95-63-6	1
1,3,5-Trimethylbenzene	47	1		ug/L	1	108-67-8	1
Tetrachloroethene	47	1		ug/L	1	127-18-4	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Toluene	49	1		ug/L	1	108-88-3	1
Trichloroethene	49	1		ug/L	1	79-01-6	1
Trichlorofluoromethane	50	1		ug/L	1	75-69-4	1
Vinyl chloride	48	1		ug/L	1	75-01-4	1
o-Xylene	47	1		ug/L	1	95-47-6	1
p,m-Xylene*	95	2		ug/L	1		1

1-Spiked at 50ug/L



# Analytical Laboratory Report

Lab Sample ID: S30824.05

Sample Tag: MW-16-81\_120121 MSD

Collected Date/Time: 12/01/2021 13:25

Matrix: Groundwater

COC Reference: 141450

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	12/07/21 10:40	NDK	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/10/21 15:51, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	810	10		ug/L	10	123-91-1	Y1

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 13:31, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	74	50		ug/L	1	67-64-1	2
Acrylonitrile	76	2		ug/L	1	107-13-1	2
2-Butanone (MEK)	69	25		ug/L	1	78-93-3	2
Benzene	50	1		ug/L	1	71-43-2	2
n-Butylbenzene	40	1		ug/L	1	104-51-8	2
Bromobenzene	44	1		ug/L	1	108-86-1	2
Bromochloromethane	59	1		ug/L	1	74-97-5	2
Bromodichloromethane	42	1		ug/L	1	75-27-4	2
Bromoform	45	1		ug/L	1	75-25-2	2
Bromomethane	43	5		ug/L	1	74-83-9	2
sec-Butylbenzene	47	1		ug/L	1	135-98-8	2
tert-Butylbenzene	49	1		ug/L	1	98-06-6	2
Carbon disulfide	59	5		ug/L	1	75-15-0	2
Carbon tetrachloride	46	1		ug/L	1	56-23-5	2
Chlorobenzene	46	1		ug/L	1	108-90-7	2
Chloroethane	46	5		ug/L	1	75-00-3	2
Chloroform	58	1		ug/L	1	67-66-3	2
Chloromethane	42	5		ug/L	1	74-87-3	2
1,1-Dichloroethane	66	1		ug/L	1	75-34-3	2
1,1-Dichloroethene	61	1		ug/L	1	75-35-4	2
1,2-Dibromo-3-chloropropane	42	5		ug/L	1	96-12-8	2
1,2-Dibromoethane	48	1		ug/L	1	106-93-4	2
1,2-Dichlorobenzene	39	1		ug/L	1	95-50-1	2
1,2-Dichloroethane	48	1		ug/L	1	107-06-2	2
1,2-Dichloropropane	43	1		ug/L	1	78-87-5	2
1,3-Dichlorobenzene	46	1		ug/L	1	541-73-1	2
1,4-Dichlorobenzene	49	1		ug/L	1	106-46-7	2
cis-1,2-Dichloroethene	62	1		ug/L	1	156-59-2	2
cis-1,3-Dichloropropene	43	1		ug/L	1	10061-01-5	2
Dibromochloromethane	47	5		ug/L	1	124-48-1	2
Dibromomethane	42	5		ug/L	1	74-95-3	2

Y-Elevated reporting limit due to high target concentration 1-Spiked at 500ug/L  
 2-Spiked at 50ug/L



# Analytical Laboratory Report

Lab Sample ID: S30824.05 (continued)

Sample Tag: MW-16-81\_120121 MSD

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 13:31, Analyst: KAG (continued)**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dichlorodifluoromethane	32	5		ug/L	1	75-71-8	1
Diethyl ether	71	10		ug/L	1	60-29-7	1
trans-1,2-Dichloroethene	64	1		ug/L	1	156-60-5	1
trans-1,3-Dichloropropene	44	1		ug/L	1	10061-02-6	1
trans-1,4-Dichloro-2-butene	64	1		ug/L	1	110-57-6	1
Ethylbenzene	45	1		ug/L	1	100-41-4	1
2-Hexanone	Not detected	50		ug/L	1	591-78-6	1
Hexachloroethane	39	5		ug/L	1	67-72-1	1
p-Isopropyltoluene	47	5		ug/L	1	99-87-6	1
Isopropylbenzene	43	5		ug/L	1	98-82-8	1
2-Methylnaphthalene	39	5		ug/L	1	91-57-6	1
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	1
tert-Methyl butyl ether (MTBE)	68	5		ug/L	1	1634-04-4	1
Methyl iodide	59	1		ug/L	1	74-88-4	1
Methylene chloride	63	5		ug/L	1	75-09-2	1
Naphthalene	37	5		ug/L	1	91-20-3	1
n-Propylbenzene	43	1		ug/L	1	103-65-1	1
Styrene	44	1		ug/L	1	100-42-5	1
1,1,1,2-Tetrachloroethane	47	1		ug/L	1	630-20-6	1
1,1,1-Trichloroethane	48	1		ug/L	1	71-55-6	1
1,1,2,2-Tetrachloroethane	44	1		ug/L	1	79-34-5	1
1,1,2-Trichloroethane	44	1		ug/L	1	79-00-5	1
1,2,3-Trichlorobenzene	36	5		ug/L	1	87-61-6	1
1,2,3-Trichloropropane	47	1		ug/L	1	96-18-4	1
1,2,3-Trimethylbenzene	49	1		ug/L	1	526-73-8	1
1,2,4-Trichlorobenzene	36	5		ug/L	1	120-82-1	1
1,2,4-Trimethylbenzene	52	1		ug/L	1	95-63-6	1
1,3,5-Trimethylbenzene	45	1		ug/L	1	108-67-8	1
Tetrachloroethene	40	1		ug/L	1	127-18-4	1
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	1
Toluene	41	1		ug/L	1	108-88-3	1
Trichloroethene	41	1		ug/L	1	79-01-6	1
Trichlorofluoromethane	43	1		ug/L	1	75-69-4	1
Vinyl chloride	42	1		ug/L	1	75-01-4	1
o-Xylene	44	1		ug/L	1	95-47-6	1
p,m-Xylene*	89	2		ug/L	1		1

1-Spiked at 50ug/L



# Analytical Laboratory Report

Lab Sample ID: S30824.06

Sample Tag: MW-14-56\_120121

Collected Date/Time: 12/01/2021 15:30

Matrix: Groundwater

COC Reference: 141450

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 02:30, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	15	1		ug/L	1	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S30824.07

Sample Tag: MW-12-09\_120121

Collected Date/Time: 12/01/2021 10:35

Matrix: Groundwater

COC Reference: 141450

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 02:51, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S30824.08

Sample Tag: MW-14-58R\_120121

Collected Date/Time: 12/01/2021 13:05

Matrix: Groundwater

COC Reference: 141450

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/14/21 16:34, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	430	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Lab Sample ID: S30824.09

Sample Tag: DUP-04\_120121

Collected Date/Time: 12/01/2021 00:01

Matrix: Groundwater

COC Reference: 141450

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/14/21 16:55, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	410	10		ug/L	10	123-91-1	Y

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Lab Sample ID: S30824.10

Sample Tag: MW-14-59\_120121

Collected Date/Time: 12/01/2021 14:00

Matrix: Groundwater

COC Reference: 141450

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 03:52, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	36	1		ug/L	1	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S30824.11

Sample Tag: MW-14-60\_120121

Collected Date/Time: 12/01/2021 14:45

Matrix: Groundwater

COC Reference: 141450

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 04:12, 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: S30824.12

Sample Tag: MW-14-62\_120121

Collected Date/Time: 12/01/2021 15:40

Matrix: Groundwater

COC Reference: 141450

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 04:33, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	78	1		ug/L	1	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S30824.13

Sample Tag: MW-21-139\_120121

Collected Date/Time: 12/01/2021 16:25

Matrix: Groundwater

COC Reference: 141450

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 04:53, 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: S30824.14

Sample Tag: P2-MW-04\_120121

Collected Date/Time: 12/01/2021 15:45

Matrix: Groundwater

COC Reference: 137969

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 05:13, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	25	1		ug/L	1	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S30824.15

Sample Tag: Trip Blank

Collected Date/Time: 12/01/2021 00:01

Matrix: Liquid

COC Reference: 137969

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	4.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/07/21 10:40	NDK	

### Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 15:25, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



# Analytical Laboratory Report

Lab Sample ID: S30824.15 (continued)

Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 15:25, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



# Quality Control Report

Report ID: S30824.01(01)+QC01  
Generated on 12/15/2021

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

Report Produced by  
Merit Laboratories  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333

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

## Report Summary

Lab Sample ID(s): S30824.01-S30824.15  
Project: 30075941.04700 / RACER Lansing (Plant 2)  
Submitted Date/Time: 12/02/2021 08:15  
Sampled by: Donald Richmond  
P.O. #: 30075941.04700

## QC Report Sections

Cover Page (Page 26)  
Analysis Summary (Pages 27-41)  
Prep Batch Summary (Page 42)  
Surrogates per Lab Sample (Pages 43-47)  
Surrogates per QC Sample (Pages 48-53)  
Internal Standards per Lab Sample (Pages 54-66)  
Internal Standards per QC Sample (Pages 67-72)  
Batch QC Results (Pages 73-85)

## 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: S30824.01

Sample Tag: MW-15-72\_120121

Collected Date/Time: 12/01/2021 10:10

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr QC Types
<b>Organics - Volatiles</b>					
1,4-Dioxane	SW8260B - SIM	12/11/21 01:50	211210B9	VS211210W2	Yes BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 16:42	211206A9	VF211206W2	Yes BLK/LCS/LCSD/MS/MS

# QC Report - Analysis Summary

Lab Sample ID: S30824.02

Sample Tag: MW-20-130\_120121

Collected Date/Time: 12/01/2021 12:05

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 02:11	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30824.03

Sample Tag: MW-16-81\_120121

Collected Date/Time: 12/01/2021 13:25

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/10/21 17:11	211210A9	VS211210W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 16:04	211206A9	VF211206W2	Yes	BLK/LCS/LCSD/MS/MS

# QC Report - Analysis Summary

Lab Sample ID: S30824.04

Sample Tag: MW-16-81\_120121 MS

Collected Date/Time: 12/01/2021 13:25

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/10/21 15:31	211210A9	VS211210W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 13:12	211206A9	VF211206W2	Yes	BLK/LCS/LCSD/MS/MS

# QC Report - Analysis Summary

**Lab Sample ID: S30824.05**

Sample Tag: MW-16-81\_120121 MSD

Collected Date/Time: 12/01/2021 13:25

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/10/21 15:51	211210A9	VS211210W1	Yes	BLK/LCS/LCSD/MS/MS
Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 13:31	211206A9	VF211206W2	Yes	BLK/LCS/LCSD/MS/MS

# QC Report - Analysis Summary

Lab Sample ID: S30824.06

Sample Tag: MW-14-56\_120121

Collected Date/Time: 12/01/2021 15:30

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 02:30	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30824.07

Sample Tag: MW-12-09\_120121

Collected Date/Time: 12/01/2021 10:35

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 02:51	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30824.08

Sample Tag: MW-14-58R\_120121

Collected Date/Time: 12/01/2021 13:05

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/14/21 16:34	211214A9	VS211214W1	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30824.09

Sample Tag: DUP-04\_120121

Collected Date/Time: 12/01/2021 00:01

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/14/21 16:55	211214A9	VS211214W1	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30824.10

Sample Tag: MW-14-59\_120121

Collected Date/Time: 12/01/2021 14:00

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 03:52	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30824.11

Sample Tag: MW-14-60\_120121

Collected Date/Time: 12/01/2021 14:45

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 04:12	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30824.12

Sample Tag: MW-14-62\_120121

Collected Date/Time: 12/01/2021 15:40

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 04:33	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30824.13

Sample Tag: MW-21-139\_120121

Collected Date/Time: 12/01/2021 16:25

Matrix: Groundwater

COC Reference: 141450

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 04:53	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30824.14

Sample Tag: P2-MW-04\_120121

Collected Date/Time: 12/01/2021 15:45

Matrix: Groundwater

COC Reference: 137969

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 05:13	211210B9	VS211210W2	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30824.15

Sample Tag: Trip Blank

Collected Date/Time: 12/01/2021 00:01

Matrix: Liquid

COC Reference: 137969

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 15:25	211206A9	VF211206W2	Yes	BLK/LCS/LCSD/MS/MS

## QC Report - Prep Batch Summary

### Organics - Volatiles, Prep Batch ID: VF211206W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S30824.01	Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 16:42	211206A9
S30824.03	Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 16:04	211206A9
S30824.04	Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 13:12	211206A9
S30824.05	Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 13:31	211206A9
S30824.15	Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 15:25	211206A9

### Organics - Volatiles, Prep Batch ID: VS211210W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S30824.03	1,4-Dioxane	SW8260B - SIM	12/10/21 17:11	211210A9
S30824.04	1,4-Dioxane	SW8260B - SIM	12/10/21 15:31	211210A9
S30824.05	1,4-Dioxane	SW8260B - SIM	12/10/21 15:51	211210A9

### Organics - Volatiles, Prep Batch ID: VS211210W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S30824.01	1,4-Dioxane	SW8260B - SIM	12/11/21 01:50	211210B9
S30824.02	1,4-Dioxane	SW8260B - SIM	12/11/21 02:11	211210B9
S30824.06	1,4-Dioxane	SW8260B - SIM	12/11/21 02:30	211210B9
S30824.07	1,4-Dioxane	SW8260B - SIM	12/11/21 02:51	211210B9
S30824.10	1,4-Dioxane	SW8260B - SIM	12/11/21 03:52	211210B9
S30824.11	1,4-Dioxane	SW8260B - SIM	12/11/21 04:12	211210B9
S30824.12	1,4-Dioxane	SW8260B - SIM	12/11/21 04:33	211210B9
S30824.13	1,4-Dioxane	SW8260B - SIM	12/11/21 04:53	211210B9
S30824.14	1,4-Dioxane	SW8260B - SIM	12/11/21 05:13	211210B9

### Organics - Volatiles, Prep Batch ID: VS211214W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S30824.08	1,4-Dioxane	SW8260B - SIM	12/14/21 16:34	211214A9
S30824.09	1,4-Dioxane	SW8260B - SIM	12/14/21 16:55	211214A9

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30824.01

Sample Tag: MW-15-72\_120121

Collected Date/Time: 12/01/2021 10:10

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 16:42, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		94.0	80.0	124.0
1,2-Dichloroethane-D4		114.6	72.0	125.0
Toluene-D8		101.6	89.0	112.0

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30824.03

Sample Tag: MW-16-81\_120121

Collected Date/Time: 12/01/2021 13:25

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 16:04, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		<b>94.6</b>	80.0	124.0
1,2-Dichloroethane-D4		<b>116.6</b>	72.0	125.0
Toluene-D8		<b>101.7</b>	89.0	112.0

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30824.08

Sample Tag: MW-14-58R\_120121

Collected Date/Time: 12/01/2021 13:05

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211214A9, Run Date: 12/14/2021 16:34, Matrix: WW, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D		95.0	60.0	140.0

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30824.09

Sample Tag: DUP-04\_120121

Collected Date/Time: 12/01/2021 00:01

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211214A9, Run Date: 12/14/2021 16:55, Matrix: WW, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D		65.0	60.0	140.0

