MEMORANDUM

TO:	Jacob Runge	cc:	Richard Conforti – EGLE John McCabe – EGLE Nicole Sanabria – EGLE David Favero – RACER Trust Kevin Schneider – Ramboll
FROM:	Clifford Yantz		
RE:	Vapor Intrusion Sampling Event		
FILE:	15388/72202/5		
DATE:	October 21, 2019		

This technical memorandum has been prepared on behalf of the Revitalizing Auto Communities Environmental Response Trust (RACER Trust) to document the 2018 additional vapor probe installation and sampling event conducted in October 2018 at Coldwater Road Landfill facility located in Flint, Michigan (Site) (**Figure 1**).

The additional vapor probe installation and sampling event was conducted in the spirit of providing greater certainty and comfort with the results from June 2018 sampling. It involved the installation of three new nested vapor probes, one approximately 45 feet due west of VP-1 at the eastern edge of Temple Street within the road right of way, and the other two approximately half way between VP-1 and VP-2, and VP-1 and VP-3, as trees and other obstructions allowed. Sampling was performed to confirm the analytical results from the December 2017 and June 2018 vapor probe installation / sampling events and to further evaluate the vapor intrusion (VI) pathway between the potential sources of contamination (former wastewater treatment plant [WWTP] and closed lagoons) and off-site residences. The probes were installed in September 2018 in accordance with the work plan submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE's formerly MDEQ) on August 31, 2018 while conducting other Site investigation activites with a Geoprobe® and the sampling was conducted in October 2018 while we were collecting similar samples at another Site in the Flint area.

We apologize for the delay in providing these results, and acknowledge receipt of your August 13, 2019 email conditionally approving the August 31, 2018 work plan with following provisions:

- In addition to sampling the new soil-gas probes, the next sampling event also includes sampling of VP-2 and VP-3 nested soil gas probes.
- In the event that water is encountered in any soil gas probes, then a groundwater sample is collected.
- As part of the final report on the results of the soil-gas sampling, utility corridor information is presented on a figure.

In response to your email, we suggest that an additional round of vapor samples be collected from nested vapor probes VP-2 through VP-6 and that groundwater samples for volatile organic compounds (VOCs) be collected in leu of vapor samples if groundwater is encountered in any of the soil gas probes.

SITE DESCRIPTION

The RACER Trust Coldwater Road Landfill facility consists of the wastewater treatment sludge monofill landfill, Remaining Materials Area (RMA, where nickel impacted soils were closed in place), former WWTP (decommissioned and demolished in 1999), restored wetlands, and leachate accumulation facility.

The Site is bordered on the south and east by the RACER Trust Coldwater Road Industrial Land, which formerly contained several manufacturing buildings and support facilities. The buildings on the Coldwater Road Industrial Land were decommissioned and demolished between 1999 and 2001.

VAPOR INTRUSION PROBE INSTALLATION

Three nested soil vapor points were installed, one along the eastern edge of Temple Street, one between VP-1 and VP-2, and another between VP-1 and VP-3, on September 13, 2018. See **Figure 2** for VI boring locations.

The nested vapor probes were installed according to the requirements set forth in the EGLE's May 2013 *Guidance Document for the Vapor Intrusion Pathway* and the methods specified in Appenix F.1 Installation of a Soil Gas Probe/Vapor Monitoring Point to Support Vapor.

The three nested soil vapor points were installed by Stock Drilling, utilizing direct push drilling techniques (Geoprobe® 7822 track-mounted drilling rig). At the soil vapor sampling locations, a shallow (S) (approximately 5' feet below ground surface [ft bgs]), middle (M) (approximately 10' ft bgs), and deep (D) (approximately 15' ft bgs) sample point was installed at each location.

Five-foot-long, 1.25-inch Macro-Core® samplers were used to collect soil cores continuously from grade to the terminal depth. The soil boring was advanced to a depth of 15 ft bgs.

Once the soil core depth was reached for each run, the sampler was removed from the borehole, detached from the drill rods, and the acetate sleeve was cut length-wise and opened to allow for observation of the subsurface soil. The soil cores were visually inspected and logged by an OBG soil scientist in accordance with the Unified Soil Classification System (USCS). **Attachment A** provides the soil boring logs for VP-4, VP-5, and VP-6, and the vapor probe construction logs for all three vapor probes installed at each location at the Site. North-south and east-west geologic cross-sections were constructed through the area of concern utilizing historical information and the soil boring information collected in December 2017 and June 2018 (**Figure 3**).

The vapor points consisted of a 6-inch length of double woven stainless steel wire screen attached to an appropriate length of high density polyethylene tubing.

Once the target depth was reached, the drive rods were withdrawn as the annular space around the sampling point was packed with glass beads approximately 6 inches above the screened interval on the shallow probes. The remainder of the boring's annular space was sealed to prevent ambient air infiltration between screened zones and above the shallow sampling zone to the ground surface with dry fine granular bentonite that was hydrated at 1 ft intervals.

A roadbox cover was installed just below the ground surface to secure the extra tubing.

SAMPLING & ANALYSIS

Sample collection activities were completed on October 25, 2018, in accordance with the previously mentioned guidance documents. A more detailed description of the procedures used during the sampling event can be found in OBG's response letter, dated November 16, 2017, to EGLE's Comments on Per- and Polyfluorinated Substances Sampling Event – Letter Dated October 12, 2017.

Soil gas grab samples were attempted from vapor probes VP-4S, VP-4M, VP-4D, VP-5S, VP-5M, VP-5D, VP-6S, VP-6M, and VP-6D.

Due to interference from groundwater, samples were not able to be collected from vapor probes, VP-4S, VP-4M, VP-4D, or VP-5D.

SAMPLE PROCEDURE

Prior to the collection of the soil vapor samples, the sample tubing was purged of ambient air. A minimum of three volumes of air within the sample probe and tubing were purged prior to sample collection. In addition, helium tracer gas screening was used during sampling of the soil vapor probes to evaluate the adequacy of the sampling technique and identify potential short-circuiting from the ground surface during sample collection.

A MGD 2002 gas leak detector was used to screen the extracted vapor stream for helium prior to and after sample collection. No olfactory observations were recognized during probe installation and sampling. Short-circuiting was not observed during initial or final screening. See **Attachment B** for Soil Vapor (Bottle Vac®) Sample Collection Field Forms.

The soil gas samples were collected in Bottle Vacs® and transported to the laboratory under appropriate chain-of-custody (COC) protocols. The soil gas samples were submitted to Merit Laboratories in East Lansing, Michigan a National Environmental Laboratory Accreditation Conference (NELAC)-certified laboratory for analysis by USEPA Method TO-15. For quality control purposes, a field duplicate sample (DUP-1) was collected from the VP-5S vapor probe location.

ANALYTICAL RESULTS

The analytical results for the samples collected at the Coldwater Road Landfill facility are presented in **Table 1** and discussed below. The complete analytical laboratory report is contained in **Attachment C**.

From the five samples and one duplicate collected (VP-5S, VP-6S, VP-5M, VP-6M, VP-6D, and DUP-1 [VP-5S]) no VOCs were detected above the EGLE August 2017 proposed screening criteria.

SUMMARY

The June 2018 analytical result from the VP-1S duplicate (91 µg/m^3) was above the EGLE August 2017 proposed screening criteria of 67 µg/m^3 for trichloroethene; however, in December 2017, trichloroethene was not detected at VP-1S. During the December 2017 VI sampling event, 1,2-Dichloroethane was detected above its August 2017 proposed screening criteria of 33 µg/m^3 at vapor probes VP-1S (85 µg/m^3) and VP-1D (130 µg/m^3); however, it was not detected at VP-1S during the June 2018 sampling event. Therefore, the VI results from VP-1S did not show consistent exceedances of the screening criteria.

The installation and sampling of three new nested vapor probes were conducted in the spirit of providing greater certainty and comfort with the results of the June 2018 sampling event. Because the October 2018 results do not exceed EGLE August 2017 proposed screening criteria, we believe there is not a consistent trend in exceedances; however, to address EGLE's August 2019 email we suggest that an additional round of vapor samples be collected from nested vapor probes VP-2 through VP-6 and that groundwater samples for VOCs be collected in lieu of vapor samples if groundwater is encountered in any of the soil gas probes.

After the EGLE has reviewed this report, RACER would like to have a conference call to discuss the results.