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30824.15

Sample Tag: Trip Blank

Collected Date/Time: 12/01/2021 00:01

Matrix: Liquid

COC Reference: 137969

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 15:25, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		93.0	80.0	124.0
1,2-Dichloroethane-D4		109.2	72.0	125.0
Toluene-D8		101.5	89.0	112.0

## QC Report - Surrogates per QC Sample

### Organics - Volatiles, Prep Batch ID: VF211206W2

QC Types: BLK/LCS/LCSD/MS/MSD

#### Blank (BLK)

Lab Sample ID: 211206A9.BLKW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 15:06, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		93.4	80.0	124.0
1,2-Dichloroethane-D4		108.5	72.0	125.0
Toluene-D8		100.5	89.0	112.0

#### Laboratory Control Sample (LCS)

Lab Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:15, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		92.9	80.0	124.0
1,2-Dichloroethane-D4		96.4	72.0	125.0
Toluene-D8		100.0	89.0	112.0

#### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211206A9.LCSDW06A, Parent Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:34, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		94.5	80.0	124.0
1,2-Dichloroethane-D4		103.0	72.0	125.0
Toluene-D8		99.9	89.0	112.0

#### Matrix Spike (MS)

Lab Sample ID: 211206A9.3082404M, Parent Sample ID: S30824.03

Run in Batch: 211206A9, Run Date: 12/06/2021 13:12, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		93.7	80.0	124.0
1,2-Dichloroethane-D4		105.8	72.0	125.0
Toluene-D8		100.6	89.0	112.0

#### Matrix Spike (MS)

Lab Sample ID: 211206A9.3094907M, Parent Sample ID: S30949.04

Run in Batch: 211206A9, Run Date: 12/06/2021 13:50, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		96.3	80.0	124.0
1,2-Dichloroethane-D4		113.6	72.0	125.0
Toluene-D8		102.2	89.0	112.0

# QC Report - Surrogates per QC Sample

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211206A9.3082405N, Parent Sample ID: 211206A9.3082404M

Run in Batch: 211206A9, Run Date: 12/06/2021 13:31, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		<b>91.3</b>	80.0	124.0
1,2-Dichloroethane-D4		<b>110.3</b>	72.0	125.0
Toluene-D8	*	<b>87.2</b>	89.0	112.0

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211206A9.3094908N, Parent Sample ID: 211206A9.3094907M

Run in Batch: 211206A9, Run Date: 12/06/2021 14:09, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		<b>94.5</b>	80.0	124.0
1,2-Dichloroethane-D4		<b>110.5</b>	72.0	125.0
Toluene-D8		<b>101.6</b>	89.0	112.0

# QC Report - Surrogates per QC Sample

## Organics - Volatiles, Prep Batch ID: VS211210W1

QC Types: BLK/LCS/LCSD/MS/MSD

### Blank (BLK)

Lab Sample ID: 211210A9.BLKW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 16:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Laboratory Control Sample (LCS)

Lab Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:08, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211210A9.LCSDW10A, Parent Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Matrix Spike (MS)

Lab Sample ID: 211210A9.3082113M, Parent Sample ID: S30821.12

Run in Batch: 211210A9, Run Date: 12/10/2021 12:49, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Matrix Spike (MS)

Lab Sample ID: 211210A9.3082404R, Parent Sample ID: S30824.03

Run in Batch: 211210A9, Run Date: 12/10/2021 15:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Matrix Spike (MS)

Lab Sample ID: 211210A9.3102906M, Parent Sample ID: S31029.05

Run in Batch: 211210A9, Run Date: 12/10/2021 14:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Matrix Spike (MS)

Lab Sample ID: 211210A9.3103104M, Parent Sample ID: S31031.03

Run in Batch: 211210A9, Run Date: 12/10/2021 14:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

# QC Report - Surrogates per QC Sample

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3082114N, Parent Sample ID: 211210A9.3082113M

Run in Batch: 211210A9, Run Date: 12/10/2021 13:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3082405R, Parent Sample ID: 211210A9.3082404R

Run in Batch: 211210A9, Run Date: 12/10/2021 15:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3102907N, Parent Sample ID: 211210A9.3102906M

Run in Batch: 211210A9, Run Date: 12/10/2021 14:30, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3103105N, Parent Sample ID: 211210A9.3103104M

Run in Batch: 211210A9, Run Date: 12/10/2021 15:11, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

# QC Report - Surrogates per QC Sample

## Organics - Volatiles, Prep Batch ID: VS211210W2

QC Types: BLK/LCS/LCSD

### Blank (BLK)

Lab Sample ID: 211210B9.BLKW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 23:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Laboratory Control Sample (LCS)

Lab Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:28, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211210B9.LCSDW10B, Parent Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:48, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

# QC Report - Surrogates per QC Sample

## Organics - Volatiles, Prep Batch ID: VS211214W1

QC Types: BLK/LCS/LCSD

### Blank (BLK)

Lab Sample ID: 211214A9.BLKW14A

Run in Batch: 211214A9, Run Date: 12/14/2021 15:49, Prep Date: 12/14/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D		62.5	60.0	140.0

### Laboratory Control Sample (LCS)

Lab Sample ID: 211214A9.LCSW14A

Run in Batch: 211214A9, Run Date: 12/14/2021 12:50, Prep Date: 12/14/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D		72.5	60.0	140.0

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211214A9.LCSDW14A, Parent Sample ID: 211214A9.LCSW14A

Run in Batch: 211214A9, Run Date: 12/14/2021 13:10, Prep Date: 12/14/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
BROMOFORM-D		102.5	60.0	140.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.01

Sample Tag: MW-15-72\_120121

Collected Date/Time: 12/01/2021 10:10

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 01:50, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		98.2	50.0	200.0
1,4-Dioxane-D8		100.0	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		90.6	50.0	200.0

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 16:42, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		87.4	50.0	200.0
1,4-Difluorobenzene		92.9	50.0	200.0
Chlorobenzene-D5		96.4	50.0	200.0
1,4-Dichlorobenzene-D4		98.2	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.02

Sample Tag: MW-20-130\_120121

Collected Date/Time: 12/01/2021 12:05

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 02:11, 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		94.3	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		98.9	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.03

Sample Tag: MW-16-81\_120121

Collected Date/Time: 12/01/2021 13:25

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210A9, Run Date: 12/10/2021 17:11, Matrix: WW, Dilution: 10

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		89.6	50.0	200.0
1,4-Dioxane-D8		101.1	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		71.8	50.0	200.0

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 16:04, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		88.1	50.0	200.0
1,4-Difluorobenzene		94.0	50.0	200.0
Chlorobenzene-D5		97.4	50.0	200.0
1,4-Dichlorobenzene-D4		124.6	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.06

Sample Tag: MW-14-56\_120121

Collected Date/Time: 12/01/2021 15:30

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 02:30, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		99.7	50.0	200.0
1,4-Dioxane-D8		101.1	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		106.1	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.07

Sample Tag: MW-12-09\_120121

Collected Date/Time: 12/01/2021 10:35

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 02:51, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>100.4</b>	50.0	200.0
1,4-Dioxane-D8		<b>89.6</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>85.3</b>	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.08

Sample Tag: MW-14-58R\_120121

Collected Date/Time: 12/01/2021 13:05

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211214A9, Run Date: 12/14/2021 16:34, Matrix: WW, Dilution: 10

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		101.5	50.0	200.0
1,4-Dioxane-D8		77.8	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		72.3	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.09

Sample Tag: DUP-04\_120121

Collected Date/Time: 12/01/2021 00:01

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211214A9, Run Date: 12/14/2021 16:55, Matrix: WW, Dilution: 10

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		154.6	50.0	200.0
1,4-Dioxane-D8		131.2	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		91.0	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.10

Sample Tag: MW-14-59\_120121

Collected Date/Time: 12/01/2021 14:00

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 03:52, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		95.5	50.0	200.0
1,4-Dioxane-D8		94.9	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		80.3	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.11

Sample Tag: MW-14-60\_120121

Collected Date/Time: 12/01/2021 14:45

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 04:12, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		94.9	50.0	200.0
1,4-Dioxane-D8		92.7	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		95.9	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.12

Sample Tag: MW-14-62\_120121

Collected Date/Time: 12/01/2021 15:40

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 04:33, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		99.7	50.0	200.0
1,4-Dioxane-D8		104.5	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		88.4	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.13

Sample Tag: MW-21-139\_120121

Collected Date/Time: 12/01/2021 16:25

Matrix: Groundwater

COC Reference: 141450

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 04:53, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>96.5</b>	50.0	200.0
1,4-Dioxane-D8		<b>102.0</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>83.3</b>	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.14

Sample Tag: P2-MW-04\_120121

Collected Date/Time: 12/01/2021 15:45

Matrix: Groundwater

COC Reference: 137969

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210B9, Run Date: 12/11/2021 05:13, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>98.0</b>	50.0	200.0
1,4-Dioxane-D8		<b>105.2</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>85.6</b>	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30824.15

Sample Tag: Trip Blank

Collected Date/Time: 12/01/2021 00:01

Matrix: Liquid

COC Reference: 137969

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 15:25, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		92.6	50.0	200.0
1,4-Difluorobenzene		97.5	50.0	200.0
Chlorobenzene-D5		100.2	50.0	200.0
1,4-Dichlorobenzene-D4		100.9	50.0	200.0

**QC Report - Internal Standards per QC Sample**

**Organics - Volatiles, Prep Batch ID: VF211206W2**

QC Types: BLK/LCS/LCSD/MS/MSD

**Blank (BLK)**

Lab Sample ID: 211206A9.BLKW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 15:06, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>90.2</b>	50.0	200.0
1,4-Difluorobenzene		<b>95.3</b>	50.0	200.0
Chlorobenzene-D5		<b>96.8</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>96.7</b>	50.0	200.0

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:15, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>96.0</b>	50.0	200.0
1,4-Difluorobenzene		<b>96.2</b>	50.0	200.0
Chlorobenzene-D5		<b>94.6</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>92.3</b>	50.0	200.0

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211206A9.LCSDW06A, Parent Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:34, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>95.2</b>	50.0	200.0
1,4-Difluorobenzene		<b>95.9</b>	50.0	200.0
Chlorobenzene-D5		<b>94.7</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>95.0</b>	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211206A9.3082404M, Parent Sample ID: S30824.03

Run in Batch: 211206A9, Run Date: 12/06/2021 13:12, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>93.7</b>	50.0	200.0
1,4-Difluorobenzene		<b>96.8</b>	50.0	200.0
Chlorobenzene-D5		<b>97.7</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>97.1</b>	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211206A9.3094907M, Parent Sample ID: S30949.04

Run in Batch: 211206A9, Run Date: 12/06/2021 13:50, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>91.6</b>	50.0	200.0
1,4-Difluorobenzene		<b>95.5</b>	50.0	200.0
Chlorobenzene-D5		<b>99.1</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>102.6</b>	50.0	200.0

# QC Report - Internal Standards per QC Sample

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211206A9.3082405N, Parent Sample ID: 211206A9.3082404M

Run in Batch: 211206A9, Run Date: 12/06/2021 13:31, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>113.1</b>	50.0	200.0
1,4-Difluorobenzene		<b>111.7</b>	50.0	200.0
Chlorobenzene-D5		<b>101.8</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>112.9</b>	50.0	200.0

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211206A9.3094908N, Parent Sample ID: 211206A9.3094907M

Run in Batch: 211206A9, Run Date: 12/06/2021 14:09, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>89.2</b>	50.0	200.0
1,4-Difluorobenzene		<b>93.5</b>	50.0	200.0
Chlorobenzene-D5		<b>96.1</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>96.7</b>	50.0	200.0

**QC Report - Internal Standards per QC Sample**

**Organics - Volatiles, Prep Batch ID: VS211210W1**

QC Types: BLK/LCS/LCSD/MS/MSD

**Blank (BLK)**

Lab Sample ID: 211210A9.BLKW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 16:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>85.3</b>	50.0	200.0
1,4-Dioxane-D8		<b>95.9</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>69.9</b>	50.0	200.0

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:08, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>104.5</b>	50.0	200.0
1,4-Dioxane-D8		<b>126.3</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>92.4</b>	50.0	200.0

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211210A9.LCSDW10A, Parent Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>109.7</b>	50.0	200.0
1,4-Dioxane-D8		<b>125.3</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>108.6</b>	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3082113M, Parent Sample ID: S30821.12

Run in Batch: 211210A9, Run Date: 12/10/2021 12:49, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>97.2</b>	50.0	200.0
1,4-Dioxane-D8		<b>102.9</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>92.7</b>	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3082404R, Parent Sample ID: S30824.03

Run in Batch: 211210A9, Run Date: 12/10/2021 15:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>93.1</b>	50.0	200.0
1,4-Dioxane-D8		<b>109.8</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>74.1</b>	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3102906M, Parent Sample ID: S31029.05

Run in Batch: 211210A9, Run Date: 12/10/2021 14:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>92.2</b>	50.0	200.0
1,4-Dioxane-D8		<b>99.8</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>78.0</b>	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3103104M, Parent Sample ID: S31031.03

Run in Batch: 211210A9, Run Date: 12/10/2021 14:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>93.1</b>	50.0	200.0
1,4-Dioxane-D8		<b>101.7</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>76.3</b>	50.0	200.0

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211210A9.3082114N, Parent Sample ID: 211210A9.3082113M

Run in Batch: 211210A9, Run Date: 12/10/2021 13:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>92.6</b>	50.0	200.0
1,4-Dioxane-D8		<b>100.3</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>77.9</b>	50.0	200.0

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211210A9.3082405R, Parent Sample ID: 211210A9.3082404R

Run in Batch: 211210A9, Run Date: 12/10/2021 15:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>92.1</b>	50.0	200.0
1,4-Dioxane-D8		<b>103.9</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>74.1</b>	50.0	200.0

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211210A9.3102907N, Parent Sample ID: 211210A9.3102906M

Run in Batch: 211210A9, Run Date: 12/10/2021 14:30, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>91.3</b>	50.0	200.0
1,4-Dioxane-D8		<b>103.1</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>75.0</b>	50.0	200.0

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211210A9.3103105N, Parent Sample ID: 211210A9.3103104M

Run in Batch: 211210A9, Run Date: 12/10/2021 15:11, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>84.7</b>	50.0	200.0
1,4-Dioxane-D8		<b>102.2</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>72.1</b>	50.0	200.0

# QC Report - Internal Standards per QC Sample

## Organics - Volatiles, Prep Batch ID: VS211210W2

QC Types: BLK/LCS/LCSD

### Blank (BLK)

Lab Sample ID: 211210B9.BLKW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 23:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		87.9	50.0	200.0
1,4-Dioxane-D8		83.1	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		95.2	50.0	200.0

### Laboratory Control Sample (LCS)

Lab Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:28, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		91.0	50.0	200.0
1,4-Dioxane-D8		97.4	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		86.5	50.0	200.0

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211210B9.LCSDW10B, Parent Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:48, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		96.2	50.0	200.0
1,4-Dioxane-D8		107.7	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		88.9	50.0	200.0

# QC Report - Internal Standards per QC Sample

## Organics - Volatiles, Prep Batch ID: VS211214W1

QC Types: BLK/LCS/LCSD

### Blank (BLK)

Lab Sample ID: 211214A9.BLKW14A

Run in Batch: 211214A9, Run Date: 12/14/2021 15:49, Prep Date: 12/14/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>108.2</b>	50.0	200.0
1,4-Dioxane-D8		<b>95.7</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>66.5</b>	50.0	200.0

### Laboratory Control Sample (LCS)

Lab Sample ID: 211214A9.LCSW14A

Run in Batch: 211214A9, Run Date: 12/14/2021 12:50, Prep Date: 12/14/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>96.4</b>	50.0	200.0
1,4-Dioxane-D8		<b>105.8</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>79.7</b>	50.0	200.0

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211214A9.LCSDW14A, Parent Sample ID: 211214A9.LCSW14A

Run in Batch: 211214A9, Run Date: 12/14/2021 13:10, Prep Date: 12/14/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>93.3</b>	50.0	200.0
1,4-Dioxane-D8		<b>94.3</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>73.1</b>	50.0	200.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2**

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

**Blank (BLK)**

Lab Sample ID: 211206A9.BLKW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 15:06, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acetone		ND	10.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Benzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Bromoform		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Chloroform		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Diethyl ether		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
2-Hexanone		ND	10.00	ug/l
Hexachloroethane		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Methyl iodide		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Blank (BLK) (continued)**

Lab Sample ID: 211206A9.BLKW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 15:06, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Naphthalene		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Toluene		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:15, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acetone		105.1	29.9	161.5
Acrylonitrile		103.4	69.9	128.9
2-Butanone (MEK)		100.4	44.0	134.4
Benzene		98.9	79.9	124.9
n-Butylbenzene		98.3	80.0	133.3
Bromobenzene		92.5	78.7	124.6
Bromochloromethane		97.5	78.2	120.8
Bromodichloromethane		98.8	80.4	128.2
Bromoform		94.1	69.4	128.0
Bromomethane		109.1	56.8	151.3
sec-Butylbenzene		100.7	77.4	129.8
tert-Butylbenzene		93.4	80.7	128.9
Carbon disulfide		95.8	63.8	137.4
Carbon tetrachloride		95.4	72.6	133.0
Chlorobenzene		97.3	79.2	122.7
Chloroethane		109.1	53.4	149.4
Chloroform		98.7	78.4	124.0
Chloromethane		97.6	23.8	166.5
1,1-Dichloroethane		98.8	71.5	126.2
1,1-Dichloroethene		97.9	69.6	139.4

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Laboratory Control Sample (LCS) (continued)**

Lab Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:15, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,2-Dibromo-3-chloropropane		92.9	21.2	189.4
1,2-Dibromoethane		97.5	70.3	133.7
1,2-Dichlorobenzene		94.2	10.0	166.2
1,2-Dichloroethane		96.8	76.0	126.3
1,2-Dichloropropane		99.4	78.6	126.4
1,3-Dichlorobenzene		100.5	77.0	131.3
1,4-Dichlorobenzene		98.7	20.7	137.7
cis-1,2-Dichloroethene		98.5	76.6	122.1
cis-1,3-Dichloropropene		100.6	79.8	129.9
Dibromochloromethane		98.2	74.6	127.2
Dibromomethane		96.2	76.9	122.1
Dichlorodifluoromethane		83.2	10.0	222.8
Diethyl ether		100.1	67.4	121.2
trans-1,2-Dichloroethene		98.1	73.6	129.3
trans-1,3-Dichloropropene		99.7	74.0	131.3
trans-1,4-Dichloro-2-butene		126.3	68.6	135.4
Ethylbenzene		97.9	79.5	129.1
2-Hexanone		102.0	55.4	136.9
Hexachloroethane		97.3	23.8	138.1
p-Isopropyltoluene		105.3	79.8	137.5
Isopropylbenzene		94.6	74.4	121.5
2-Methylnaphthalene		110.3	25.5	165.5
4-Methyl-2-pentanone (MIBK)		99.7	71.6	125.2
tert-Methyl butyl ether (MTBE)		101.3	73.2	122.4
Methyl iodide		99.1	68.8	116.4
Methylene chloride		95.2	73.3	121.1
Naphthalene		85.0	32.9	135.8
n-Propylbenzene		94.0	82.0	130.7
Styrene		96.0	69.5	126.7
1,1,1,2-Tetrachloroethane		99.6	80.3	128.2
1,1,1-Trichloroethane		97.5	79.4	130.9
1,1,2,2-Tetrachloroethane		87.7	79.8	126.3
1,1,2-Trichloroethane		99.0	78.7	123.1
1,2,3-Trichlorobenzene		86.4	75.4	131.4
1,2,3-Trichloropropane		91.6	78.3	138.8
1,2,3-Trimethylbenzene		105.4	76.3	124.2
1,2,4-Trichlorobenzene		85.5	27.4	143.4
1,2,4-Trimethylbenzene		94.8	81.4	130.8
1,3,5-Trimethylbenzene		96.2	81.3	128.9
Tetrachloroethene		94.9	74.5	124.5
Tetrahydrofuran		99.9	59.0	117.9
Toluene		97.1	79.8	124.5
Trichloroethene		98.7	79.7	124.2
Trichlorofluoromethane		97.4	59.7	151.8
Vinyl chloride		100.1	43.5	149.1
o-Xylene		94.8	80.2	131.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Laboratory Control Sample (LCS) (continued)**

Lab Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:15, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
p,m-Xylene		98.1	79.4	132.2

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211206A9.LCSDW06A, Parent Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:34, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acetone		107.6	29.9	161.5	2.4	30.0
Acrylonitrile		106.2	69.9	128.9	2.7	30.0
2-Butanone (MEK)		106.8	44.0	134.4	6.2	30.0
Benzene		96.4	79.9	124.9	2.5	30.0
n-Butylbenzene		92.9	80.0	133.3	5.6	30.0
Bromobenzene		92.7	78.7	124.6	0.2	30.0
Bromochloromethane		98.1	78.2	120.8	0.7	30.0
Bromodichloromethane		98.7	80.4	128.2	0.1	30.0
Bromoform		95.2	69.4	128.0	1.2	30.0
Bromomethane		106.4	56.8	151.3	2.5	30.0
sec-Butylbenzene		96.5	77.4	129.8	4.2	30.0
tert-Butylbenzene		93.2	80.7	128.9	0.3	30.0
Carbon disulfide		91.3	63.8	137.4	4.9	30.0
Carbon tetrachloride		92.1	72.6	133.0	3.5	30.0
Chlorobenzene		94.7	79.2	122.7	2.7	30.0
Chloroethane		107.5	53.4	149.4	1.5	30.0
Chloroform		96.1	78.4	124.0	2.7	30.0
Chloromethane		102.0	23.8	166.5	4.5	30.0
1,1-Dichloroethane		97.8	71.5	126.2	1.1	30.0
1,1-Dichloroethene		92.7	69.6	139.4	5.5	30.0
1,2-Dibromo-3-chloropropane		98.6	21.2	189.4	5.9	30.0
1,2-Dibromoethane		99.9	70.3	133.7	2.5	30.0
1,2-Dichlorobenzene		93.5	10.0	166.2	0.8	30.0
1,2-Dichloroethane		96.3	76.0	126.3	0.5	30.0
1,2-Dichloropropane		97.5	78.6	126.4	1.9	30.0
1,3-Dichlorobenzene		97.9	77.0	131.3	2.6	30.0
1,4-Dichlorobenzene		95.2	20.7	137.7	3.6	30.0
cis-1,2-Dichloroethene		96.1	76.6	122.1	2.5	30.0
cis-1,3-Dichloropropene		99.0	79.8	129.9	1.6	30.0
Dibromochloromethane		100.2	74.6	127.2	2.0	30.0
Dibromomethane		97.0	76.9	122.1	0.9	30.0
Dichlorodifluoromethane		79.9	10.0	222.8	4.1	30.0
Diethyl ether		99.9	67.4	121.2	0.2	30.0
trans-1,2-Dichloroethene		95.4	73.6	129.3	2.8	30.0
trans-1,3-Dichloropropene		102.5	74.0	131.3	2.8	30.0
trans-1,4-Dichloro-2-butene		125.9	68.6	135.4	0.3	30.0
Ethylbenzene		96.8	79.5	129.1	1.1	30.0
2-Hexanone		108.5	55.4	136.9	6.2	30.0
Hexachloroethane		92.8	23.8	138.1	4.7	30.0
p-Isopropyltoluene		100.2	79.8	137.5	5.0	30.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Laboratory Control Sample Duplicate (LCSD) (continued)**

Lab Sample ID: 211206A9.LCSDW06A, Parent Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:34, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isopropylbenzene		92.5	74.4	121.5	2.3	30.0
2-Methylnaphthalene		119.3	25.5	165.5	7.9	30.0
4-Methyl-2-pentanone (MIBK)		106.4	71.6	125.2	6.5	30.0
tert-Methyl butyl ether (MTBE)		106.0	73.2	122.4	4.6	30.0
Methyl iodide		96.6	68.8	116.4	2.5	30.0
Methylene chloride		93.7	73.3	121.1	1.6	30.0
Naphthalene		87.6	32.9	135.8	2.9	30.0
n-Propylbenzene		91.1	82.0	130.7	3.0	30.0
Styrene		95.1	69.5	126.7	0.9	30.0
1,1,1,2-Tetrachloroethane		100.8	80.3	128.2	1.2	30.0
1,1,1-Trichloroethane		94.2	79.4	130.9	3.5	30.0
1,1,2,2-Tetrachloroethane		91.3	79.8	126.3	4.1	30.0
1,1,2-Trichloroethane		100.5	78.7	123.1	1.5	30.0
1,2,3-Trichlorobenzene		85.7	75.4	131.4	0.9	30.0
1,2,3-Trichloropropane		95.0	78.3	138.8	3.6	30.0
1,2,3-Trimethylbenzene		100.0	76.3	124.2	5.2	30.0
1,2,4-Trichlorobenzene		83.8	27.4	143.4	1.9	30.0
1,2,4-Trimethylbenzene		103.3	81.4	130.8	8.6	30.0
1,3,5-Trimethylbenzene		93.3	81.3	128.9	3.1	30.0
Tetrachloroethene		92.1	74.5	124.5	3.0	30.0
Tetrahydrofuran		106.0	59.0	117.9	5.9	30.0
Toluene		95.4	79.8	124.5	1.7	30.0
Trichloroethene		94.7	79.7	124.2	4.1	30.0
Trichlorofluoromethane		88.0	59.7	151.8	10.1	30.0
Vinyl chloride		101.1	43.5	149.1	1.0	30.0
o-Xylene		93.4	80.2	131.0	1.5	30.0
p,m-Xylene		100.8	79.4	132.2	2.7	30.0

**Matrix Spike (MS)**

Lab Sample ID: 211206A9.3082404M, Parent Sample ID: S30824.03

Run in Batch: 211206A9, Run Date: 12/06/2021 13:12, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acetone		101.4	29.9	161.5
Acrylonitrile		105.4	69.9	128.9
2-Butanone (MEK)		105.6	44.0	134.4
Benzene		98.0	79.9	124.9
n-Butylbenzene		93.6	80.0	133.3
Bromobenzene		93.4	78.7	124.6
Bromochloromethane		102.5	78.2	120.8
Bromodichloromethane		100.8	80.4	128.2
Bromoform		92.4	69.4	128.0
Bromomethane		98.0	56.8	151.3
sec-Butylbenzene		96.0	77.4	129.8
tert-Butylbenzene		91.2	80.7	128.9
Carbon disulfide		93.4	63.8	137.4
Carbon tetrachloride		95.6	72.6	133.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Matrix Spike (MS) (continued)**

Lab Sample ID: 211206A9.3082404M, Parent Sample ID: S30824.03

Run in Batch: 211206A9, Run Date: 12/06/2021 13:12, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Chlorobenzene		94.8	79.2	122.7
Chloroethane		100.4	53.4	149.4
Chloroform		102.3	78.4	124.0
Chloromethane		100.2	23.8	166.5
1,1-Dichloroethane		102.1	71.5	126.2
1,1-Dichloroethene		98.9	69.6	139.4
1,2-Dibromo-3-chloropropane		102.6	21.2	189.4
1,2-Dibromoethane		96.9	70.3	133.7
1,2-Dichlorobenzene		90.9	10.0	166.2
1,2-Dichloroethane		97.7	76.0	126.3
1,2-Dichloropropane		101.2	78.6	126.4
1,3-Dichlorobenzene		98.1	77.0	131.3
1,4-Dichlorobenzene		96.0	20.7	137.7
cis-1,2-Dichloroethene		102.5	76.6	122.1
cis-1,3-Dichloropropene		100.8	79.8	129.9
Dibromochloromethane		98.0	74.6	127.2
Dibromomethane		99.2	76.9	122.1
Dichlorodifluoromethane		89.7	10.0	222.8
Diethyl ether		104.1	67.4	121.2
trans-1,2-Dichloroethene		100.7	73.6	129.3
trans-1,3-Dichloropropene		101.0	74.0	131.3
trans-1,4-Dichloro-2-butene		120.1	68.6	135.4
Ethylbenzene		95.3	79.5	129.1
2-Hexanone		99.6	55.4	136.9
Hexachloroethane		92.3	23.8	138.1
p-Isopropyltoluene		100.4	79.8	137.5
Isopropylbenzene		91.3	74.4	121.5
2-Methylnaphthalene		80.7	25.5	165.5
4-Methyl-2-pentanone (MIBK)		101.9	71.6	125.2
tert-Methyl butyl ether (MTBE)		107.4	73.2	122.4
Methyl iodide		101.6	68.8	116.4
Methylene chloride		98.3	73.3	121.1
Naphthalene		106.7	32.9	135.8
n-Propylbenzene		91.5	82.0	130.7
Styrene		94.3	69.5	126.7
1,1,1,2-Tetrachloroethane		99.1	80.3	128.2
1,1,1-Trichloroethane		100.1	79.4	130.9
1,1,2,2-Tetrachloroethane		87.5	79.8	126.3
1,1,2-Trichloroethane		100.2	78.7	123.1
1,2,3-Trichlorobenzene		96.4	75.4	131.4
1,2,3-Trichloropropane		90.7	78.3	138.8
1,2,3-Trimethylbenzene		100.8	76.3	124.2
1,2,4-Trichlorobenzene		108.1	27.4	143.4
1,2,4-Trimethylbenzene		91.8	81.4	130.8
1,3,5-Trimethylbenzene		93.0	81.3	128.9
Tetrachloroethene		93.6	74.5	124.5

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Matrix Spike (MS) (continued)**

Lab Sample ID: 211206A9.3082404M, Parent Sample ID: S30824.03

Run in Batch: 211206A9, Run Date: 12/06/2021 13:12, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Tetrahydrofuran		102.6	59.0	117.9
Toluene		97.1	79.8	124.5
Trichloroethene		98.3	79.7	124.2
Trichlorofluoromethane		99.3	59.7	151.8
Vinyl chloride		95.4	43.5	149.1
o-Xylene		94.1	80.2	131.0
p,m-Xylene		95.5	79.4	132.2

**Matrix Spike (MS)**

Lab Sample ID: 211206A9.3094907M, Parent Sample ID: S30949.04

Run in Batch: 211206A9, Run Date: 12/06/2021 13:50, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Benzene		99.6	79.9	124.9
Ethylbenzene		94.6	79.5	129.1
tert-Methyl butyl ether (MTBE)		117.5	73.2	122.4
1,2,4-Trimethylbenzene		92.2	81.4	130.8
1,3,5-Trimethylbenzene		92.6	81.3	128.9
Toluene		98.9	79.8	124.5
o-Xylene		92.7	80.2	131.0
p,m-Xylene		94.3	79.4	132.2