If you have any questions regarding this technical memorandum, please contact Cliff Yantz at (313) 333-0211.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

Clifford Scott Yantz

Clifford S. Yantz, PG
Senior Hydrogeologist

ENCLOSURES:

Table 1 – Vapor Intrusion Analytical Results – December 2017, June 2018, and October 2018
Figure 1 – Site Location Map
Figure 2 – Sample Location Map
Figure 3 – Cross Sections
Attachment A – Soil Boring and Vapor Probe Construction Logs
Attachment B – Soil Vapor (Bottle Vac®) Sample Collection Field Forms
Attachment C – Analytical Laboratory Results

Tables

TABLE 1
RACER Trust - Coldwater Road Landfill
Vapor Intrusion Sampling - Detections

Compound	Sample ID:	VP-1S	VP-1S	VP-1S (DUP-1)	VP-1D	VP-2S	VP-2S (VP-DUP-1)	VP-2S	VP-3S	VP-3D	EGLE Vapor Screening Levels
	Units:	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
	Sample Date:	*12/8/2017*	*6/29/2018*	*6/29/2018*	*12/8/2017*	*12/8/2017*	*12/8/2017*	*6/29/2018*	*6/29/2018*	*6/29/2018*	*August 2017 Proposed Criteria*
Acetone		<48	**48**	<48	**95**	<48	<48	<48	**48**	**570**	1.1E+06 (EE) st/**31,000**
Benzene		<6.4	**9.6**	<6.4	**13**	<6.4	<6.4	<6.4	**16**	**16**	110 ca
Carbon Disulfide		<16	**37**	**22**	<16	<16	<16	<16	**56**	**40**	24,000 nc
Chloroform		<9.8	<9.8	<9.8	<9.8	<9.8	<9.2	<9.8	**15**	<9.8	37 ca
Cyclohexane		<6.9	**14**	**10**	**17**	<6.9	<6.9	<6.9	<6.9	**6.9**	2.1E+05 nc
1,2-Dichloroethane		**85**	<8.1	<8.1	**130**	**8.1**	**12**	<8.1	<8.1	<8.1	33 ca
Ethanol		<64 X	<57 X	<47	<130 X	<47	<47	<47	<47	**2,116 E**	6.3E+05 (EE) st
Ethylbenzene		<8.7	**13**	<8.7	<8.7	<8.7	<8.7	**8.7**	<8.7	**130**	340 ca
Heptane		<8.2	**25**	<8.2	**12**	<8.2	<8.2	**12**	**16**	**25**	1.2E+05 nc
Hexane		**56**	**74**	**49**	**130**	<7.0	<7.0	**14**	**25**	**63**	24,000 nc
Isopropyl Alcohol		**370**	<49	<49	**590**	**49**	**74**	<49	<49	**170**	7,000 nc
2-Butanone (MEK)		<29	<29	<29	<29	<29	<29	<29	<29	**59**	1.7E+05 (DD) dev
Propylene		**618**	<262 X	<186 X	**303**	<3.4	<3.4	<3.4	<21 X	**1,800 E**	NA
1,2,4-Trimethylbenzene		<37	**25**	**15**	<9.8	<9.8	<9.8	**15**	**15**	<37	2,100 nc
2,2,4-Trimethylpentane		**9.3**	**47**	**28**	**37**	<9.3	<9.3	**14**	**14**	**28**	1.2E+05 nc
Tert-butyl Alcohol		<30	<30	<30	<30	<30	<30	<30	<30	**120**	NA
Tetrachloroethene		**27**	<14	<14	<14	<14	<14	<14	<14	<14	1,400 (EE) st/**41**
Tetrahydrofuran		<5.9	**27**	**18**	<5.9	<5.9	<5.9	**24**	**15**	**8.8**	70,000 nc
Toluene		**34**	**57**	**41**	**57**	<7.5	<7.5	**41**	**49**	**60**	1.7E+05 (EE) nc/**7,500**
Trichloroethene		<11	**43**	**91**	<11	<11	<11	**32**	<11	<11	67 (DD) dev
p,m-Xylene		<17	**39**	**22**	**22**	<17	<17	**30**	**30**	**380**	NA
o-Xylene		<8.7	**17**	**8.7**	<8.7	<8.7	<8.7	**13**	**13**	**96**	NA
Total Xylene		<26	**56**	**30**	<26	<26	<26	**43**	**43**	**480**	7,600 nc

Notes

Exceeds EGLE 2017 proposed Vapor Screening Levels

1) Concentrations in µg/m³ as noted
2) Detections highlighted in bold.
3) < = Not detected at specified reporting limit.
4) DUP = Duplicate sample.
5) NA = means not available.
6) Acceptable Air Values (AAV) endpoint basis used for site-specific criterion: (ca) = Carcinogenetic; (nc) = Non-Carcinogenetic; (dev) = Developmental; (mut) = Mutagenic cancer; (st) = Short-term (i.e., less than chronic exposure): Agency for Toxic Substances and Disease Registry Inhalation Minimum Risk Level for Acute Inhalation or Intermediate Inhalation exposure durations; U.S. Environmental Protection Agency Integrated Risk Information System Reference Concentration for short-term exposure; of Air Quality Division Acute Initial Threshold Screening Level.
7) X = Elevated reporting limit due to matrix interference.
8) E = Concentration exceeds calibration range.
9) (EE) = The residential or nonresidential acceptable air concentration (AAC) for the following hazardous substances is not derived pursuant to the equations of R 299.26 and R 299.27. The identified hazardous substance may cause adverse human health effects for less than chronic exposures. The AAC for these hazardous substances is the acute or intermediate minimum risk level (MRL) developed by the Agency for Toxic Substances and Disease Registry (ATSDR), a United States Environmental Protection Agency Integrated Risk Information System (IRIS) acute reference concentration, or an acute initial threshold screening level (ITSL) by the department. **Bold** where applicable (*i.e.* , this lower criteria is the EGLE Vapor
10) Sample was not collected during 12/8/17 event from vapor point VP-2D due to interference with groundwater.
11) Samples were not collected during 6/29/18 event from vapor points VP-1D, VP-2D, and VP-3M due to interference with groundwater.
12) Samples were not collected during 10/25/18 event from vapor points VP-4S, VP-4M, VP-4D, and VP-5D due to interference with groundwater.

TABLE 1
RACER Trust - Coldwater Road Landfill
Vapor Intrusion Sampling - Detections

Compound	Sample ID: / Units: / Sample Date:	VP-5S µg/m3 10/25/2018	VP-5S (DUP-1) µg/m³ 10/25/2018	VP-5M µg/m³ 10/25/2018	VP-6S µg/m³ 10/25/2018	VP-6M µg/m³ 10/25/2018	VP-6D µg/m³ 10/25/2018	EGLE Vapor Screening Levels µg/m³ August 2017 Proposed Criteria
Acetone		<48	<48	<48	<48	<48	<48	1.1E+06 (EE) st/**31,000**
Benzene		<6.4	<6.4	**9.6**	<6.4	<6.4	<6.4	110 ca
Carbon Disulfide		**75**	**78**	**290**	**140**	**250**	<16	24,000 nc
Chloroform		<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	37 ca
Cyclohexane		<6.9	<6.9	<6.9	<6.9	<6.9	<6.9	2.1E+05 nc
1,2-Dichloroethane		<8.1	<8.1	<8.1	<8.1	<8.1	<8.1	33 ca
Ethanol		<47	<47	<47	<47	<47	<47	6.3E+05 (EE) st
Ethylbenzene		<8.7	<8.7	<8.7	<8.7	<8.7	<8.7	340 ca
Heptane		<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	1.2E+05 nc
Hexane		**7.0**	**7.0**	**18**	**11**	<7.0	<7.0	24,000 nc
Isopropyl Alcohol		<49	<49	<49	<49	<49	<49	7,000 nc
2-Butanone (MEK)		<29	<29	<29	<29	<29	<29	1.7E+05 (DD) dev
Propylene		<8.6 X	<6.9 X	<62 X	<15 X	<12 X	<3.9	NA
1,2,4-Trimethylbenzene		<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	2,100 nc
2,2,4-Trimethylpentane		<9.3	<9.3	**14**	<9.3	<9.3	<9.3	1.2E+05 nc
Tert-butyl Alcohol		<30	<30	<30	<30	<30	<30	NA
Tetrachloroethene		<14	<14	<14	<14	<14	<14	1,400 (EE) st/**41**
Tetrahydrofuran		**12**	**12**	**15**	**12**	**8.8**	**5.9**	70,000 nc
Toluene		**38**	**38**	**45**	**19**	**15**	**11**	1.7E+05 (EE) nc/**7,500**
Trichloroethene		<11	<11	<11	<11	<11	<11	67 (DD) dev
p,m-Xylene		<17	<17	**22**	<17	<17	<17	NA
o-Xylene		<8.7	<8.7	<8.7	<8.7	<8.7	<8.7	NA
Total Xylene		<26	<26	<26	<26	<26	<26	7,600 nc