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211206A9.3082405N, Parent Sample ID: 211206A9.3082404M

Run in Batch: 211206A9, Run Date: 12/06/2021 13:31, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acetone	*	148.3	29.9	161.5	37.4	30.0
Acrylonitrile	*	152.7	69.9	128.9	36.7	30.0
2-Butanone (MEK)	*	137.1	44.0	134.4	25.9	30.0
Benzene		100.8	79.9	124.9	2.8	30.0
n-Butylbenzene	*	79.1	80.0	133.3	16.8	30.0
Bromobenzene		88.6	78.7	124.6	5.2	30.0
Bromochloromethane		117.7	78.2	120.8	13.8	30.0
Bromodichloromethane		84.7	80.4	128.2	17.3	30.0
Bromoform		90.1	69.4	128.0	2.6	30.0
Bromomethane		86.8	56.8	151.3	12.1	30.0
sec-Butylbenzene		94.6	77.4	129.8	1.5	30.0
tert-Butylbenzene		98.2	80.7	128.9	7.3	30.0
Carbon disulfide		118.5	63.8	137.4	23.6	30.0
Carbon tetrachloride		91.6	72.6	133.0	4.2	30.0
Chlorobenzene		91.2	79.2	122.7	3.9	30.0
Chloroethane		91.2	53.4	149.4	9.6	30.0
Chloroform		115.9	78.4	124.0	12.4	30.0
Chloromethane		84.8	23.8	166.5	16.7	30.0
1,1-Dichloroethane	*	131.7	71.5	126.2	25.4	30.0
1,1-Dichloroethene		122.9	69.6	139.4	21.7	30.0
1,2-Dibromo-3-chloropropane		83.3	21.2	189.4	20.8	30.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Matrix Spike Duplicate (MSD) (continued)**

Lab Sample ID: 211206A9.3082405N, Parent Sample ID: 211206A9.3082404M

Run in Batch: 211206A9, Run Date: 12/06/2021 13:31, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,2-Dibromoethane		95.3	70.3	133.7	1.7	30.0
1,2-Dichlorobenzene		77.8	10.0	166.2	15.4	30.0
1,2-Dichloroethane		96.4	76.0	126.3	1.3	30.0
1,2-Dichloropropane		85.5	78.6	126.4	16.9	30.0
1,3-Dichlorobenzene		91.6	77.0	131.3	6.9	30.0
1,4-Dichlorobenzene		98.3	20.7	137.7	2.4	30.0
cis-1,2-Dichloroethene	*	124.1	76.6	122.1	19.1	30.0
cis-1,3-Dichloropropene		86.5	79.8	129.9	15.2	30.0
Dibromochloromethane		93.6	74.6	127.2	4.6	30.0
Dibromomethane		84.8	76.9	122.1	15.6	30.0
Dichlorodifluoromethane	*	64.4	10.0	222.8	32.8	30.0
Diethyl ether	*	143.0	67.4	121.2	31.5	30.0
trans-1,2-Dichloroethene		127.5	73.6	129.3	23.5	30.0
trans-1,3-Dichloropropene		87.4	74.0	131.3	14.4	30.0
trans-1,4-Dichloro-2-butene		127.8	68.6	135.4	6.3	30.0
Ethylbenzene		90.0	79.5	129.1	5.8	30.0
2-Hexanone		94.4	55.4	136.9	5.3	30.0
Hexachloroethane		78.5	23.8	138.1	16.3	30.0
p-Isopropyltoluene		93.7	79.8	137.5	6.8	30.0
Isopropylbenzene		87.0	74.4	121.5	4.9	30.0
2-Methylnaphthalene		77.4	25.5	165.5	4.1	30.0
4-Methyl-2-pentanone (MIBK)		92.5	71.6	125.2	9.7	30.0
tert-Methyl butyl ether (MTBE)	*	135.4	73.2	122.4	23.0	30.0
Methyl iodide	*	118.4	68.8	116.4	15.2	30.0
Methylene chloride	*	126.3	73.3	121.1	25.0	30.0
Naphthalene	*	73.3	32.9	135.8	37.0	30.0
n-Propylbenzene		85.2	82.0	130.7	7.1	30.0
Styrene		88.7	69.5	126.7	6.1	30.0
1,1,1,2-Tetrachloroethane		93.8	80.3	128.2	5.5	30.0
1,1,1-Trichloroethane		96.0	79.4	130.9	4.1	30.0
1,1,2,2-Tetrachloroethane		87.5	79.8	126.3	0.0	30.0
1,1,2-Trichloroethane		87.9	78.7	123.1	13.1	30.0
1,2,3-Trichlorobenzene	*	72.0	75.4	131.4	29.0	30.0
1,2,3-Trichloropropane		94.4	78.3	138.8	4.0	30.0
1,2,3-Trimethylbenzene		98.5	76.3	124.2	2.3	30.0
1,2,4-Trichlorobenzene	*	71.3	27.4	143.4	41.0	30.0
1,2,4-Trimethylbenzene		103.8	81.4	130.8	12.3	30.0
1,3,5-Trimethylbenzene		89.0	81.3	128.9	4.4	30.0
Tetrachloroethene		79.6	74.5	124.5	16.2	30.0
Tetrahydrofuran	*	136.8	59.0	117.9	28.6	30.0
Toluene		81.6	79.8	124.5	17.4	30.0
Trichloroethene		81.4	79.7	124.2	18.9	30.0
Trichlorofluoromethane		86.5	59.7	151.8	13.8	30.0
Vinyl chloride		83.5	43.5	149.1	13.3	30.0
o-Xylene		87.8	80.2	131.0	6.9	30.0
p,m-Xylene		88.7	79.4	132.2	7.4	30.0

# QC Report - Batch QC Results

## Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)

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

### Matrix Spike Duplicate (MSD)

Lab Sample ID: 211206A9.3094908N, Parent Sample ID: 211206A9.3094907M

Run in Batch: 211206A9, Run Date: 12/06/2021 14:09, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Benzene		98.3	79.9	124.9	1.3	30.0
Ethylbenzene		94.2	79.5	129.1	0.5	30.0
tert-Methyl butyl ether (MTBE)		113.7	73.2	122.4	3.3	30.0
1,2,4-Trimethylbenzene		91.3	81.4	130.8	0.9	30.0
1,3,5-Trimethylbenzene		92.4	81.3	128.9	0.2	30.0
Toluene		98.0	79.8	124.5	0.9	30.0
o-Xylene		93.5	80.2	131.0	0.8	30.0
p,m-Xylene		93.9	79.4	132.2	0.4	30.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VS211210W1**

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

**Blank (BLK)**

Lab Sample ID: 211210A9.BLKW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 16:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:08, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		97.0	70.0	130.0

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211210A9.LCSDW10A, Parent Sample ID: 211210A9.LCSW10A

Run in Batch: 211210A9, Run Date: 12/10/2021 12:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		101.1	70.0	130.0	4.1	30.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3082113M, Parent Sample ID: S30821.12

Run in Batch: 211210A9, Run Date: 12/10/2021 12:49, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		121.4	70.0	130.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3082404R, Parent Sample ID: S30824.03

Run in Batch: 211210A9, Run Date: 12/10/2021 15:31, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		106.0	70.0	130.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3102906M, Parent Sample ID: S31029.05

Run in Batch: 211210A9, Run Date: 12/10/2021 14:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		124.2	70.0	130.0

**Matrix Spike (MS)**

Lab Sample ID: 211210A9.3103104M, Parent Sample ID: S31031.03

Run in Batch: 211210A9, Run Date: 12/10/2021 14:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane	*	145.1	70.0	130.0

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211210A9.3082114N, Parent Sample ID: 211210A9.3082113M

Run in Batch: 211210A9, Run Date: 12/10/2021 13:10, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		110.4	70.0	130.0	9.3	30.0

# QC Report - Batch QC Results

## Organics - Volatiles, Prep Batch ID: VS211210W1 (continued)

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

### Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3082405R, Parent Sample ID: 211210A9.3082404R

Run in Batch: 211210A9, Run Date: 12/10/2021 15:51, Prep Date: 12/10/2021, Matrix: WW, Dilution: 10

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		100.7	70.0	130.0	3.2	30.0

### Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3102907N, Parent Sample ID: 211210A9.3102906M

Run in Batch: 211210A9, Run Date: 12/10/2021 14:30, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		106.6	70.0	130.0	14.8	30.0

### Matrix Spike Duplicate (MSD)

Lab Sample ID: 211210A9.3103105N, Parent Sample ID: 211210A9.3103104M

Run in Batch: 211210A9, Run Date: 12/10/2021 15:11, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane	*	142.1	70.0	130.0	0.7	30.0

# QC Report - Batch QC Results

## Organics - Volatiles, Prep Batch ID: VS211210W2

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

### Blank (BLK)

Lab Sample ID: 211210B9.BLKW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 23:29, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

### Laboratory Control Sample (LCS)

Lab Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:28, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		100.6	70.0	130.0

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211210B9.LCSDW10B, Parent Sample ID: 211210B9.LCSW10B

Run in Batch: 211210B9, Run Date: 12/10/2021 22:48, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		98.0	70.0	130.0	2.6	30.0

# QC Report - Batch QC Results

## Organics - Volatiles, Prep Batch ID: VS211214W1

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

### Blank (BLK)

Lab Sample ID: 211214A9.BLKW14A

Run in Batch: 211214A9, Run Date: 12/14/2021 15:49, Prep Date: 12/14/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

### Laboratory Control Sample (LCS)

Lab Sample ID: 211214A9.LCSW14A

Run in Batch: 211214A9, Run Date: 12/14/2021 12:50, Prep Date: 12/14/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		107.1	70.0	130.0

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211214A9.LCSDW14A, Parent Sample ID: 211214A9.LCSW14A

Run in Batch: 211214A9, Run Date: 12/14/2021 13:10, Prep Date: 12/14/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		106.4	70.0	130.0	0.6	30.0

# Merit Laboratories Login Checklist

Lab Set ID:S30824

Attention: Kaitlyn Hunt

Address: Arcadis  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04700 / RACER Lansing (Plant 2)

Submitted: 12/02/2021 08:15 Login User: JRM

Phone: O:248-809-4013 FAX:

Email: Kaitlyn.Hunt@arcadis.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out MS/MSD not listed
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: \_\_\_\_\_



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 141450

*Plant 2*

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Kaitlyn Hunt  
 COMPANY Arcadis  
 ADDRESS 28550 Cabot Dr Suite 500  
 CITY Novi STATE MI ZIP CODE 48377  
 PHONE NO. 947-777-5215 FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS Kaitlyn.Hunt@arcadis.com QUOTE NO. \_\_\_\_\_

CONTACT NAME SAME  
 COMPANY \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. \_\_\_\_\_ E-MAIL ADDRESS \_\_\_\_\_

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME 30075941.04700/RACER Lansing (Plant 2) SAMPLER(S) - PLEASE PRINT/SIGN NAME Donald Richmond / D. Deim  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other MI  
 Special Instructions \_\_\_\_\_

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

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	VOCs 1,4 Dioxane							
	DATE	TIME																		
30824.01	12/1/21	1010	MW-15-72-120121	GW	3	X	X	X	X	X	X	X	X							
.02	12/1/21	1205	MW-20-130-120121	GW	3	X	X	X	X	X	X	X	X							
.03/.04/.05	12/1/21	1325	MW-16-81-120121	GW	9	X	X	X	X	X	X	X	X							
.06	12/1/21	1530	MW-14-56-120121	GW	3	X	X	X	X	X	X	X	X							
.07	12/1/21	1035	MW-12-09-120121	GW	3	X	X	X	X	X	X	X	X							
.08	12/1/21	1305	MW-14-58R-120121	GW	3	X	X	X	X	X	X	X	X							
.09	12/1/21	—	DUP-04-120121	GW	3	X	X	X	X	X	X	X	X							
.10	12/1/21	1400	MW-14-59-120121	GW	3	X	X	X	X	X	X	X	X							
.11	12/1/21	1445	MW-14-60-120121	GW	3	X	X	X	X	X	X	X	X							
.12	12/1/21	1540	MW-14-62-120121	GW	3	X	X	X	X	X	X	X	X							
.13	12/1/21	1625	MW-21-139-120121	GW	3	X	X	X	X	X	X	X	X							
—	12/1/21	1010	EB-04-120121	GW	3	X	X	X	X	X	X	X	X							an 12/1/21

RELINQUISHED BY: [Signature]  Sampler DATE 12-1-21 TIME 1720  
 RECEIVED BY: Merit Storage DATE 12-1-21 TIME 1720

RELINQUISHED BY: Merit Fridge DATE 12/2/21 TIME 0815  
 RECEIVED BY: M. Calcutt DATE 12/2/21 TIME 0815  
 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



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C.O.C. PAGE # 2 OF 2

137969

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

*Plant 2*

**INVOICE TO**

CONTACT NAME *Kaitlyn Hunt*  
 COMPANY *Arcadis*  
 ADDRESS *28550 Cabot Drive, Suite 500*  
 CITY *Novi* STATE *MI* ZIP CODE *48377*  
 PHONE NO. *947-777-5215* FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS *Kaitlyn.Hunt@arcadis.com* QUOTE NO. \_\_\_\_\_

CONTACT NAME  SAME  
 COMPANY \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. \_\_\_\_\_ E-MAIL ADDRESS \_\_\_\_\_

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME *3607 5941. 04700/RCER Lansing (Plant 2)* SAMPLER(S) - PLEASE PRINT/SIGN NAME *Austin Westhuis/Am CW*  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

**Certifications**  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
**Project Locations**  
 Detroit  New York  
 Other *MI*  
**Special Instructions**

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

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	VOCs	14-Bio 1,2,6,8-THNS
	DATE	TIME												
<i>30824.14</i>	<i>12/1/21</i>	<i>1545</i>	<i>P2-mw-04-120121</i>	<i>GW</i>	<i>3</i>								<input checked="" type="checkbox"/>	
<i>.15</i>	<i>12/1/21</i>	<i>---</i>	<i>Trip Blank</i>	<i>GW</i>	<i>1</i>								<input checked="" type="checkbox"/>	

RELINQUISHED BY: *[Signature]*  Sampler DATE *12-1-21* TIME *1720*  
 RECEIVED BY: *Merit Storage* DATE *12-1-21* TIME *1720*

RELINQUISHED BY: *Merit Fridge* DATE *12/2/21* TIME *0815*  
 RECEIVED BY: *M. [Signature]* DATE *12/2/21* TIME *0815*  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_ NOTES: TEMP. ON ARRIVAL *4.0*



# Analytical Laboratory Report

Report ID: S30951.01(01)+QC01  
Generated on 12/13/2021

Report to

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

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

Additional Contacts: Alex Villhauer, Marina Samp, Tiffany Linder

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 Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S30951.01-S30951.12  
Project: 30075941.04700 / Racer Lansing  
Collected Date(s): 12/03/2021  
Submitted Date/Time: 12/03/2021 16:30  
Sampled by: DonaldRichmond/J Pisarkiewicz  
P.O. #: 30075941.04700

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- Sample Summary (Page 5)
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Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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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).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

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.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory 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
Wisconsin DNR	FID# 399147320

## 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
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



# Analytical Laboratory Report

## Sample Summary (12 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S30951.01	MW-17-86_120321	Groundwater	12/03/21 10:20
S30951.02	MW-19-115_120321	Groundwater	12/03/21 11:40
S30951.03	MW-19-116_120321	Groundwater	12/03/21 12:50
S30951.04	MW-19-117_120321	Groundwater	12/03/21 14:15
S30951.05	MW-19-120_120321	Groundwater	12/03/21 15:25
S30951.06	Trip Blank	Water	12/03/21 15:50
S30951.07	Dup-02_120321	Groundwater	12/03/21 12:00
S30951.08	MW-19-122_120321	Groundwater	12/03/21 09:30
S30951.09	PW-14-01_120321	Groundwater	12/03/21 10:45
S30951.10	MW-21-140_120321	Groundwater	12/03/21 12:25
S30951.11	MW-16-85_120321	Groundwater	12/03/21 14:00
S30951.12	MW-21-142_120321	Groundwater	12/03/21 15:10



# Analytical Laboratory Report

Lab Sample ID: S30951.01

Sample Tag: MW-17-86\_120321

Collected Date/Time: 12/03/2021 10:20

Matrix: Groundwater

COC Reference: 137874

### 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	12/07/21 10:40	NDK	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 10:58, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	43	1		ug/L	1	123-91-1	

### Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 18:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	



# Analytical Laboratory Report

Lab Sample ID: S30951.01 (continued)

Sample Tag: MW-17-86\_120321

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 18:54, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



# Analytical Laboratory Report

Lab Sample ID: S30951.02

Sample Tag: MW-19-115\_120321

Collected Date/Time: 12/03/2021 11:40

Matrix: Groundwater

COC Reference: 137874

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 11:18, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	8	1		ug/L	1	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S30951.03

Sample Tag: MW-19-116\_120321

Collected Date/Time: 12/03/2021 12:50

Matrix: Groundwater

COC Reference: 137874

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 11:38, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	68	1		ug/L	1	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S30951.04

Sample Tag: MW-19-117\_120321

Collected Date/Time: 12/03/2021 14:15

Matrix: Groundwater

COC Reference: 137874

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 11:58, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	1	1		ug/L	1	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S30951.05

Sample Tag: MW-19-120\_120321

Collected Date/Time: 12/03/2021 15:25

Matrix: Groundwater

COC Reference: 137874

### 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	12/07/21 10:40	NDK	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 12:18, 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: 12/06/21 19:13, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	



# Analytical Laboratory Report

Lab Sample ID: S30951.05 (continued)

Sample Tag: MW-19-120\_120321

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 19:13, Analyst: KAG (continued)**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



# Analytical Laboratory Report

Lab Sample ID: S30951.06

Sample Tag: Trip Blank

Collected Date/Time: 12/03/2021 15:50

Matrix: Water

COC Reference: 137874

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	4.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	12/07/21 10:40	NDK	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/07/21 23:15, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



# Analytical Laboratory Report

Lab Sample ID: S30951.06 (continued)

Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/07/21 23:15, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



# Analytical Laboratory Report

Lab Sample ID: S30951.07

Sample Tag: Dup-02\_120321

Collected Date/Time: 12/03/2021 12:00

Matrix: Groundwater

COC Reference: 137874

## 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	12/13/21 12:30	BML	

## Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 12:38, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	73	1		ug/L	1	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S30951.08

Sample Tag: MW-19-122\_120321

Collected Date/Time: 12/03/2021 09:30

Matrix: Groundwater

COC Reference: 140971

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 12:58, 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: S30951.09

Sample Tag: PW-14-01\_120321

Collected Date/Time: 12/03/2021 10:45

Matrix: Groundwater

COC Reference: 140971

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 13:19, Analyst: JGH

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: S30951.10

Sample Tag: MW-21-140\_120321

Collected Date/Time: 12/03/2021 12:25

Matrix: Groundwater

COC Reference: 140971

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 13:40, 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: S30951.11

Sample Tag: MW-16-85\_120321

Collected Date/Time: 12/03/2021 14:00

Matrix: Groundwater

COC Reference: 140971

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	12/13/21 12:30	BML	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 14:00, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	10	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 19:33, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	



# Analytical Laboratory Report

Lab Sample ID: S30951.11 (continued)

Sample Tag: MW-16-85\_120321

**Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 12/06/21 19:33, Analyst: KAG (continued)**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



# Analytical Laboratory Report

Lab Sample ID: S30951.12

Sample Tag: MW-21-142\_120321

Collected Date/Time: 12/03/2021 15:10

Matrix: Groundwater

COC Reference: 140971

### 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	12/13/21 12:30	BML	

### Organics - Volatiles

Method: SW8260B - SIM, Run Date: 12/11/21 14:21, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	91	1		ug/L	1	123-91-1	



# Quality Control Report

Report ID: S30951.01(01)+QC01  
Generated on 12/13/2021

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

Report Produced by  
Merit Laboratories  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333

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

## Report Summary

Lab Sample ID(s): S30951.01-S30951.12  
Project: 30075941.04700 / Racer Lansing  
Submitted Date/Time: 12/03/2021 16:30  
Sampled by: DonaldRichmond/J Pisarkiewicz  
P.O. #: 30075941.04700

## QC Report Sections

Cover Page (Page 22)  
Analysis Summary (Pages 23-34)  
Prep Batch Summary (Page 35)  
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Surrogates per QC Sample (Pages 40-43)  
Internal Standards per Lab Sample (Pages 44-55)  
Internal Standards per QC Sample (Pages 56-59)  
Batch QC Results (Pages 60-74)

## 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: S30951.01

Sample Tag: MW-17-86\_120321

Collected Date/Time: 12/03/2021 10:20

Matrix: Groundwater

COC Reference: 137874

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr QC Types
<b>Organics - Volatiles</b>					
1,4-Dioxane	SW8260B - SIM	12/11/21 10:58	211210C9	VS211210W3	Yes BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 18:54	211206A9	VF211206W2	Yes BLK/LCS/LCSD/MS/MS

# QC Report - Analysis Summary

Lab Sample ID: S30951.02

Sample Tag: MW-19-115\_120321

Collected Date/Time: 12/03/2021 11:40

Matrix: Groundwater

COC Reference: 137874

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 11:18	211210C9	VS211210W3	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

**Lab Sample ID: S30951.03**

Sample Tag: MW-19-116\_120321

Collected Date/Time: 12/03/2021 12:50

Matrix: Groundwater

COC Reference: 137874

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 11:38	211210C9	VS211210W3	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30951.04

Sample Tag: MW-19-117\_120321

Collected Date/Time: 12/03/2021 14:15

Matrix: Groundwater

COC Reference: 137874

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 11:58	211210C9	VS211210W3	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30951.05

Sample Tag: MW-19-120\_120321

Collected Date/Time: 12/03/2021 15:25

Matrix: Groundwater

COC Reference: 137874

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 12:18	211210C9	VS211210W3	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 19:13	211206A9	VF211206W2	Yes	BLK/LCS/LCSD/MS/MS

# QC Report - Analysis Summary

**Lab Sample ID: S30951.06**

Sample Tag: Trip Blank

Collected Date/Time: 12/03/2021 15:50

Matrix: Water

COC Reference: 137874

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
Volatile Organics - DEQ List	SW5030C/8260C	12/07/21 23:15	211207B9	VF211207W4	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30951.07

Sample Tag: Dup-02\_120321

Collected Date/Time: 12/03/2021 12:00

Matrix: Groundwater

COC Reference: 137874

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 12:38	211210C9	VS211210W3	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

**Lab Sample ID: S30951.08**

Sample Tag: MW-19-122\_120321

Collected Date/Time: 12/03/2021 09:30

Matrix: Groundwater

COC Reference: 140971

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 12:58	211210C9	VS211210W3	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30951.09

Sample Tag: PW-14-01\_120321

Collected Date/Time: 12/03/2021 10:45

Matrix: Groundwater

COC Reference: 140971

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 13:19	211210C9	VS211210W3	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

**Lab Sample ID: S30951.10**

Sample Tag: MW-21-140\_120321

Collected Date/Time: 12/03/2021 12:25

Matrix: Groundwater

COC Reference: 140971

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 13:40	211210C9	VS211210W3	Yes	BLK/LCS/LCSD

# QC Report - Analysis Summary

Lab Sample ID: S30951.11

Sample Tag: MW-16-85\_120321

Collected Date/Time: 12/03/2021 14:00

Matrix: Groundwater

COC Reference: 140971

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr QC Types
<b>Organics - Volatiles</b>					
1,4-Dioxane	SW8260B - SIM	12/11/21 14:00	211210C9	VS211210W3	Yes BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 19:33	211206A9	VF211206W2	Yes BLK/LCS/LCSD/MS/MS

# QC Report - Analysis Summary

Lab Sample ID: S30951.12

Sample Tag: MW-21-142\_120321

Collected Date/Time: 12/03/2021 15:10

Matrix: Groundwater

COC Reference: 140971

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Organics - Volatiles</b>						
1,4-Dioxane	SW8260B - SIM	12/11/21 14:21	211210C9	VS211210W3	Yes	BLK/LCS/LCSD

## QC Report - Prep Batch Summary

### Organics - Volatiles, Prep Batch ID: VF211206W2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S30951.01	Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 18:54	211206A9
S30951.05	Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 19:13	211206A9
S30951.11	Volatile Organics - DEQ List	SW5030C/8260C	12/06/21 19:33	211206A9

### Organics - Volatiles, Prep Batch ID: VF211207W4

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S30951.06	Volatile Organics - DEQ List	SW5030C/8260C	12/07/21 23:15	211207B9

### Organics - Volatiles, Prep Batch ID: VS211210W3

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S30951.01	1,4-Dioxane	SW8260B - SIM	12/11/21 10:58	211210C9
S30951.02	1,4-Dioxane	SW8260B - SIM	12/11/21 11:18	211210C9
S30951.03	1,4-Dioxane	SW8260B - SIM	12/11/21 11:38	211210C9
S30951.04	1,4-Dioxane	SW8260B - SIM	12/11/21 11:58	211210C9
S30951.05	1,4-Dioxane	SW8260B - SIM	12/11/21 12:18	211210C9
S30951.07	1,4-Dioxane	SW8260B - SIM	12/11/21 12:38	211210C9
S30951.08	1,4-Dioxane	SW8260B - SIM	12/11/21 12:58	211210C9
S30951.09	1,4-Dioxane	SW8260B - SIM	12/11/21 13:19	211210C9
S30951.10	1,4-Dioxane	SW8260B - SIM	12/11/21 13:40	211210C9
S30951.11	1,4-Dioxane	SW8260B - SIM	12/11/21 14:00	211210C9
S30951.12	1,4-Dioxane	SW8260B - SIM	12/11/21 14:21	211210C9

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30951.01

Sample Tag: MW-17-86\_120321

Collected Date/Time: 12/03/2021 10:20

Matrix: Groundwater

COC Reference: 137874

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 18:54, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		93.5	80.0	124.0
1,2-Dichloroethane-D4		109.3	72.0	125.0
Toluene-D8		101.1	89.0	112.0

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30951.05

Sample Tag: MW-19-120\_120321

Collected Date/Time: 12/03/2021 15:25

Matrix: Groundwater

COC Reference: 137874

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 19:13, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		91.3	80.0	124.0
1,2-Dichloroethane-D4		105.4	72.0	125.0
Toluene-D8		101.4	89.0	112.0

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30951.06

Sample Tag: Trip Blank

Collected Date/Time: 12/03/2021 15:50

Matrix: Water

COC Reference: 137874

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211207B9, Run Date: 12/07/2021 23:15, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		93.1	80.0	124.0
1,2-Dichloroethane-D4		104.4	72.0	125.0
Toluene-D8		100.2	89.0	112.0

# QC Report - Surrogates per Lab Sample

Lab Sample ID: S30951.11

Sample Tag: MW-16-85\_120321

Collected Date/Time: 12/03/2021 14:00

Matrix: Groundwater

COC Reference: 140971

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 19:33, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		<b>92.6</b>	80.0	124.0
1,2-Dichloroethane-D4		<b>106.9</b>	72.0	125.0
Toluene-D8		<b>100.9</b>	89.0	112.0

## QC Report - Surrogates per QC Sample

### Organics - Volatiles, Prep Batch ID: VF211206W2

QC Types: BLK/LCS/LCSD/MS/MSD

#### Blank (BLK)

Lab Sample ID: 211206A9.BLKW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 15:06, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		93.4	80.0	124.0
1,2-Dichloroethane-D4		108.5	72.0	125.0
Toluene-D8		100.5	89.0	112.0

#### Laboratory Control Sample (LCS)

Lab Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:15, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		92.9	80.0	124.0
1,2-Dichloroethane-D4		96.4	72.0	125.0
Toluene-D8		100.0	89.0	112.0

#### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211206A9.LCSDW06A, Parent Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:34, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		94.5	80.0	124.0
1,2-Dichloroethane-D4		103.0	72.0	125.0
Toluene-D8		99.9	89.0	112.0

#### Matrix Spike (MS)

Lab Sample ID: 211206A9.3082404M, Parent Sample ID: S30824.03

Run in Batch: 211206A9, Run Date: 12/06/2021 13:12, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		93.7	80.0	124.0
1,2-Dichloroethane-D4		105.8	72.0	125.0
Toluene-D8		100.6	89.0	112.0

#### Matrix Spike (MS)

Lab Sample ID: 211206A9.3094907M, Parent Sample ID: S30949.04

Run in Batch: 211206A9, Run Date: 12/06/2021 13:50, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		96.3	80.0	124.0
1,2-Dichloroethane-D4		113.6	72.0	125.0
Toluene-D8		102.2	89.0	112.0

# QC Report - Surrogates per QC Sample

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211206A9.3082405N, Parent Sample ID: 211206A9.3082404M

Run in Batch: 211206A9, Run Date: 12/06/2021 13:31, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		<b>91.3</b>	80.0	124.0
1,2-Dichloroethane-D4		<b>110.3</b>	72.0	125.0
Toluene-D8	*	<b>87.2</b>	89.0	112.0

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211206A9.3094908N, Parent Sample ID: 211206A9.3094907M

Run in Batch: 211206A9, Run Date: 12/06/2021 14:09, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		<b>94.5</b>	80.0	124.0
1,2-Dichloroethane-D4		<b>110.5</b>	72.0	125.0
Toluene-D8		<b>101.6</b>	89.0	112.0

# QC Report - Surrogates per QC Sample

## Organics - Volatiles, Prep Batch ID: VF211207W4

QC Types: BLK/LCS/LCSD

### Blank (BLK)

Lab Sample ID: 211207B9.BLKW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 22:56, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		92.1	80.0	124.0
1,2-Dichloroethane-D4		103.9	72.0	125.0
Toluene-D8		101.2	89.0	112.0

### Laboratory Control Sample (LCS)

Lab Sample ID: 211207B9.LCSW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 21:40, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		92.7	80.0	124.0
1,2-Dichloroethane-D4		98.9	72.0	125.0
Toluene-D8		104.5	89.0	112.0

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211207B9.LCSDW07A, Parent Sample ID: 211207B9.LCSW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 21:59, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		94.9	80.0	124.0
1,2-Dichloroethane-D4		102.7	72.0	125.0
Toluene-D8		101.7	89.0	112.0

# QC Report - Surrogates per QC Sample

## Organics - Volatiles, Prep Batch ID: VS211210W3

QC Types: BLK/LCS/LCSD

### Blank (BLK)

Lab Sample ID: 211210C9.BLKW10C

Run in Batch: 211210C9, Run Date: 12/11/2021 09:16, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Laboratory Control Sample (LCS)