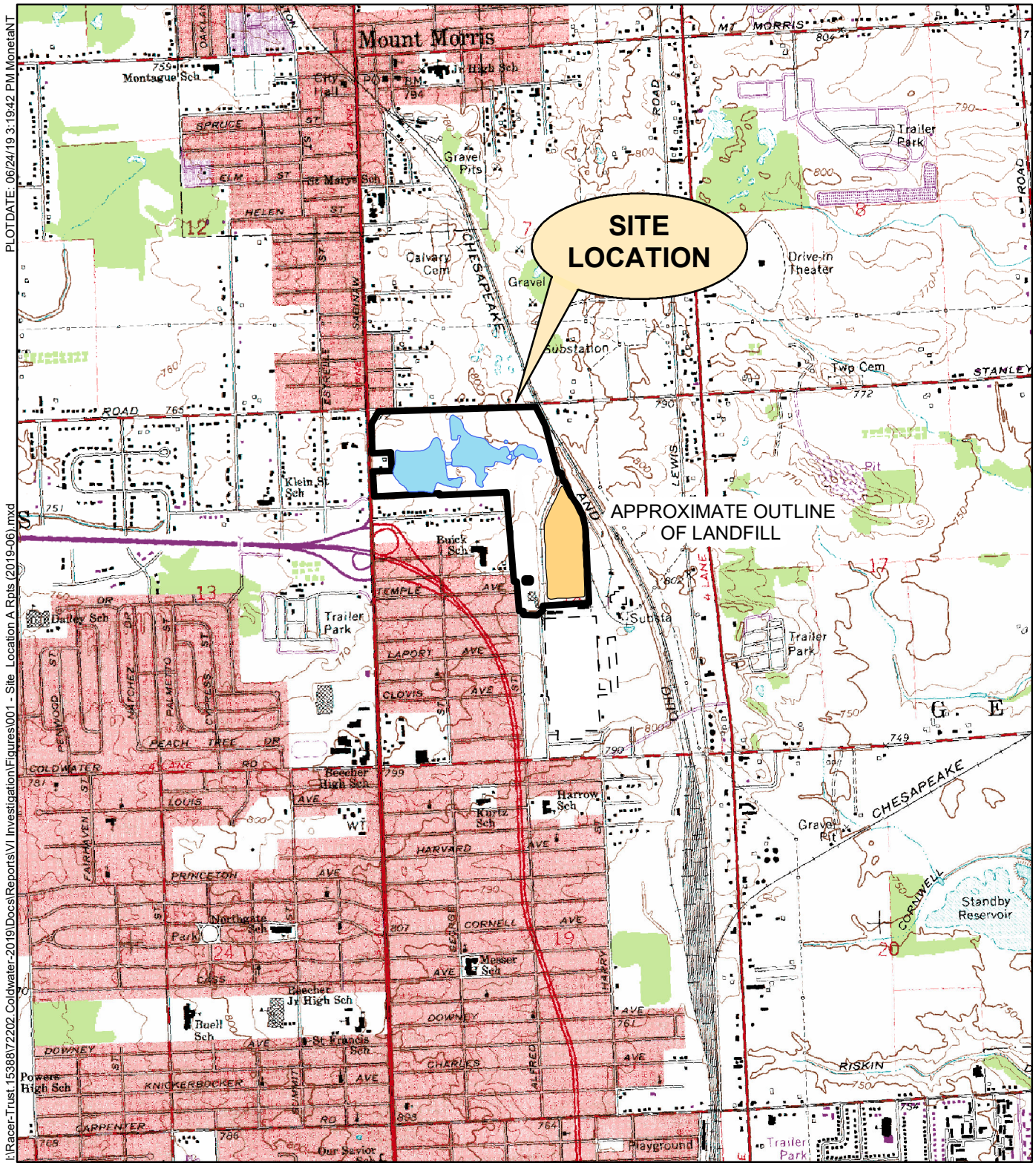
Notes

Exceeds EGLE 2017 proposed Vapor Screening Levels

1) Concentrations in µg/m³ as noted
2) Detections highlighted in bold.
3) < = Not detected at specified reporting limit.
4) DUP = Duplicate sample.
5) NA = means not available.
6) Acceptable Air Values (AAV) endpoint basis used for site-specific criterion: (ca) = Carcinogenetic; (nc) = Non-Carcinogenetic; (dev) = Developmental; (mut) = Mutagenic cancer; (st) = Short-term (i.e., less than chronic exposure): Agency for Toxic Substances and Disease Registry Inhalation Minimum Risk Level for Acute Inhalation or Intermediate Inhalation exposure durations; U.S. Environmental Protection Agency Integrated Risk Information System Reference Concentration for short-term exposure; of Air Quality Division Acute Initial Threshold Screening Level.
7) X = Elevated reporting limit due to matrix interference.
8) E = Concentration exceeds calibration range.
9) (EE) = The residential or nonresidential acceptable air concentration (AAC) for the following hazardous substances is not derived pursuant to the equations of R 299.26 and R 299.27. The identified hazardous substance may cause adverse human health effects for less than chronic exposures. The AAC for these hazardous substances is the acute or intermediate minimum risk level (MRL) developed by the Agency for Toxic Substances and Disease Registry (ATSDR), a United States Environmental Protection Agency Integrated Risk Information System (IRIS) acute reference concentration, or an acute initial threshold screening level (ITSL) by the department. **Bold** where applicable (*i.e.* , this lower criteria is the EGLE Vapor
10) Sample was not collected during 12/8/17 event from vapor point VP-2D due to interference with groundwater.
11) Samples were not collected during 6/29/18 event from vapor points VP-1D, VP-2D, and VP-3M due to interference with groundwater.
12) Samples were not collected during 10/25/18 event from vapor points VP-4S, VP-4M, VP-4D, and VP-5D due to interference with groundwater.

Figures

FIGURE 1



RACER TRUST
COLDWATER ROAD LANDFILL FACILITY
FLINT, MICHIGAN

SITE LOCATION MAP

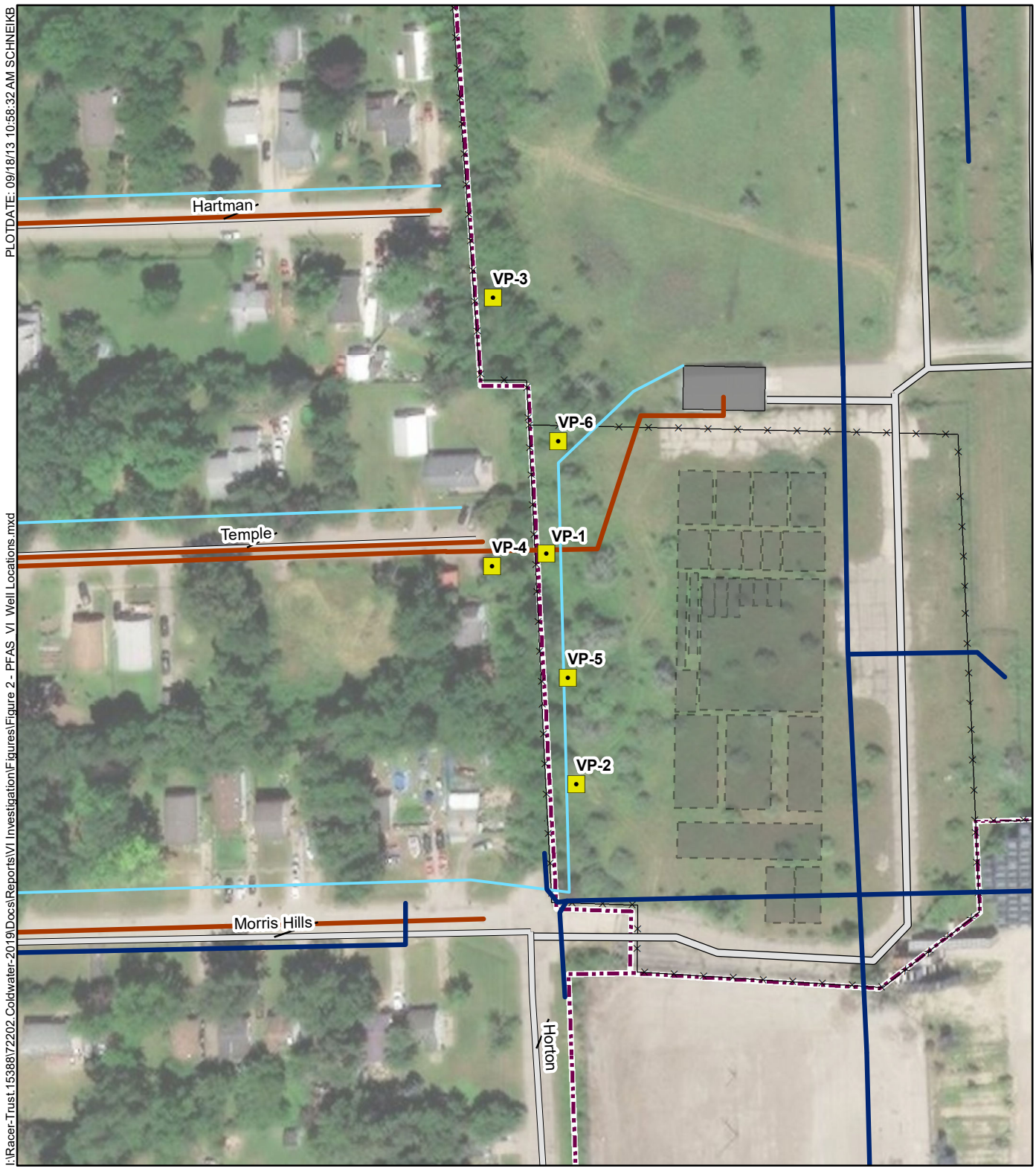
0 1
Miles

N

15388/68545/001
JUNE 2019

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 2



LEGEND

- VAPOR POINT LOCATION
- FORMER BUILDING
- WATER LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- PROPERTY BOUNDARY