Lab Sample ID: 211210C9.LCSW10C

Run in Batch: 211210C9, Run Date: 12/11/2021 08:15, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211210C9.LCSDW10C, Parent Sample ID: 211210C9.LCSW10C

Run in Batch: 211210C9, Run Date: 12/11/2021 08:35, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.01

Sample Tag: MW-17-86\_120321

Collected Date/Time: 12/03/2021 10:20

Matrix: Groundwater

COC Reference: 137874

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210C9, Run Date: 12/11/2021 10:58, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		101.3	50.0	200.0
1,4-Dioxane-D8		84.5	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		79.2	50.0	200.0

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 18:54, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		90.5	50.0	200.0
1,4-Difluorobenzene		93.8	50.0	200.0
Chlorobenzene-D5		96.3	50.0	200.0
1,4-Dichlorobenzene-D4		97.1	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.02

Sample Tag: MW-19-115\_120321

Collected Date/Time: 12/03/2021 11:40

Matrix: Groundwater

COC Reference: 137874

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210C9, Run Date: 12/11/2021 11:18, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>102.6</b>	50.0	200.0
1,4-Dioxane-D8		<b>88.9</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>81.2</b>	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.03

Sample Tag: MW-19-116\_120321

Collected Date/Time: 12/03/2021 12:50

Matrix: Groundwater

COC Reference: 137874

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210C9, Run Date: 12/11/2021 11:38, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		101.6	50.0	200.0
1,4-Dioxane-D8		89.8	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		80.7	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.04

Sample Tag: MW-19-117\_120321

Collected Date/Time: 12/03/2021 14:15

Matrix: Groundwater

COC Reference: 137874

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210C9, Run Date: 12/11/2021 11:58, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		101.8	50.0	200.0
1,4-Dioxane-D8		81.4	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		78.6	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.05

Sample Tag: MW-19-120\_120321

Collected Date/Time: 12/03/2021 15:25

Matrix: Groundwater

COC Reference: 137874

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210C9, Run Date: 12/11/2021 12:18, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		102.2	50.0	200.0
1,4-Dioxane-D8		92.7	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		83.1	50.0	200.0

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 19:13, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		94.0	50.0	200.0
1,4-Difluorobenzene		96.4	50.0	200.0
Chlorobenzene-D5		98.7	50.0	200.0
1,4-Dichlorobenzene-D4		98.1	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.06

Sample Tag: Trip Blank

Collected Date/Time: 12/03/2021 15:50

Matrix: Water

COC Reference: 137874

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211207B9, Run Date: 12/07/2021 23:15, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		99.0	50.0	200.0
1,4-Difluorobenzene		101.3	50.0	200.0
Chlorobenzene-D5		102.8	50.0	200.0
1,4-Dichlorobenzene-D4		103.4	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.07

Sample Tag: Dup-02\_120321

Collected Date/Time: 12/03/2021 12:00

Matrix: Groundwater

COC Reference: 137874

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210C9, Run Date: 12/11/2021 12:38, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		116.1	50.0	200.0
1,4-Dioxane-D8		84.0	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		111.0	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.08

Sample Tag: MW-19-122\_120321

Collected Date/Time: 12/03/2021 09:30

Matrix: Groundwater

COC Reference: 140971

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210C9, Run Date: 12/11/2021 12:58, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		102.4	50.0	200.0
1,4-Dioxane-D8		88.1	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		82.7	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.09

Sample Tag: PW-14-01\_120321

Collected Date/Time: 12/03/2021 10:45

Matrix: Groundwater

COC Reference: 140971

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210C9, Run Date: 12/11/2021 13:19, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		103.9	50.0	200.0
1,4-Dioxane-D8		90.0	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		98.6	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.10

Sample Tag: MW-21-140\_120321

Collected Date/Time: 12/03/2021 12:25

Matrix: Groundwater

COC Reference: 140971

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210C9, Run Date: 12/11/2021 13:40, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		98.8	50.0	200.0
1,4-Dioxane-D8		86.9	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		84.9	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.11

Sample Tag: MW-16-85\_120321

Collected Date/Time: 12/03/2021 14:00

Matrix: Groundwater

COC Reference: 140971

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210C9, Run Date: 12/11/2021 14:00, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		101.0	50.0	200.0
1,4-Dioxane-D8		90.3	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		82.8	50.0	200.0

## Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 211206A9, Run Date: 12/06/2021 19:33, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		95.4	50.0	200.0
1,4-Difluorobenzene		99.6	50.0	200.0
Chlorobenzene-D5		102.4	50.0	200.0
1,4-Dichlorobenzene-D4		116.5	50.0	200.0

# QC Report - Internal Standards per Lab Sample

Lab Sample ID: S30951.12

Sample Tag: MW-21-142\_120321

Collected Date/Time: 12/03/2021 15:10

Matrix: Groundwater

COC Reference: 140971

## Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 211210C9, Run Date: 12/11/2021 14:21, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		101.3	50.0	200.0
1,4-Dioxane-D8		87.9	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		79.8	50.0	200.0

**QC Report - Internal Standards per QC Sample**

**Organics - Volatiles, Prep Batch ID: VF211206W2**

QC Types: BLK/LCS/LCSD/MS/MSD

**Blank (BLK)**

Lab Sample ID: 211206A9.BLKW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 15:06, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>90.2</b>	50.0	200.0
1,4-Difluorobenzene		<b>95.3</b>	50.0	200.0
Chlorobenzene-D5		<b>96.8</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>96.7</b>	50.0	200.0

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:15, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>96.0</b>	50.0	200.0
1,4-Difluorobenzene		<b>96.2</b>	50.0	200.0
Chlorobenzene-D5		<b>94.6</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>92.3</b>	50.0	200.0

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211206A9.LCSDW06A, Parent Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:34, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>95.2</b>	50.0	200.0
1,4-Difluorobenzene		<b>95.9</b>	50.0	200.0
Chlorobenzene-D5		<b>94.7</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>95.0</b>	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211206A9.3082404M, Parent Sample ID: S30824.03

Run in Batch: 211206A9, Run Date: 12/06/2021 13:12, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>93.7</b>	50.0	200.0
1,4-Difluorobenzene		<b>96.8</b>	50.0	200.0
Chlorobenzene-D5		<b>97.7</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>97.1</b>	50.0	200.0

**Matrix Spike (MS)**

Lab Sample ID: 211206A9.3094907M, Parent Sample ID: S30949.04

Run in Batch: 211206A9, Run Date: 12/06/2021 13:50, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>91.6</b>	50.0	200.0
1,4-Difluorobenzene		<b>95.5</b>	50.0	200.0
Chlorobenzene-D5		<b>99.1</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>102.6</b>	50.0	200.0

# QC Report - Internal Standards per QC Sample

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211206A9.3082405N, Parent Sample ID: 211206A9.3082404M

Run in Batch: 211206A9, Run Date: 12/06/2021 13:31, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>113.1</b>	50.0	200.0
1,4-Difluorobenzene		<b>111.7</b>	50.0	200.0
Chlorobenzene-D5		<b>101.8</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>112.9</b>	50.0	200.0

## Matrix Spike Duplicate (MSD)

Lab Sample ID: 211206A9.3094908N, Parent Sample ID: 211206A9.3094907M

Run in Batch: 211206A9, Run Date: 12/06/2021 14:09, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		<b>89.2</b>	50.0	200.0
1,4-Difluorobenzene		<b>93.5</b>	50.0	200.0
Chlorobenzene-D5		<b>96.1</b>	50.0	200.0
1,4-Dichlorobenzene-D4		<b>96.7</b>	50.0	200.0

# QC Report - Internal Standards per QC Sample

## Organics - Volatiles, Prep Batch ID: VF211207W4

QC Types: BLK/LCS/LCSD

### Blank (BLK)

Lab Sample ID: 211207B9.BLKW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 22:56, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		95.9	50.0	200.0
1,4-Difluorobenzene		97.9	50.0	200.0
Chlorobenzene-D5		100.1	50.0	200.0
1,4-Dichlorobenzene-D4		95.1	50.0	200.0

### Laboratory Control Sample (LCS)

Lab Sample ID: 211207B9.LCSW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 21:40, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		96.9	50.0	200.0
1,4-Difluorobenzene		97.9	50.0	200.0
Chlorobenzene-D5		98.2	50.0	200.0
1,4-Dichlorobenzene-D4		91.9	50.0	200.0

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211207B9.LCSDW07A, Parent Sample ID: 211207B9.LCSW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 21:59, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		97.8	50.0	200.0
1,4-Difluorobenzene		97.7	50.0	200.0
Chlorobenzene-D5		98.4	50.0	200.0
1,4-Dichlorobenzene-D4		93.9	50.0	200.0

# QC Report - Internal Standards per QC Sample

## Organics - Volatiles, Prep Batch ID: VS211210W3

QC Types: BLK/LCS/LCSD

### Blank (BLK)

Lab Sample ID: 211210C9.BLKW10C

Run in Batch: 211210C9, Run Date: 12/11/2021 09:16, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>121.6</b>	50.0	200.0
1,4-Dioxane-D8		<b>105.3</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>90.7</b>	50.0	200.0

### Laboratory Control Sample (LCS)

Lab Sample ID: 211210C9.LCSW10C

Run in Batch: 211210C9, Run Date: 12/11/2021 08:15, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>96.5</b>	50.0	200.0
1,4-Dioxane-D8		<b>93.4</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>98.6</b>	50.0	200.0

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211210C9.LCSDW10C, Parent Sample ID: 211210C9.LCSW10C

Run in Batch: 211210C9, Run Date: 12/11/2021 08:35, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,2-DIBROMOETHANE-D4 (I)		<b>116.2</b>	50.0	200.0
1,4-Dioxane-D8		<b>109.9</b>	50.0	200.0
1,2-DIBROMO-3-CHLOROPROPANE-C3 (I)		<b>98.2</b>	50.0	200.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2**

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

**Blank (BLK)**

Lab Sample ID: 211206A9.BLKW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 15:06, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acetone		ND	10.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Benzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Bromoform		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Chloroform		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Diethyl ether		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
2-Hexanone		ND	10.00	ug/l
Hexachloroethane		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Methyl iodide		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Blank (BLK) (continued)**

Lab Sample ID: 211206A9.BLKW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 15:06, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Naphthalene		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Toluene		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:15, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acetone		105.1	29.9	161.5
Acrylonitrile		103.4	69.9	128.9
2-Butanone (MEK)		100.4	44.0	134.4
Benzene		98.9	79.9	124.9
n-Butylbenzene		98.3	80.0	133.3
Bromobenzene		92.5	78.7	124.6
Bromochloromethane		97.5	78.2	120.8
Bromodichloromethane		98.8	80.4	128.2
Bromoform		94.1	69.4	128.0
Bromomethane		109.1	56.8	151.3
sec-Butylbenzene		100.7	77.4	129.8
tert-Butylbenzene		93.4	80.7	128.9
Carbon disulfide		95.8	63.8	137.4
Carbon tetrachloride		95.4	72.6	133.0
Chlorobenzene		97.3	79.2	122.7
Chloroethane		109.1	53.4	149.4
Chloroform		98.7	78.4	124.0
Chloromethane		97.6	23.8	166.5
1,1-Dichloroethane		98.8	71.5	126.2
1,1-Dichloroethene		97.9	69.6	139.4

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Laboratory Control Sample (LCS) (continued)**

Lab Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:15, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,2-Dibromo-3-chloropropane		92.9	21.2	189.4
1,2-Dibromoethane		97.5	70.3	133.7
1,2-Dichlorobenzene		94.2	10.0	166.2
1,2-Dichloroethane		96.8	76.0	126.3
1,2-Dichloropropane		99.4	78.6	126.4
1,3-Dichlorobenzene		100.5	77.0	131.3
1,4-Dichlorobenzene		98.7	20.7	137.7
cis-1,2-Dichloroethene		98.5	76.6	122.1
cis-1,3-Dichloropropene		100.6	79.8	129.9
Dibromochloromethane		98.2	74.6	127.2
Dibromomethane		96.2	76.9	122.1
Dichlorodifluoromethane		83.2	10.0	222.8
Diethyl ether		100.1	67.4	121.2
trans-1,2-Dichloroethene		98.1	73.6	129.3
trans-1,3-Dichloropropene		99.7	74.0	131.3
trans-1,4-Dichloro-2-butene		126.3	68.6	135.4
Ethylbenzene		97.9	79.5	129.1
2-Hexanone		102.0	55.4	136.9
Hexachloroethane		97.3	23.8	138.1
p-Isopropyltoluene		105.3	79.8	137.5
Isopropylbenzene		94.6	74.4	121.5
2-Methylnaphthalene		110.3	25.5	165.5
4-Methyl-2-pentanone (MIBK)		99.7	71.6	125.2
tert-Methyl butyl ether (MTBE)		101.3	73.2	122.4
Methyl iodide		99.1	68.8	116.4
Methylene chloride		95.2	73.3	121.1
Naphthalene		85.0	32.9	135.8
n-Propylbenzene		94.0	82.0	130.7
Styrene		96.0	69.5	126.7
1,1,1,2-Tetrachloroethane		99.6	80.3	128.2
1,1,1-Trichloroethane		97.5	79.4	130.9
1,1,2,2-Tetrachloroethane		87.7	79.8	126.3
1,1,2-Trichloroethane		99.0	78.7	123.1
1,2,3-Trichlorobenzene		86.4	75.4	131.4
1,2,3-Trichloropropane		91.6	78.3	138.8
1,2,3-Trimethylbenzene		105.4	76.3	124.2
1,2,4-Trichlorobenzene		85.5	27.4	143.4
1,2,4-Trimethylbenzene		94.8	81.4	130.8
1,3,5-Trimethylbenzene		96.2	81.3	128.9
Tetrachloroethene		94.9	74.5	124.5
Tetrahydrofuran		99.9	59.0	117.9
Toluene		97.1	79.8	124.5
Trichloroethene		98.7	79.7	124.2
Trichlorofluoromethane		97.4	59.7	151.8
Vinyl chloride		100.1	43.5	149.1
o-Xylene		94.8	80.2	131.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Laboratory Control Sample (LCS) (continued)**

Lab Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:15, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
p,m-Xylene		98.1	79.4	132.2