RACER TRUST
COLDWATER ROAD
FLINT, MICHIGAN

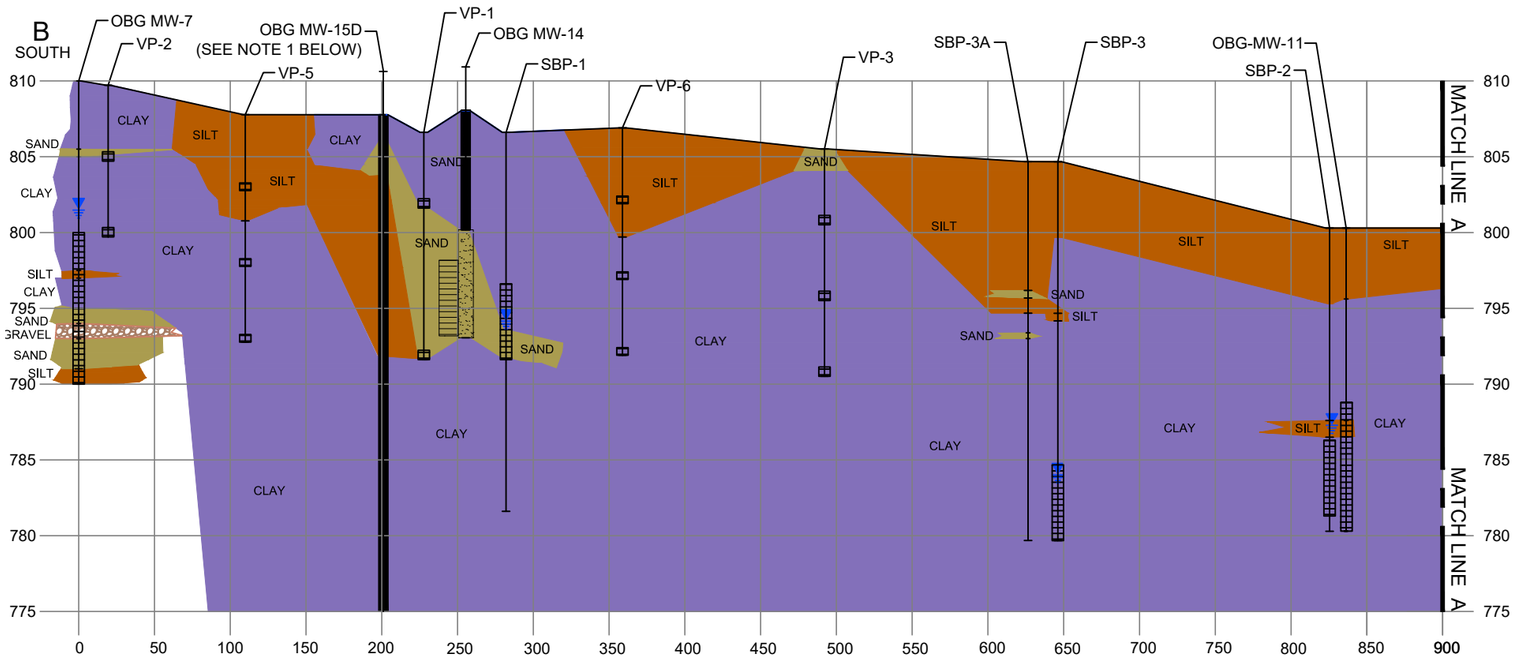
VAPOR POINT LOCATIONS

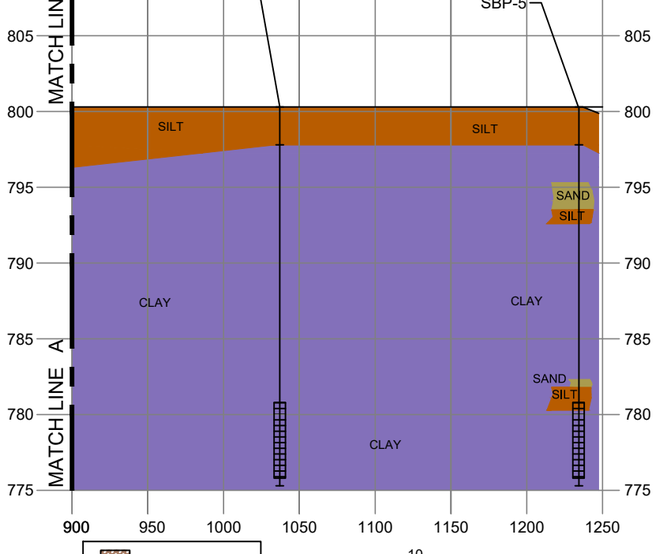
0 50 100 200
Feet

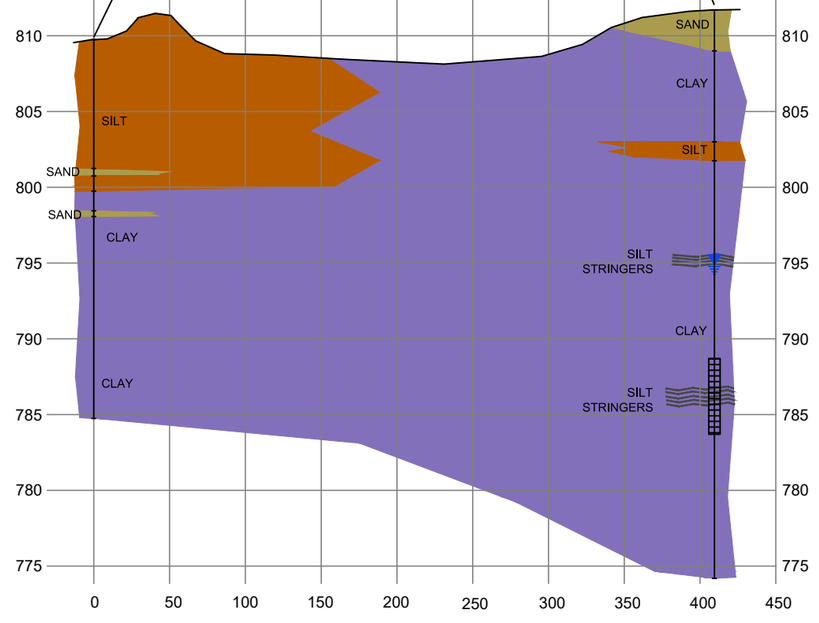
N

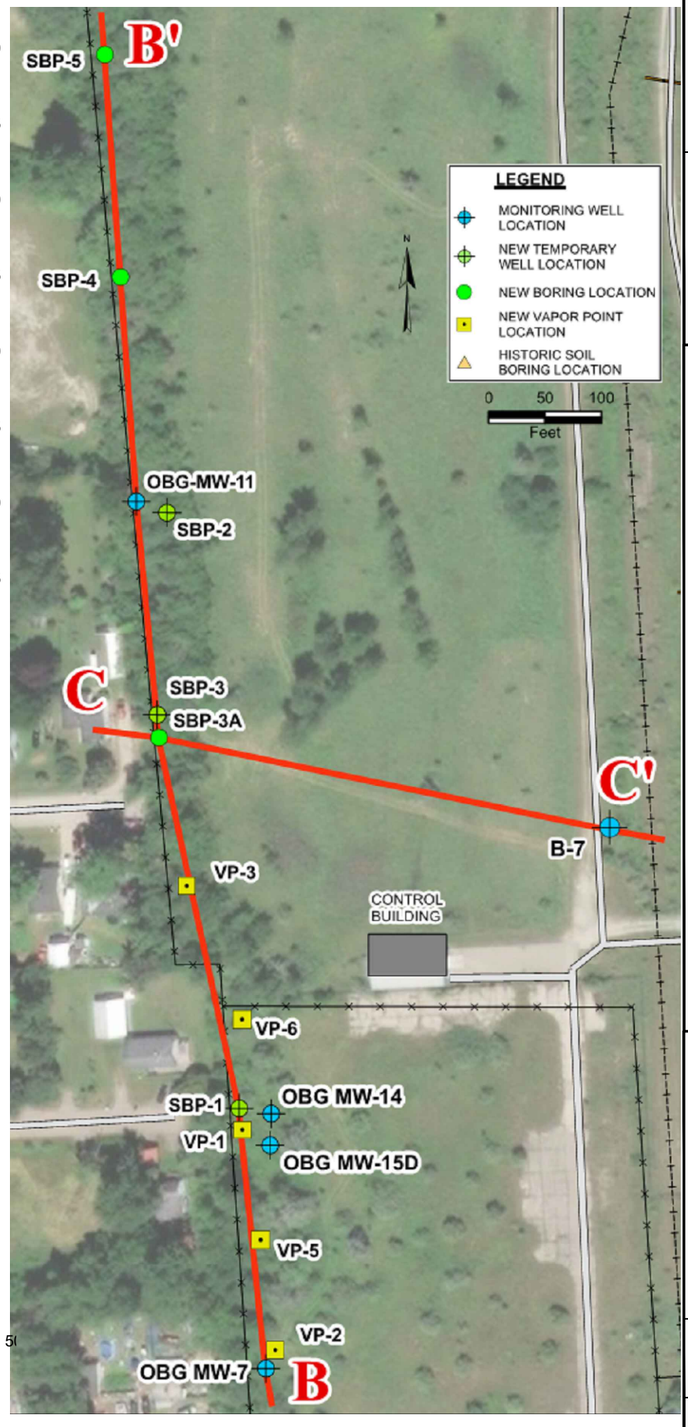
O'BRIEN & GERE ENGINEERS, INC.

15388/72202
OCTOBER 2019









GRAVEL
SAND
SILT
CLAY
WELL SCREEN
WATER LEVEL AT TIME OF SAMPLING

VERTICAL SCALE IN FEET: 10
HORIZONTAL SCALE IN FEET: 100
VERTICAL EXAGGERATION =10

NOTE:

1. INFORMATION SHOWN BELOW 775 FT MSL IS NOT PROVIDED AS IT IS NOT PERTINENT TO THE VI STUDY.

DRAWN BY: JMO DATE: 01/16/2018
CHECKED BY: CSY DATE: 01/16/2018
APPROVED BY: CSY DATE: 01/16/2018
DRAWING NO:
REFERENCE: .

GEOLOGIC CROSS-SECTION B-B'
GEOLOGIC CROSS-SECTION C-C'

RACER
COLDWATER ROAD LANDFILL SITE
FLINT, MICHIGAN

OBRIEN & GERE

PROJECT NO.
68545

FIGURE NO.
3

ATTACHMENT A

Soil Boring Logs & Vapor Probe Construction Logs

O'BRIEN & GERE

BORING LOG

WELL NO. VP-4

PROJECT: Coldwater Road Landfill
CLIENT: RACER Trust
INSPECTOR: KevinSchneider

SHEET 1 OF 1

JOB NO. 72202

DRILLING CONTRACTOR: Stock Drilling
DRILLER: Earnest Plylar
PURPOSE: Vapor probe installation
DRILLING METHOD: Direct Push
DRILL RIG TYPE: Geoprobe 7730DT

GROUND ELEV.