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211206A9.LCSDW06A, Parent Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:34, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acetone		107.6	29.9	161.5	2.4	30.0
Acrylonitrile		106.2	69.9	128.9	2.7	30.0
2-Butanone (MEK)		106.8	44.0	134.4	6.2	30.0
Benzene		96.4	79.9	124.9	2.5	30.0
n-Butylbenzene		92.9	80.0	133.3	5.6	30.0
Bromobenzene		92.7	78.7	124.6	0.2	30.0
Bromochloromethane		98.1	78.2	120.8	0.7	30.0
Bromodichloromethane		98.7	80.4	128.2	0.1	30.0
Bromoform		95.2	69.4	128.0	1.2	30.0
Bromomethane		106.4	56.8	151.3	2.5	30.0
sec-Butylbenzene		96.5	77.4	129.8	4.2	30.0
tert-Butylbenzene		93.2	80.7	128.9	0.3	30.0
Carbon disulfide		91.3	63.8	137.4	4.9	30.0
Carbon tetrachloride		92.1	72.6	133.0	3.5	30.0
Chlorobenzene		94.7	79.2	122.7	2.7	30.0
Chloroethane		107.5	53.4	149.4	1.5	30.0
Chloroform		96.1	78.4	124.0	2.7	30.0
Chloromethane		102.0	23.8	166.5	4.5	30.0
1,1-Dichloroethane		97.8	71.5	126.2	1.1	30.0
1,1-Dichloroethene		92.7	69.6	139.4	5.5	30.0
1,2-Dibromo-3-chloropropane		98.6	21.2	189.4	5.9	30.0
1,2-Dibromoethane		99.9	70.3	133.7	2.5	30.0
1,2-Dichlorobenzene		93.5	10.0	166.2	0.8	30.0
1,2-Dichloroethane		96.3	76.0	126.3	0.5	30.0
1,2-Dichloropropane		97.5	78.6	126.4	1.9	30.0
1,3-Dichlorobenzene		97.9	77.0	131.3	2.6	30.0
1,4-Dichlorobenzene		95.2	20.7	137.7	3.6	30.0
cis-1,2-Dichloroethene		96.1	76.6	122.1	2.5	30.0
cis-1,3-Dichloropropene		99.0	79.8	129.9	1.6	30.0
Dibromochloromethane		100.2	74.6	127.2	2.0	30.0
Dibromomethane		97.0	76.9	122.1	0.9	30.0
Dichlorodifluoromethane		79.9	10.0	222.8	4.1	30.0
Diethyl ether		99.9	67.4	121.2	0.2	30.0
trans-1,2-Dichloroethene		95.4	73.6	129.3	2.8	30.0
trans-1,3-Dichloropropene		102.5	74.0	131.3	2.8	30.0
trans-1,4-Dichloro-2-butene		125.9	68.6	135.4	0.3	30.0
Ethylbenzene		96.8	79.5	129.1	1.1	30.0
2-Hexanone		108.5	55.4	136.9	6.2	30.0
Hexachloroethane		92.8	23.8	138.1	4.7	30.0
p-Isopropyltoluene		100.2	79.8	137.5	5.0	30.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Laboratory Control Sample Duplicate (LCSD) (continued)**

Lab Sample ID: 211206A9.LCSDW06A, Parent Sample ID: 211206A9.LCSW06A

Run in Batch: 211206A9, Run Date: 12/06/2021 12:34, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isopropylbenzene		92.5	74.4	121.5	2.3	30.0
2-Methylnaphthalene		119.3	25.5	165.5	7.9	30.0
4-Methyl-2-pentanone (MIBK)		106.4	71.6	125.2	6.5	30.0
tert-Methyl butyl ether (MTBE)		106.0	73.2	122.4	4.6	30.0
Methyl iodide		96.6	68.8	116.4	2.5	30.0
Methylene chloride		93.7	73.3	121.1	1.6	30.0
Naphthalene		87.6	32.9	135.8	2.9	30.0
n-Propylbenzene		91.1	82.0	130.7	3.0	30.0
Styrene		95.1	69.5	126.7	0.9	30.0
1,1,1,2-Tetrachloroethane		100.8	80.3	128.2	1.2	30.0
1,1,1-Trichloroethane		94.2	79.4	130.9	3.5	30.0
1,1,2,2-Tetrachloroethane		91.3	79.8	126.3	4.1	30.0
1,1,2-Trichloroethane		100.5	78.7	123.1	1.5	30.0
1,2,3-Trichlorobenzene		85.7	75.4	131.4	0.9	30.0
1,2,3-Trichloropropane		95.0	78.3	138.8	3.6	30.0
1,2,3-Trimethylbenzene		100.0	76.3	124.2	5.2	30.0
1,2,4-Trichlorobenzene		83.8	27.4	143.4	1.9	30.0
1,2,4-Trimethylbenzene		103.3	81.4	130.8	8.6	30.0
1,3,5-Trimethylbenzene		93.3	81.3	128.9	3.1	30.0
Tetrachloroethene		92.1	74.5	124.5	3.0	30.0
Tetrahydrofuran		106.0	59.0	117.9	5.9	30.0
Toluene		95.4	79.8	124.5	1.7	30.0
Trichloroethene		94.7	79.7	124.2	4.1	30.0
Trichlorofluoromethane		88.0	59.7	151.8	10.1	30.0
Vinyl chloride		101.1	43.5	149.1	1.0	30.0
o-Xylene		93.4	80.2	131.0	1.5	30.0
p,m-Xylene		100.8	79.4	132.2	2.7	30.0

**Matrix Spike (MS)**

Lab Sample ID: 211206A9.3082404M, Parent Sample ID: S30824.03

Run in Batch: 211206A9, Run Date: 12/06/2021 13:12, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acetone		101.4	29.9	161.5
Acrylonitrile		105.4	69.9	128.9
2-Butanone (MEK)		105.6	44.0	134.4
Benzene		98.0	79.9	124.9
n-Butylbenzene		93.6	80.0	133.3
Bromobenzene		93.4	78.7	124.6
Bromochloromethane		102.5	78.2	120.8
Bromodichloromethane		100.8	80.4	128.2
Bromoform		92.4	69.4	128.0
Bromomethane		98.0	56.8	151.3
sec-Butylbenzene		96.0	77.4	129.8
tert-Butylbenzene		91.2	80.7	128.9
Carbon disulfide		93.4	63.8	137.4
Carbon tetrachloride		95.6	72.6	133.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Matrix Spike (MS) (continued)**

Lab Sample ID: 211206A9.3082404M, Parent Sample ID: S30824.03

Run in Batch: 211206A9, Run Date: 12/06/2021 13:12, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Chlorobenzene		94.8	79.2	122.7
Chloroethane		100.4	53.4	149.4
Chloroform		102.3	78.4	124.0
Chloromethane		100.2	23.8	166.5
1,1-Dichloroethane		102.1	71.5	126.2
1,1-Dichloroethene		98.9	69.6	139.4
1,2-Dibromo-3-chloropropane		102.6	21.2	189.4
1,2-Dibromoethane		96.9	70.3	133.7
1,2-Dichlorobenzene		90.9	10.0	166.2
1,2-Dichloroethane		97.7	76.0	126.3
1,2-Dichloropropane		101.2	78.6	126.4
1,3-Dichlorobenzene		98.1	77.0	131.3
1,4-Dichlorobenzene		96.0	20.7	137.7
cis-1,2-Dichloroethene		102.5	76.6	122.1
cis-1,3-Dichloropropene		100.8	79.8	129.9
Dibromochloromethane		98.0	74.6	127.2
Dibromomethane		99.2	76.9	122.1
Dichlorodifluoromethane		89.7	10.0	222.8
Diethyl ether		104.1	67.4	121.2
trans-1,2-Dichloroethene		100.7	73.6	129.3
trans-1,3-Dichloropropene		101.0	74.0	131.3
trans-1,4-Dichloro-2-butene		120.1	68.6	135.4
Ethylbenzene		95.3	79.5	129.1
2-Hexanone		99.6	55.4	136.9
Hexachloroethane		92.3	23.8	138.1
p-Isopropyltoluene		100.4	79.8	137.5
Isopropylbenzene		91.3	74.4	121.5
2-Methylnaphthalene		80.7	25.5	165.5
4-Methyl-2-pentanone (MIBK)		101.9	71.6	125.2
tert-Methyl butyl ether (MTBE)		107.4	73.2	122.4
Methyl iodide		101.6	68.8	116.4
Methylene chloride		98.3	73.3	121.1
Naphthalene		106.7	32.9	135.8
n-Propylbenzene		91.5	82.0	130.7
Styrene		94.3	69.5	126.7
1,1,1,2-Tetrachloroethane		99.1	80.3	128.2
1,1,1-Trichloroethane		100.1	79.4	130.9
1,1,2,2-Tetrachloroethane		87.5	79.8	126.3
1,1,2-Trichloroethane		100.2	78.7	123.1
1,2,3-Trichlorobenzene		96.4	75.4	131.4
1,2,3-Trichloropropane		90.7	78.3	138.8
1,2,3-Trimethylbenzene		100.8	76.3	124.2
1,2,4-Trichlorobenzene		108.1	27.4	143.4
1,2,4-Trimethylbenzene		91.8	81.4	130.8
1,3,5-Trimethylbenzene		93.0	81.3	128.9
Tetrachloroethene		93.6	74.5	124.5

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Matrix Spike (MS) (continued)**

Lab Sample ID: 211206A9.3082404M, Parent Sample ID: S30824.03

Run in Batch: 211206A9, Run Date: 12/06/2021 13:12, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Tetrahydrofuran		102.6	59.0	117.9
Toluene		97.1	79.8	124.5
Trichloroethene		98.3	79.7	124.2
Trichlorofluoromethane		99.3	59.7	151.8
Vinyl chloride		95.4	43.5	149.1
o-Xylene		94.1	80.2	131.0
p,m-Xylene		95.5	79.4	132.2

**Matrix Spike (MS)**

Lab Sample ID: 211206A9.3094907M, Parent Sample ID: S30949.04

Run in Batch: 211206A9, Run Date: 12/06/2021 13:50, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Benzene		99.6	79.9	124.9
Ethylbenzene		94.6	79.5	129.1
tert-Methyl butyl ether (MTBE)		117.5	73.2	122.4
1,2,4-Trimethylbenzene		92.2	81.4	130.8
1,3,5-Trimethylbenzene		92.6	81.3	128.9
Toluene		98.9	79.8	124.5
o-Xylene		92.7	80.2	131.0
p,m-Xylene		94.3	79.4	132.2

**Matrix Spike Duplicate (MSD)**

Lab Sample ID: 211206A9.3082405N, Parent Sample ID: 211206A9.3082404M

Run in Batch: 211206A9, Run Date: 12/06/2021 13:31, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acetone	*	148.3	29.9	161.5	37.4	30.0
Acrylonitrile	*	152.7	69.9	128.9	36.7	30.0
2-Butanone (MEK)	*	137.1	44.0	134.4	25.9	30.0
Benzene		100.8	79.9	124.9	2.8	30.0
n-Butylbenzene	*	79.1	80.0	133.3	16.8	30.0
Bromobenzene		88.6	78.7	124.6	5.2	30.0
Bromochloromethane		117.7	78.2	120.8	13.8	30.0
Bromodichloromethane		84.7	80.4	128.2	17.3	30.0
Bromoform		90.1	69.4	128.0	2.6	30.0
Bromomethane		86.8	56.8	151.3	12.1	30.0
sec-Butylbenzene		94.6	77.4	129.8	1.5	30.0
tert-Butylbenzene		98.2	80.7	128.9	7.3	30.0
Carbon disulfide		118.5	63.8	137.4	23.6	30.0
Carbon tetrachloride		91.6	72.6	133.0	4.2	30.0
Chlorobenzene		91.2	79.2	122.7	3.9	30.0
Chloroethane		91.2	53.4	149.4	9.6	30.0
Chloroform		115.9	78.4	124.0	12.4	30.0
Chloromethane		84.8	23.8	166.5	16.7	30.0
1,1-Dichloroethane	*	131.7	71.5	126.2	25.4	30.0
1,1-Dichloroethene		122.9	69.6	139.4	21.7	30.0
1,2-Dibromo-3-chloropropane		83.3	21.2	189.4	20.8	30.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)**

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

**Matrix Spike Duplicate (MSD) (continued)**

Lab Sample ID: 211206A9.3082405N, Parent Sample ID: 211206A9.3082404M

Run in Batch: 211206A9, Run Date: 12/06/2021 13:31, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,2-Dibromoethane		95.3	70.3	133.7	1.7	30.0
1,2-Dichlorobenzene		77.8	10.0	166.2	15.4	30.0
1,2-Dichloroethane		96.4	76.0	126.3	1.3	30.0
1,2-Dichloropropane		85.5	78.6	126.4	16.9	30.0
1,3-Dichlorobenzene		91.6	77.0	131.3	6.9	30.0
1,4-Dichlorobenzene		98.3	20.7	137.7	2.4	30.0
cis-1,2-Dichloroethene	*	124.1	76.6	122.1	19.1	30.0
cis-1,3-Dichloropropene		86.5	79.8	129.9	15.2	30.0
Dibromochloromethane		93.6	74.6	127.2	4.6	30.0
Dibromomethane		84.8	76.9	122.1	15.6	30.0
Dichlorodifluoromethane	*	64.4	10.0	222.8	32.8	30.0
Diethyl ether	*	143.0	67.4	121.2	31.5	30.0
trans-1,2-Dichloroethene		127.5	73.6	129.3	23.5	30.0
trans-1,3-Dichloropropene		87.4	74.0	131.3	14.4	30.0
trans-1,4-Dichloro-2-butene		127.8	68.6	135.4	6.3	30.0
Ethylbenzene		90.0	79.5	129.1	5.8	30.0
2-Hexanone		94.4	55.4	136.9	5.3	30.0
Hexachloroethane		78.5	23.8	138.1	16.3	30.0
p-Isopropyltoluene		93.7	79.8	137.5	6.8	30.0
Isopropylbenzene		87.0	74.4	121.5	4.9	30.0
2-Methylnaphthalene		77.4	25.5	165.5	4.1	30.0
4-Methyl-2-pentanone (MIBK)		92.5	71.6	125.2	9.7	30.0
tert-Methyl butyl ether (MTBE)	*	135.4	73.2	122.4	23.0	30.0
Methyl iodide	*	118.4	68.8	116.4	15.2	30.0
Methylene chloride	*	126.3	73.3	121.1	25.0	30.0
Naphthalene	*	73.3	32.9	135.8	37.0	30.0
n-Propylbenzene		85.2	82.0	130.7	7.1	30.0
Styrene		88.7	69.5	126.7	6.1	30.0
1,1,1,2-Tetrachloroethane		93.8	80.3	128.2	5.5	30.0
1,1,1-Trichloroethane		96.0	79.4	130.9	4.1	30.0
1,1,2,2-Tetrachloroethane		87.5	79.8	126.3	0.0	30.0
1,1,2-Trichloroethane		87.9	78.7	123.1	13.1	30.0
1,2,3-Trichlorobenzene	*	72.0	75.4	131.4	29.0	30.0
1,2,3-Trichloropropane		94.4	78.3	138.8	4.0	30.0
1,2,3-Trimethylbenzene		98.5	76.3	124.2	2.3	30.0
1,2,4-Trichlorobenzene	*	71.3	27.4	143.4	41.0	30.0
1,2,4-Trimethylbenzene		103.8	81.4	130.8	12.3	30.0
1,3,5-Trimethylbenzene		89.0	81.3	128.9	4.4	30.0
Tetrachloroethene		79.6	74.5	124.5	16.2	30.0
Tetrahydrofuran	*	136.8	59.0	117.9	28.6	30.0
Toluene		81.6	79.8	124.5	17.4	30.0
Trichloroethene		81.4	79.7	124.2	18.9	30.0
Trichlorofluoromethane		86.5	59.7	151.8	13.8	30.0
Vinyl chloride		83.5	43.5	149.1	13.3	30.0
o-Xylene		87.8	80.2	131.0	6.9	30.0
p,m-Xylene		88.7	79.4	132.2	7.4	30.0

# QC Report - Batch QC Results

## Organics - Volatiles, Prep Batch ID: VF211206W2 (continued)

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

### Matrix Spike Duplicate (MSD)

Lab Sample ID: 211206A9.3094908N, Parent Sample ID: 211206A9.3094907M

Run in Batch: 211206A9, Run Date: 12/06/2021 14:09, Prep Date: 12/06/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Benzene		98.3	79.9	124.9	1.3	30.0
Ethylbenzene		94.2	79.5	129.1	0.5	30.0
tert-Methyl butyl ether (MTBE)		113.7	73.2	122.4	3.3	30.0
1,2,4-Trimethylbenzene		91.3	81.4	130.8	0.9	30.0
1,3,5-Trimethylbenzene		92.4	81.3	128.9	0.2	30.0
Toluene		98.0	79.8	124.5	0.9	30.0
o-Xylene		93.5	80.2	131.0	0.8	30.0
p,m-Xylene		93.9	79.4	132.2	0.4	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF211207W4