DATUM

DATE STARTED 9/13/2018

DATE FINISHED 9/13/2018

	SAMPLE	CORE	CASING
TYPE	SS	Soil Liner/Dual Tube	
DIA.	2"	2"	---

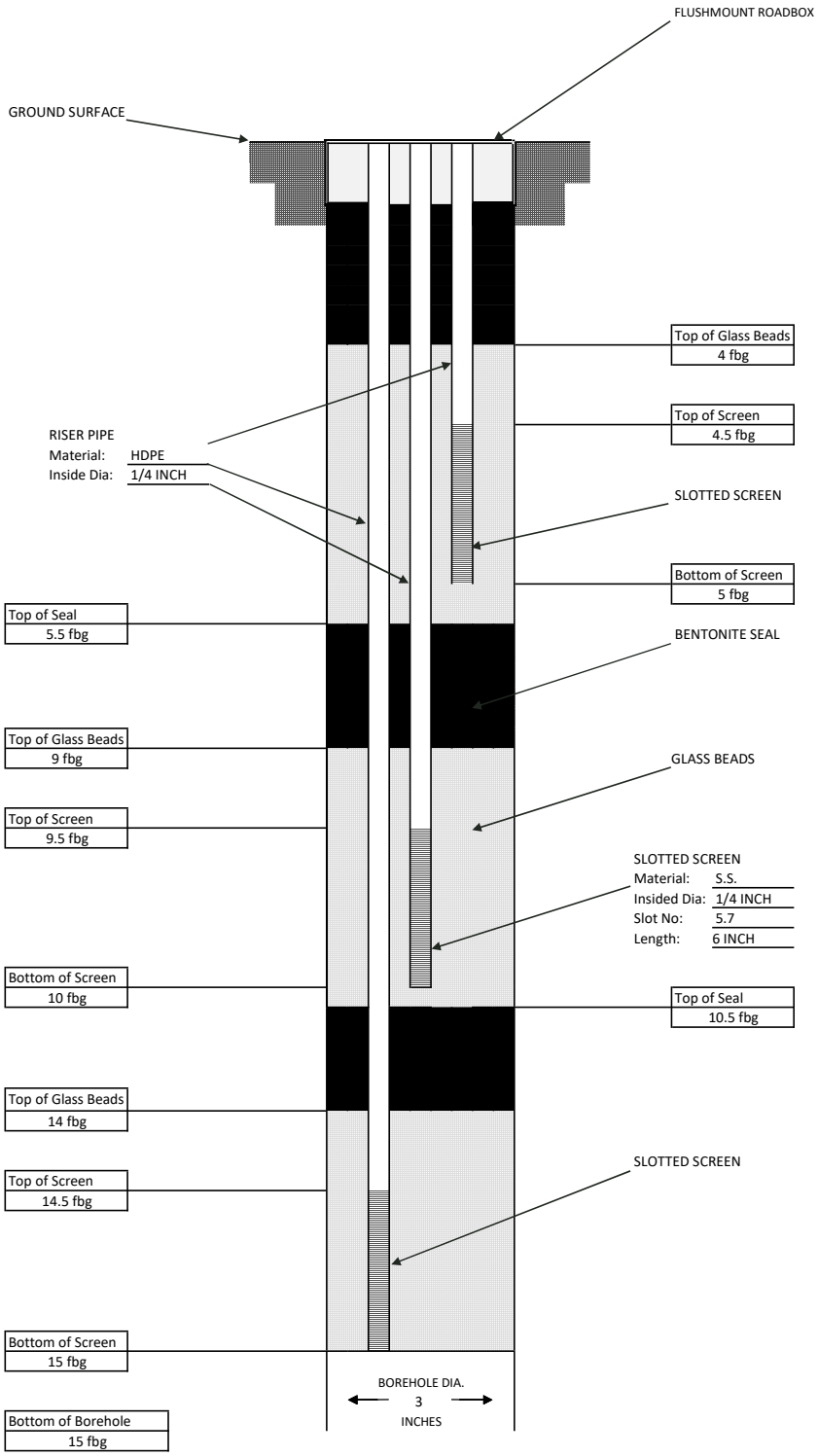
DEPTH (ft)	Sample Type Number	Blows/6" (N Value)	Penetration/ Recovery	MATERIAL DESCRIPTION	Graphic Log	USCS Symbol	Stratum Change	Field Testing PID (ppm)	Well Graphic	REMARKS
				top soil	0.2			0		
				dry, moderate yellowish brown, silty fine SAND, little gravel	0.5	SM				
				silty CLAY	0.8	CL				
				dry, moderate yellowish brown, silty fine SAND and gravel	1.4	SM				
2	SS-1		5.0'/ 3.1'	dry, moderate yellowish brown, silty CLAY, trace gravel, light gray mottling		CL		0		
4						CL		0		
				dry to moist, moderate yellowish brown, silty CLAY, stiff to very stiff, trace gravel, low plastic		CL		0		
6				some silt		CL		0		
8	SS-2		5.0'/ 5.0'			CL		0		
10				pushed rock, dry to moist, light gray, silty CLAY		CL		0		
12	SS-3		5.0'/ 1.4'			CL		0		
14					15.0			0		

End of Borehole at 15.0'.

Notes: Boring location on Temple Road. Vapor probes set at 5', 10', and 15'.

Report Name: NEW OBG BORING LOG Data Template: OBG GINT STD US.GDT

VP-4 S/M/D


FLUSHMOUNT ROADBOX
GROUND SURFACE
Top of Glass Beads
4 fbg
Top of Screen
4.5 fbg
RISER PIPE
Material: HDPE
Inside Dia: 1/4 INCH
SLOTTED SCREEN
Bottom of Screen
5 fbg
Top of Seal
5.5 fbg
BENTONITE SEAL
Top of Glass Beads
9 fbg
GLASS BEADS
Top of Screen
9.5 fbg
SLOTTED SCREEN
Material: S.S.
Insided Dia: 1/4 INCH
Slot No: 5.7
Length: 6 INCH
Bottom of Screen
10 fbg
Top of Seal
10.5 fbg
Top of Glass Beads
14 fbg
Top of Screen
14.5 fbg
SLOTTED SCREEN
Bottom of Screen
15 fbg
BOREHOLE DIA.
3
INCHES
Bottom of Borehole
15 fbg

O'BRIEN & GERE

BORING LOG

WELL NO. VP-5

PROJECT: Coldwater Road Landfill
CLIENT: RACER Trust
INSPECTOR: KevinSchneider

SHEET 1 OF 1

JOB NO. 72202

DRILLING CONTRACTOR: Stock Drilling
DRILLER: Earnest Plylar
PURPOSE: Vapor probe installation
DRILLING METHOD: Direct Push
DRILL RIG TYPE: Geoprobe 7730DT

GROUND ELEV.

DATUM

DATE STARTED 9/13/2018

DATE FINISHED 9/13/2018

	SAMPLE	CORE	CASING
TYPE	SS	Soil Liner/Dual Tube	
DIA.	2"	2"	---

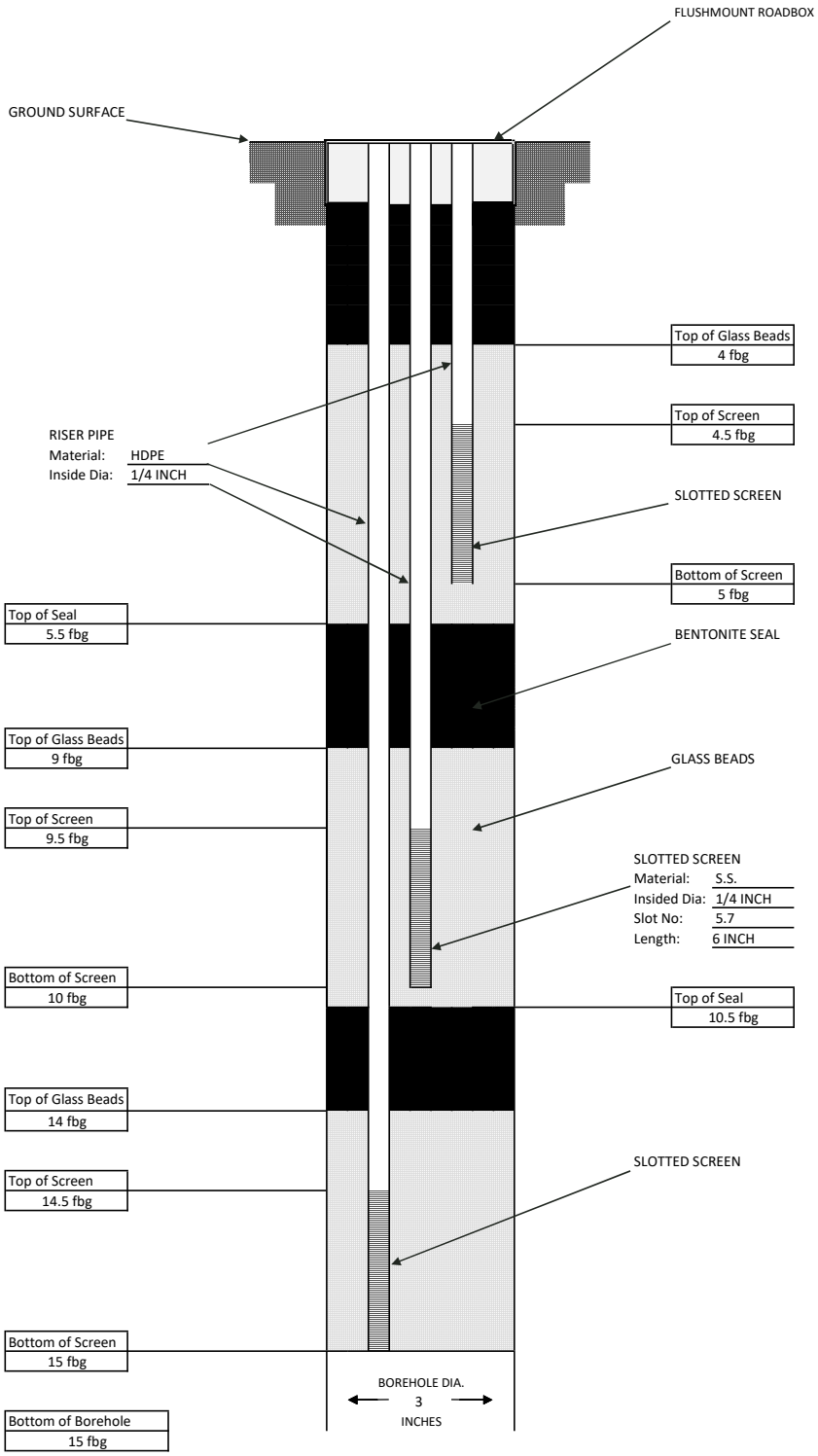
DEPTH (ft)	Sample Type	Number	Blows/6" (N Value)	Penetration/ Recovery	MATERIAL DESCRIPTION	Graphic Log	USCS Symbol	Stratum Change	Field Testing PID (ppm)	Well Graphic	REMARKS
0					top soil (0.2)				0		
					dry, moderate brown, clayey SILT, little sand		ML				
2		SS-1		5.0'/ 3.5'	dry, moderate yellowish brown, clayey SILT, little sand		ML		0		
4							ML		0		
6					same as above		ML		0		
					(7.0)						
8		SS-2		5.0'/ 5.0'	dry, moderate yellowish brown, silty CLAY, trace gravel, stiff to very stiff, non-plastic		CL		0		
10					same as above				0		
12		SS-3		5.0'/ 5.0'			CL		0		
14					dry to moist, light gray, silty CLAY, trace gravel, trace moderate yellowish brown mottling		CL		0		
					(15.0)						