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

Blank (BLK)

Lab Sample ID: 211207B9.BLKW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 22:56, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acetone		ND	10.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Benzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Bromoform		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Chloroform		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Diethyl ether		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
2-Hexanone		ND	10.00	ug/l
Hexachloroethane		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Methyl iodide		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211207W4 (continued)**

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

**Blank (BLK) (continued)**

Lab Sample ID: 211207B9.BLKW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 22:56, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Naphthalene		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Toluene		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l

**Laboratory Control Sample (LCS)**

Lab Sample ID: 211207B9.LCSW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 21:40, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acetone		105.9	29.9	161.5
Acrylonitrile		103.9	69.9	128.9
2-Butanone (MEK)		102.0	44.0	134.4
Benzene		100.4	79.9	124.9
n-Butylbenzene		90.9	80.0	133.3
Bromobenzene		93.7	78.7	124.6
Bromochloromethane		103.8	78.2	120.8
Bromodichloromethane		102.3	80.4	128.2
Bromoform		92.0	69.4	128.0
Bromomethane		111.1	56.8	151.3
sec-Butylbenzene		99.8	77.4	129.8
tert-Butylbenzene		91.4	80.7	128.9
Carbon disulfide		92.3	63.8	137.4
Carbon tetrachloride		92.0	72.6	133.0
Chlorobenzene		96.2	79.2	122.7
Chloroethane		111.5	53.4	149.4
Chloroform		102.1	78.4	124.0
Chloromethane		106.9	23.8	166.5
1,1-Dichloroethane		102.3	71.5	126.2
1,1-Dichloroethene		94.2	69.6	139.4

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211207W4 (continued)**

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

**Laboratory Control Sample (LCS) (continued)**

Lab Sample ID: 211207B9.LCSW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 21:40, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,2-Dibromo-3-chloropropane		90.6	21.2	189.4
1,2-Dibromoethane		105.8	70.3	133.7
1,2-Dichlorobenzene		93.6	10.0	166.2
1,2-Dichloroethane		99.3	76.0	126.3
1,2-Dichloropropane		104.0	78.6	126.4
1,3-Dichlorobenzene		100.1	77.0	131.3
1,4-Dichlorobenzene		97.6	20.7	137.7
cis-1,2-Dichloroethene		102.0	76.6	122.1
cis-1,3-Dichloropropene		101.0	79.8	129.9
Dibromochloromethane		102.7	74.6	127.2
Dibromomethane		100.3	76.9	122.1
Dichlorodifluoromethane		80.1	10.0	222.8
Diethyl ether		105.7	67.4	121.2
trans-1,2-Dichloroethene		98.5	73.6	129.3
trans-1,3-Dichloropropene		103.8	74.0	131.3
trans-1,4-Dichloro-2-butene		113.5	68.6	135.4
Ethylbenzene		99.1	79.5	129.1
2-Hexanone		111.1	55.4	136.9
Hexachloroethane		95.9	23.8	138.1
p-Isopropyltoluene		101.5	79.8	137.5
Isopropylbenzene		90.9	74.4	121.5
2-Methylnaphthalene		88.9	25.5	165.5
4-Methyl-2-pentanone (MIBK)		101.9	71.6	125.2
tert-Methyl butyl ether (MTBE)		106.3	73.2	122.4
Methyl iodide		102.1	68.8	116.4
Methylene chloride		99.1	73.3	121.1
Naphthalene		84.9	32.9	135.8
n-Propylbenzene		91.2	82.0	130.7
Styrene		98.2	69.5	126.7
1,1,1,2-Tetrachloroethane		102.2	80.3	128.2
1,1,1-Trichloroethane		96.3	79.4	130.9
1,1,2,2-Tetrachloroethane		88.7	79.8	126.3
1,1,2-Trichloroethane		110.2	78.7	123.1
1,2,3-Trichlorobenzene		85.5	75.4	131.4
1,2,3-Trichloropropane		90.2	78.3	138.8
1,2,3-Trimethylbenzene		103.5	76.3	124.2
1,2,4-Trichlorobenzene		85.2	27.4	143.4
1,2,4-Trimethylbenzene		93.3	81.4	130.8
1,3,5-Trimethylbenzene		97.4	81.3	128.9
Tetrachloroethene		96.4	74.5	124.5
Tetrahydrofuran		101.4	59.0	117.9
Toluene		104.1	79.8	124.5
Trichloroethene		98.8	79.7	124.2
Trichlorofluoromethane		101.4	59.7	151.8
Vinyl chloride		107.7	43.5	149.1
o-Xylene		97.5	80.2	131.0

**QC Report - Batch QC Results**

**Organics - Volatiles, Prep Batch ID: VF211207W4 (continued)**

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

**Laboratory Control Sample (LCS) (continued)**

Lab Sample ID: 211207B9.LCSW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 21:40, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
p,m-Xylene		99.6	79.4	132.2

**Laboratory Control Sample Duplicate (LCSD)**

Lab Sample ID: 211207B9.LCSDW07A, Parent Sample ID: 211207B9.LCSW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 21:59, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acetone		107.8	29.9	161.5	1.7	30.0
Acrylonitrile		105.1	69.9	128.9	1.1	30.0
2-Butanone (MEK)		102.6	44.0	134.4	0.5	30.0
Benzene		96.3	79.9	124.9	4.2	30.0
n-Butylbenzene		87.0	80.0	133.3	4.5	30.0
Bromobenzene		89.6	78.7	124.6	4.4	30.0
Bromochloromethane		99.4	78.2	120.8	4.3	30.0
Bromodichloromethane		97.9	80.4	128.2	4.5	30.0
Bromoform		91.2	69.4	128.0	0.9	30.0
Bromomethane		100.6	56.8	151.3	9.9	30.0
sec-Butylbenzene		92.3	77.4	129.8	7.8	30.0
tert-Butylbenzene		88.3	80.7	128.9	3.5	30.0
Carbon disulfide		85.1	63.8	137.4	8.1	30.0
Carbon tetrachloride		87.2	72.6	133.0	5.4	30.0
Chlorobenzene		92.2	79.2	122.7	4.3	30.0
Chloroethane		97.4	53.4	149.4	13.5	30.0
Chloroform		97.4	78.4	124.0	4.7	30.0
Chloromethane		106.2	23.8	166.5	0.6	30.0
1,1-Dichloroethane		97.2	71.5	126.2	5.2	30.0
1,1-Dichloroethene		88.5	69.6	139.4	6.2	30.0
1,2-Dibromo-3-chloropropane		105.4	21.2	189.4	15.1	30.0
1,2-Dibromoethane		97.8	70.3	133.7	7.9	30.0
1,2-Dichlorobenzene		88.5	10.0	166.2	5.5	30.0
1,2-Dichloroethane		96.7	76.0	126.3	2.6	30.0
1,2-Dichloropropane		99.4	78.6	126.4	4.5	30.0
1,3-Dichlorobenzene		94.5	77.0	131.3	5.8	30.0
1,4-Dichlorobenzene		92.8	20.7	137.7	5.0	30.0
cis-1,2-Dichloroethene		97.2	76.6	122.1	4.8	30.0
cis-1,3-Dichloropropene		96.7	79.8	129.9	4.3	30.0
Dibromochloromethane		95.4	74.6	127.2	7.4	30.0
Dibromomethane		99.3	76.9	122.1	1.0	30.0
Dichlorodifluoromethane		78.2	10.0	222.8	2.4	30.0
Diethyl ether		102.3	67.4	121.2	3.2	30.0
trans-1,2-Dichloroethene		93.4	73.6	129.3	5.3	30.0
trans-1,3-Dichloropropene		96.8	74.0	131.3	7.0	30.0
trans-1,4-Dichloro-2-butene		115.0	68.6	135.4	1.3	30.0
Ethylbenzene		90.6	79.5	129.1	8.9	30.0
2-Hexanone		104.7	55.4	136.9	5.9	30.0
Hexachloroethane		86.0	23.8	138.1	10.9	30.0
p-Isopropyltoluene		93.0	79.8	137.5	8.7	30.0

## QC Report - Batch QC Results

### Organics - Volatiles, Prep Batch ID: VF211207W4 (continued)

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

### Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 211207B9.LCSDW07A, Parent Sample ID: 211207B9.LCSW07A

Run in Batch: 211207B9, Run Date: 12/07/2021 21:59, Prep Date: 12/07/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isopropylbenzene		86.9	74.4	121.5	4.5	30.0
2-Methylnaphthalene		116.5	25.5	165.5	26.8	30.0
4-Methyl-2-pentanone (MIBK)		104.2	71.6	125.2	2.2	30.0
tert-Methyl butyl ether (MTBE)		103.4	73.2	122.4	2.8	30.0
Methyl iodide		94.8	68.8	116.4	7.4	30.0
Methylene chloride		93.9	73.3	121.1	5.3	30.0
Naphthalene	*	122.7	32.9	135.8	36.4	30.0
n-Propylbenzene		85.0	82.0	130.7	7.1	30.0
Styrene		91.9	69.5	126.7	6.7	30.0
1,1,1,2-Tetrachloroethane		97.0	80.3	128.2	5.3	30.0
1,1,1-Trichloroethane		90.8	79.4	130.9	5.9	30.0
1,1,2,2-Tetrachloroethane		88.6	79.8	126.3	0.1	30.0
1,1,2-Trichloroethane		100.8	78.7	123.1	8.9	30.0
1,2,3-Trichlorobenzene	*	117.1	75.4	131.4	31.2	30.0
1,2,3-Trichloropropane		91.3	78.3	138.8	1.2	30.0
1,2,3-Trimethylbenzene		95.6	76.3	124.2	7.9	30.0
1,2,4-Trichlorobenzene		94.1	27.4	143.4	10.0	30.0
1,2,4-Trimethylbenzene		88.9	81.4	130.8	4.9	30.0
1,3,5-Trimethylbenzene		89.5	81.3	128.9	8.5	30.0
Tetrachloroethene		87.6	74.5	124.5	9.5	30.0
Tetrahydrofuran		101.2	59.0	117.9	0.2	30.0
Toluene		93.8	79.8	124.5	10.3	30.0
Trichloroethene		93.0	79.7	124.2	6.0	30.0
Trichlorofluoromethane		79.0	59.7	151.8	24.8	30.0
Vinyl chloride		93.6	43.5	149.1	14.0	30.0
o-Xylene		90.7	80.2	131.0	7.2	30.0
p,m-Xylene		90.7	79.4	132.2	9.3	30.0

# QC Report - Batch QC Results

## Organics - Volatiles, Prep Batch ID: VS211210W3

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

### Blank (BLK)

Lab Sample ID: 211210C9.BLKW10C

Run in Batch: 211210C9, Run Date: 12/11/2021 09:16, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane		ND	1.00	ug/l

### Laboratory Control Sample (LCS)

Lab Sample ID: 211210C9.LCSW10C

Run in Batch: 211210C9, Run Date: 12/11/2021 08:15, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		101.0	70.0	130.0

### Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 211210C9.LCSDW10C, Parent Sample ID: 211210C9.LCSW10C

Run in Batch: 211210C9, Run Date: 12/11/2021 08:35, Prep Date: 12/10/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		98.8	70.0	130.0	2.2	30.0

# Merit Laboratories Login Checklist

Lab Set ID:S30951

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.04700 / Racer Lansing

Submitted: 12/03/2021 16:30 Login User: MMC

Attention: Kaitlyn Hunt

Address: Arcadis  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: O:248-809-4013 FAX:

Email: Kaitlyn.Hunt@arcadis.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.1
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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 Z



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 137874

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Kaitlyn Hunt  
 COMPANY Arcadis  
 ADDRESS 28550 Cabot Drive, Suite 500  
 CITY Novi STATE Mi ZIP CODE \_\_\_\_\_  
 PHONE NO. 947-777-5215 FAX NO. \_\_\_\_\_ P.O. NO. 300759.04700  
 E-MAIL ADDRESS Kaitlyn.hunt@arcadis.com QUOTE NO. \_\_\_\_\_

CONTACT NAME SAME  
 COMPANY \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. \_\_\_\_\_ E-MAIL ADDRESS \_\_\_\_\_

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME 30075941.04700 SAMPLER(S) - PLEASE PRINT/SIGN NAME Jah P. Salkiewicz  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other \_\_\_\_\_  
 Special Instructions \_\_\_\_\_

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

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	1,4-Dioxane 826013-SIAS VOLs 826013-SIAS										
	DATE	TIME																					
30951.01	12/3/21	1020	MW-17-86_120321	GW	3		X						X	X									
.02	12/3/21	1140	MW-19-115_120321	GW	3		X						X										
.03	12-3-21	1250	MW-19-116_120321	GW	3		X						X										
.04	12/3/21	1415	MW-19-117_120321	GW	3		X						X										
.05	12/3/21	1525	MW-19-120_120321	GW	3		X						X	X									
.06	12/3/21	1550	Trip Blank	GW	1		X							X									
.07	12/3/21	PM	Dup. 02-120321	GW	3		X						X										

RELINQUISHED BY: [Signature]  Sampler DATE 12-3-21 TIME 1630  
 RECEIVED BY: Merit Storage DATE 12-3-21 TIME 1630

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

RELINQUISHED BY: Merit Drop Box DATE 12/3/21 TIME 1630  
 RECEIVED BY: Johanna Murray DATE 12/3/21 TIME 1630

SEAL NO. \_\_\_\_\_ SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. \_\_\_\_\_ SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: TEMP. ON ARRIVAL 4.1



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C.O.C. PAGE # 2 OF 2 140971

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME: Kaitlyn Hunt  
 COMPANY: Arcadis  
 ADDRESS: 28550 Cabot Drive Suite 500  
 CITY: Novi STATE: MI ZIP CODE: 48377  
 PHONE NO.: 947-777-5215 FAX NO.: \_\_\_\_\_ P.O. NO.: \_\_\_\_\_  
 E-MAIL ADDRESS: Kaitlyn.Hunt@arcadis.com QUOTE NO.: \_\_\_\_\_

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

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME: 30075941\_04700/Racis Lansing SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Dan Reims  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other \_\_\_\_\_  
 Special Instructions

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

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	1,4 Dioxane VOCs										
	DATE	TIME																					
30951.08	12/3/21	0930	MW-19-122-120321	GW	3		X						X										
09	12/3/21	1045	PW-14-01-120321	GW	3		X						X										
10	12/3/21	1225	MW-21-140-120321	GW	3		X						X										
11	12/3/21	1400	MW-16-85-120321	GW	3		X						X										
12	12/3/21	1510	MW-21-142-120321	GW	3		X						X										

RELINQUISHED BY: [Signature] \*Sampler DATE: 12-3-21 TIME: 1630  
 RECEIVED BY: Merit Storage DATE: 12-3-21 TIME: 1630  
 RELINQUISHED BY: merit Drop Box DATE: 12/3/21 TIME: 1630  
 RECEIVED BY: Johanna Murray DATE: 12/3/21 TIME: 1630

RELINQUISHED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_ NOTES: TEMP. ON ARRIVAL 4.1  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_

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