End of Borehole at 15.0'.

Notes: Boring location between VP-1 and VP-3. Vapor probes set at 5', 10', and 15'.

Report Name: NEW OBG BORING LOG Data Template: OBG GINT STD US.GDT

VP-5 S/M/D


FLUSHMOUNT ROADBOX
GROUND SURFACE
Top of Glass Beads
4 fbg
Top of Screen
4.5 fbg
RISER PIPE
Material: HDPE
Inside Dia: 1/4 INCH
SLOTTED SCREEN
Bottom of Screen
5 fbg
Top of Seal
5.5 fbg
BENTONITE SEAL
Top of Glass Beads
9 fbg
GLASS BEADS
Top of Screen
9.5 fbg
SLOTTED SCREEN
Material: S.S.
Insided Dia: 1/4 INCH
Slot No: 5.7
Length: 6 INCH
Bottom of Screen
10 fbg
Top of Seal
10.5 fbg
Top of Glass Beads
14 fbg
Top of Screen
14.5 fbg
SLOTTED SCREEN
Bottom of Screen
15 fbg
BOREHOLE DIA.
3
INCHES
Bottom of Borehole
15 fbg

O'BRIEN & GERE

BORING LOG

WELL NO. VP-6

PROJECT: Coldwater Road Landfill
CLIENT: RACER Trust
INSPECTOR: KevinSchneider

SHEET 1 OF 1

JOB NO. 72202

DRILLING CONTRACTOR: Stock Drilling
DRILLER: Earnest Plylar
PURPOSE: Vapor probe installation
DRILLING METHOD: Direct Push
DRILL RIG TYPE: Geoprobe 7730DT

GROUND ELEV.

DATUM

DATE STARTED 9/13/2018

DATE FINISHED 9/13/2018

	SAMPLE	CORE	CASING
TYPE	SS	Soil Liner/Dual Tube	
DIA.	2"	2"	---

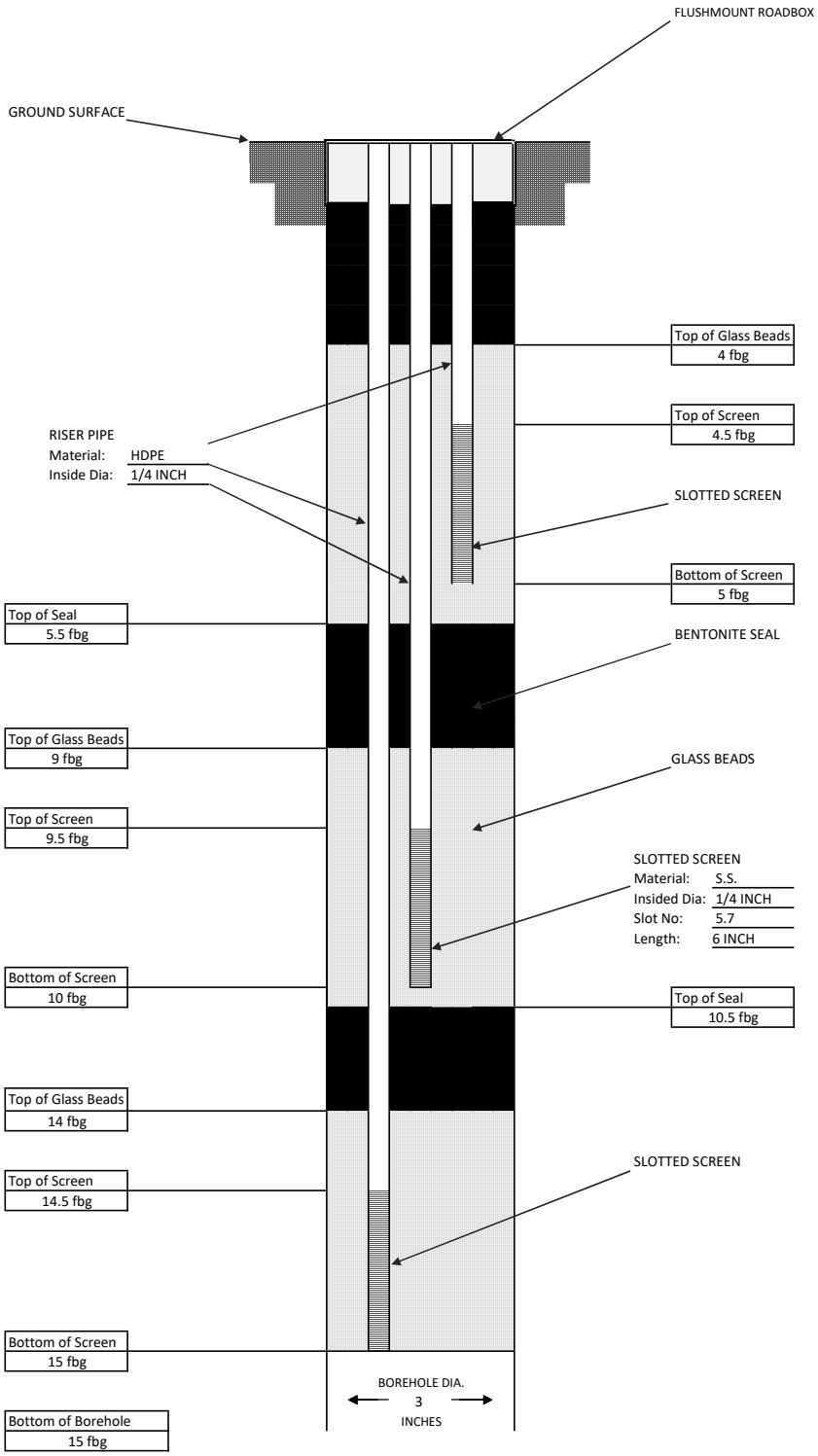
DEPTH (ft)	Sample Type	Number	Blows/6" (N Value)	Penetration/ Recovery	MATERIAL DESCRIPTION	Graphic Log	USCS Symbol	Stratum Change	Field Testing PID (ppm)	Well Graphic	REMARKS
0					top soil (0.2)				0		
					dry, moderate yellowish brown, silty very fine SAND		SM				
2		SS-1		5.0'/ 3.1'	more dense		SM		0		
4							SM		0		
6					same as above		SM		0		
					(7.2)						
8		SS-2		5.0'/ 4.8'	dry, moderate yellowish brown, silty CLAY, trace gravel, very stiff, non-plastic		CL		0		
10					same as above		CL		0		
12		SS-3		5.0'/ 5.0'			CL		0		
14					dry to moist, light gray, silty CLAY, trace gravel, little moderate yellowish brown mottling, very stiff, non-plastic		CL		0		
					(15.0)						

End of Borehole at 15.0'.

Notes: Boring location 200' north of VP-2 and 200' south of VP-1. Vapor probes set at 5', 10', and 15'.

Report Name: NEW OBG BORING LOG Data Template: OBG GINT STD US.GDT

VP-6 S/M/D


FLUSHMOUNT ROADBOX
GROUND SURFACE
Top of Glass Beads
4 fbg
Top of Screen
4.5 fbg
RISER PIPE
Material: HDPE
Inside Dia: 1/4 INCH
SLOTTED SCREEN
Bottom of Screen
5 fbg
Top of Seal
5.5 fbg
BENTONITE SEAL
Top of Glass Beads
9 fbg
GLASS BEADS
Top of Screen
9.5 fbg
SLOTTED SCREEN
Material: S.S.
Insided Dia: 1/4 INCH
Slot No: 5.7
Length: 6 INCH
Bottom of Screen
10 fbg
Top of Seal
10.5 fbg
Top of Glass Beads
14 fbg
Top of Screen
14.5 fbg
SLOTTED SCREEN
Bottom of Screen
15 fbg
BOREHOLE DIA.
3
INCHES
Bottom of Borehole
15 fbg

ATTACHMENT B

Soil Vapor (Bottle Vac®) Sample Collection Field Forms

Soil Vapor (Bottle Vac®) Sample Collection Field Form

Project # 68545 Date 10/25/18

Project Name Coldwater Rd Collector KHS

Sample ID	VP-4S	VP-4M	VP-4D
Start Date/Time	10/25 1423	10/25 1425	10/25 1427
End Date/Time	1523	1441	1503
Bottle/Canister ID	13742	16843	12447
Flow controller ID	105	53	47

	VP-4S	VP-4M	VP-4D
Vacuum gauge "zero" ("Hg)	No -2	-3	-3
Start Pressure ("Hg)	-30	-30+	-30
End Pressure ("Hg)	-23	-30	-27
End pressure = "zero"?	-2	-3	-3
Sampling duration (intended)	5min	5min	5min

Associated ambient air sample ID N/A Depth of sample point below grade

Analytical method required TO-15 Laboratory used

Tubing type/inside dia. used 3/8 OD Length of tubing 8' / 13' / 18' cm Tubing volume S 77 / M 125 / D 173 cc

Volume purged 230 S / 375 M / 500 D cc @ 0.1 l/min (100cc/min) 3 volumes purged @ < 200cc/min? S Yes / M Yes / D Yes

Shroud tracer gas conc. Beginning: 59.4% End of purging: S 0 / M 0 / D 0 End of sampling: 23%

Gas Analyzer Readings $\%O_2$ N/A $\%CO_2$ N/A $\%CH_4$ N/A (PID)/FID reading S 0.3 / M 0.5 / D 0.5 (ppmv)

Noticeable odor No / No / No Soil type clay

Weather Conditions during Probe Installation:

Air temperature (°F) _____ Rainfall _____ Wind direction _____

Barometric pressure _____ Wind speed (mph) _____

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Weather Conditions at Start of Sampling:

Air temperature (°F) 49 Rainfall No Wind direction N

Barometric pressure 30.20 in Wind speed (mph) 4 mph

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments: VP-4M water in line

VP-4S / VP-4D Stalled

Soil Vapor (Bottle Vac®) Sample Collection Field Form

Project # 68595 Date 10/25/18

Project Name Coldwater Rd Collector KBS

DUP-1 = VP-5S
10/25 1125 1146
BID - 23690
FC - N/A
start -29
end -4

Sample ID	VP-5S	VP-5M	VP-5D	DUP-1 (VP-5S)	VP-5M
Start Date/Time	10/25 1125	10/25 1126	10/25 1128	Vacuum gauge "zero" ("Hg)	No-2
End Date/Time	1147 1147	1145	1150	Start Pressure ("Hg)	-29
Bottle/Canister ID	12439	12430	12433	End Pressure ("Hg)	-4
Flow controller ID	107	28	129	End pressure = "zero"?	-2
Associated ambient air sample ID	N/A			Sampling duration (intended)	
Analytical method required	TO-15			Depth of sample point below grade	
				Laboratory used	

VP-5S -28 -25 0

Tubing type/inside dia. used 3/8 OD Length of tubing S 8' | M 13' | D 8' cm Tubing volume S 77 cc | M 125 cc | D 173 cc

Volume purged S 230 cc | M 520 cc | D 520 cc @ 0.1 l/min (100cc/min) 3 volumes purged @ < 200cc/min? Yes / Yes / Yes

Shroud tracer gas conc.: Beginning: 65.5% End of purging: S 75ppm | M 50ppm | D 75ppm End of sampling: 14.9%

Gas Analyzer Readings %O_2 N/A %CO_2 N/A %CH_4 S 50 N/A D 50 PID/FID reading S 10 0.1 | M 0.5 0.6 | D 0.6 0.0 (ppmv)

Noticeable odor S No | M No | D No Soil type clay

Weather Conditions during Probe Installation:

Air temperature (°F) _____ Rainfall _____ Wind direction _____

Barometric pressure _____ Wind speed (mph) _____

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Weather Conditions at Start of Sampling:

Air temperature (°F) 38°F Rainfall None Wind direction N

Barometric pressure 30.30 in Wind speed (mph) 1 mph

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

No

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments: Sample Tee #2 used for DUP

Soil Vapor (Bottle Vac®) Sample Collection Field Form

Project # 68545 Date 10/25/18

Project Name Coldwater Collector KBS

Sample ID	VP-6S	VP-6M	VP-6D
Start Date/Time	10/25 1321	10/25 1323	10/25 1325
End Date/Time	1327	1335	1332
Bottle/Canister ID	18396	12434	16831
Flow controller ID	156	36	149

Vacuum gauge "zero" ("Hg")	VP-6S NO -4	VP-6M -2	VP-6D -4
Start Pressure ("Hg")	-26	-29	-30
End Pressure ("Hg")	-4	-2	-5
End pressure = "zero"?	0	-2	-4
Sampling duration (intended)			
Depth of sample point below grade			

Associated ambient air sample ID N/A

Analytical method required TO-15 Laboratory used

Tubing type/inside dia. used 3/8 OD Length of tubing 8'/13'/18' cm Tubing volume S 27 / M 125 / D 173 cc

Volume purged S 230 / M 375 / D 520 cc @ 0.1 l/min (100cc/min) 3 volumes purged @ < 200cc/min? Yes / Yes / Yes

Shroud tracer gas conc. Beginning: 68.9% End of purging: S 0 / M 0 / D 0 End of sampling: 40.1%

Gas Analyzer Readings %O_2 N/A %CO_2 N/A %CH_4 N/A PID/FID reading S 0.7 / M 0.6 / D 0.5 (ppmv)

Noticeable odor S No / M No / D No Soil type Clay 0 / 0.3 / 0

Weather Conditions during Probe Installation:

Air temperature (°F) _____ Rainfall _____ Wind direction _____

Barometric pressure _____ Wind speed (mph) _____

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Weather Conditions at Start of Sampling:

Air temperature (°F) ~48 Rainfall No Wind direction NW

Barometric pressure 30.27 Wind speed (mph) 3 mph

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments:

ATTACHMENT C

Analytical Laboratory Results

Analytical Laboratory Report

Report ID: S96055.01(01)
Generated on 11/02/2018

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 E Saginaw St
East Lansing, MI 48823

Phone: 248-477-5701 FAX:
Email: Clifford.Yantz@obg.com

Report produced by

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

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

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

Report Summary

Lab Sample ID(s): S96055.01-S96055.10
Project: RACER Coldwater Rd - VP
Collected Date: 10/25/2018
Submitted Date/Time: 10/26/2018 14:00
Sampled by: Kevin Schneider
P.O. #: PO

Table of Contents

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

Report Narrative

Samples .03, .08, .09, and .10 not run due to water in canister upon receipt

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
TO-15	EPA TO-15 Second Edition January 1999

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S96055.01	VP-5S	Air	10/25/18 11:25 - 10/25/18 11:47
S96055.02	VP-5M	Air	10/25/18 11:26 - 10/25/18 11:45
S96055.03	VP-5D	Air	10/25/18 11:28 - 10/25/18 11:50
S96055.04	DUP-1	Air	10/25/18 00:01 - 10/25/18 00:02
S96055.05	VP-6S	Air	10/25/18 13:21 - 10/25/18 13:27
S96055.06	VP-6D	Air	10/25/18 13:25 - 10/25/18 13:32
S96055.07	VP-6M	Air	10/25/18 13:23 - 10/25/18 13:35
S96055.08	VP-4M	Air	10/25/18 14:25 - 10/25/18 14:41
S96055.09	VP-4D	Air	10/25/18 14:27 - 10/25/18 15:03
S96055.10	VP-4S	Air	10/25/18 14:23 - 10/25/18 15:23

Lab Sample ID: S96055.01
Sample Tag: VP-5S
Collected Date/Time: 10/25/2018 11:25 - 10/25/2018 11:47
Matrix: Air
COC Reference: A01701

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 10/30/18 01:40, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	2		ppbv	10	106-99-0	
Benzene	Not detected	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	24	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	2		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	2		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	25		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	10		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	2	2		ppbv	10	110-54-3	

Lab Sample ID: S96055.01 (continued)
Sample Tag: VP-5S

TO-15, Method: TO-15, Run Date: 10/30/18 01:40, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	10		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	5		ppbv	10	115-07-1	X
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	4	2		ppbv	10	109-99-9	
Toluene	10	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	Not detected	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 10/30/18 01:40, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	4.4		ug/m3	10	106-99-0	
Benzene	Not detected	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	75	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	5.3		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	4.1		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S96055.01 (continued)
Sample Tag: VP-5S

TO-15, Method: TO-15, Run Date: 10/30/18 01:40, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	47		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	36		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	7.0	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	29		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	8.6		ug/m3	10	115-07-1	X
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	12	5.9		ug/m3	10	109-99-9	
Toluene	38	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	Not detected	17		ug/m3	10		

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S96055.01 (continued)
Sample Tag: VP-5S

TO-15, Method: TO-15, Run Date: 10/30/18 01:40, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	

Lab Sample ID: S96055.02
Sample Tag: VP-5M
Collected Date/Time: 10/25/2018 11:26 - 10/25/2018 11:45
Matrix: Air
COC Reference: A01701

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 10/30/18 02:11, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	2		ppbv	10	106-99-0	
Benzene	3	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	93	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	2		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	2		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	25		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	10		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	5	2		ppbv	10	110-54-3	

Lab Sample ID: S96055.02 (continued)
Sample Tag: VP-5M

TO-15, Method: TO-15, Run Date: 10/30/18 02:11, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	10		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	36		ppbv	10	115-07-1	X
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	3	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	5	2		ppbv	10	109-99-9	
Toluene	12	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	5	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 10/30/18 02:11, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	4.4		ug/m3	10	106-99-0	
Benzene	9.6	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	290	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	5.3		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	4.1		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S96055.02 (continued)
Sample Tag: VP-5M

TO-15, Method: TO-15, Run Date: 10/30/18 02:11, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	47		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	36		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	18	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	29		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	62		ug/m3	10	115-07-1	X
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	14	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	15	5.9		ug/m3	10	109-99-9	
Toluene	45	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	22	17		ug/m3	10		

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S96055.02 (continued)

Sample Tag: VP-5M

TO-15, Method: TO-15, Run Date: 10/30/18 02:11, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	

Lab Sample ID: S96055.03
Sample Tag: VP-5D
Collected Date/Time: 10/25/2018 11:28 - 10/25/2018 11:50
Matrix: Air
COC Reference: A01701

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Other / Misc.

Method: , Run Date: 10/29/18 10:18, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Lab Sample ID: S96055.04
Sample Tag: DUP-1
Collected Date/Time: 10/25/2018 00:01 - 10/25/2018 00:02
Matrix: Air
COC Reference: A01701

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 10/30/18 02:43, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	2		ppbv	10	106-99-0	
Benzene	Not detected	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	25	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	2		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	2		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	25		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	10		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	2	2		ppbv	10	110-54-3	

Lab Sample ID: S96055.04 (continued)
Sample Tag: DUP-1

TO-15, Method: TO-15, Run Date: 10/30/18 02:43, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	10		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	4		ppbv	10	115-07-1	X
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	4	2		ppbv	10	109-99-9	
Toluene	10	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	Not detected	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 10/30/18 02:43, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	4.4		ug/m3	10	106-99-0	
Benzene	Not detected	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	78	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	5.3		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	4.1		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S96055.04 (continued)
Sample Tag: DUP-1

TO-15, Method: TO-15, Run Date: 10/30/18 02:43, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	47		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	36		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	7.0	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	29		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	6.9		ug/m3	10	115-07-1	X
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	12	5.9		ug/m3	10	109-99-9	
Toluene	38	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	Not detected	17		ug/m3	10		

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S96055.04 (continued)

Sample Tag: DUP-1

TO-15, Method: TO-15, Run Date: 10/30/18 02:43, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	

Lab Sample ID: S96055.05
Sample Tag: VP-6S
Collected Date/Time: 10/25/2018 13:21 - 10/25/2018 13:27
Matrix: Air
COC Reference: A01701

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 10/30/18 03:14, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	2		ppbv	10	106-99-0	
Benzene	Not detected	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	44	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	2		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	2		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	25		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	10		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	3	2		ppbv	10	110-54-3	

Lab Sample ID: S96055.05 (continued)
Sample Tag: VP-6S

TO-15, Method: TO-15, Run Date: 10/30/18 03:14, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	10		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	9		ppbv	10	115-07-1	X
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	4	2		ppbv	10	109-99-9	
Toluene	5	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	Not detected	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 10/30/18 03:14, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	4.4		ug/m3	10	106-99-0	
Benzene	Not detected	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	140	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	5.3		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	4.1		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S96055.05 (continued)
Sample Tag: VP-6S

TO-15, Method: TO-15, Run Date: 10/30/18 03:14, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	47		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	36		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	11	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	29		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	15		ug/m3	10	115-07-1	X
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	12	5.9		ug/m3	10	109-99-9	
Toluene	19	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	Not detected	17		ug/m3	10		

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S96055.05 (continued)

Sample Tag: VP-6S

TO-15, Method: TO-15, Run Date: 10/30/18 03:14, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	

Lab Sample ID: S96055.06
Sample Tag: VP-6D
Collected Date/Time: 10/25/2018 13:25 - 10/25/2018 13:32
Matrix: Air
COC Reference: A01701

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 10/30/18 03:46, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	2		ppbv	10	106-99-0	
Benzene	Not detected	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	Not detected	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	2		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	2		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	25		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	10		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	Not detected	2		ppbv	10	110-54-3	

Lab Sample ID: S96055.06 (continued)
Sample Tag: VP-6D

TO-15, Method: TO-15, Run Date: 10/30/18 03:46, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	10		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	2		ppbv	10	115-07-1	
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	2	2		ppbv	10	109-99-9	
Toluene	3	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	Not detected	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 10/30/18 03:46, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	4.4		ug/m3	10	106-99-0	
Benzene	Not detected	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	Not detected	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	5.3		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	4.1		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	

Lab Sample ID: S96055.06 (continued)
Sample Tag: VP-6D

TO-15, Method: TO-15, Run Date: 10/30/18 03:46, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	47		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	36		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	Not detected	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	29		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	3.4		ug/m3	10	115-07-1	
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	5.9	5.9		ug/m3	10	109-99-9	
Toluene	11	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	Not detected	17		ug/m3	10		
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	

Lab Sample ID: S96055.07
Sample Tag: VP-6M
Collected Date/Time: 10/25/2018 13:23 - 10/25/2018 13:35
Matrix: Air
COC Reference: A01701

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 10/30/18 04:17, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	2		ppbv	10	106-99-0	
Benzene	Not detected	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	80	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	2		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	2		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	25		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	10		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	Not detected	2		ppbv	10	110-54-3	

Lab Sample ID: S96055.07 (continued)
Sample Tag: VP-6M

TO-15, Method: TO-15, Run Date: 10/30/18 04:17, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	10		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	7		ppbv	10	115-07-1	X
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	3	2		ppbv	10	109-99-9	
Toluene	4	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	Not detected	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 10/30/18 04:17, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	4.4		ug/m3	10	106-99-0	
Benzene	Not detected	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	250	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	5.3		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	4.1		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S96055.07 (continued)
Sample Tag: VP-6M

TO-15, Method: TO-15, Run Date: 10/30/18 04:17, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	47		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	36		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	Not detected	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	29		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	12		ug/m3	10	115-07-1	X
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	8.8	5.9		ug/m3	10	109-99-9	
Toluene	15	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	Not detected	17		ug/m3	10		

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S96055.07 (continued)

Sample Tag: VP-6M

TO-15, Method: TO-15, Run Date: 10/30/18 04:17, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	

Lab Sample ID: S96055.08
Sample Tag: VP-4M
Collected Date/Time: 10/25/2018 14:25 - 10/25/2018 14:41
Matrix: Air
COC Reference: A01701

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Other / Misc.

Method: , Run Date: 10/29/18 10:18, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Lab Sample ID: S96055.09
Sample Tag: VP-4D
Collected Date/Time: 10/25/2018 14:27 - 10/25/2018 15:03
Matrix: Air
COC Reference: A01701

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Other / Misc.

Method: , Run Date: 10/29/18 10:18, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Lab Sample ID: S96055.10
Sample Tag: VP-4S
Collected Date/Time: 10/25/2018 14:23 - 10/25/2018 15:23
Matrix: Air
COC Reference: A01701

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Other / Misc.

Method: , Run Date: 10/29/18 10:18, Analyst: SRS

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hold until notified*	Completed				1		

Merit Laboratories Login Checklist

Lab Set ID: S96055
Client: OBG02 (O'Brien & Gere Engineers, Inc.)
Project: RACER Coldwater Rd - VP
Submitted: 10/26/2018 14:00 Login User: SRS

Attention: Clifford Yantz
Address: O'Brien & Gere Engineers, Inc.
2260 E Saginaw St
East Lansing, MI 48823

Phone: 248-477-5701 FAX:
Email: Clifford.Yantz@obg.com

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

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.

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

C.O.C. PAGE # 1 OF 1

A 01701

AIR/GAS SAMPLES CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Clifford Yantz
COMPANY: O'Brien & Gere
ADDRESS: 2260 East Saginaw
CITY: East Lansing STATE: MI ZIP CODE: 48823
PHONE NO.: 313-333-0211 FAX NO.: P.O. NO.:
EMAIL ADDRESS: clifford.yantz@obg.com QUOTE NO.:

INVOICE TO

X SAME

CONTACT NAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. EMAIL ADDRESS

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME: RACER Coldwater Rd - VP
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Chris Schneider

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

DELIVERABLES REQUIRED X LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

Certifications
☐ OHIO VAP ☐ NELAP
☐ DoD ☐ NPDES

MERIT LAB NO. FOR LAB USE ONLY	SAMPLE TAG IDENTIFICATION-DESCRIPTION	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	Sample Type: Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (specify in notes)	Analyses: TO-15	Other (specify in notes)
960551.01	VP-5S	10/25/18	1125	1147	-29	-4	107	12439			X			X	
.02	VP-5M		1126	1145	-30	-3	28	12430			X			X	
.03	* VP-5D		1128	1150	-28.5	-25	129	12433			X			X	
.04	DUP-1		—	—	-29	-4	N/A	23690			X			X	
.05	VP-6S		1321	1327	-26	-4	156	18396			X			X	
.06	VP-6D		1325	1332	-30	-5	149	16831			X			X	
.07	VP-6M		1323	1335	-29	-2	36	12434			X			X	
.08	* VP-4M		1425	1441	-30	-30	53	16893			X			X	
.09	* VP-4D		1427	1503	-30	-27	47	12447			X			X	
.10	* VP-4S		1423	1523	-30	-23	105	13742			X			X	

Temperature (Fahrenheit)	Interior	Ambient	Notes
Start		38°F	
Stop		49°F	

Pressure (inches of Hg)	Interior	Ambient	Notes
Start		30.30 in	
Stop		30.20 in	

Notes: * stalled - water in line

RELINQUISHED BY: SIGNATURE/ORGANIZATION: OBG X Sampler DATE: 10/26/18 TIME: 1233
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 10/26/18 TIME: 12:33
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: 10/26/18 TIME: 14:00
RECEIVED BY: SIGNATURE/ORGANIZATION: DATE: 10/26/18 TIME: 1402

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

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

NOTES: TEMP. ON ARRIVAL RT

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