

Memo

**SUBJECT**

Off-Site Monitoring Well Memo
Ford Livonia Transmission Plant
36200 Plymouth Road, Wayne County, Michigan
EGLE Site ID No.: 82002970

TO

Brandon Alger
EGLE Warren District Office
27700 Donald Court
Warren, Michigan 48092-2793
balger@michigan.gov

DATE

July 28, 2021

OUR REF

30080642

DEPARTMENT

ENVIRONMENT

NAME

Kris Hinskey
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COPIES TO

Ms. Paul Owens, EGLE
Mr. Beth Vens, EGLE
Mr. Todd Walton, Ford
Mr. Chuck Pinter, Ford

On behalf of Ford Motor Company (Ford), this memo has been prepared by Arcadis of Michigan, LLC for the Livonia Transmission Plant (LTP) site (Site) located at 36200 Plymouth Road in Livonia, Michigan. This memo provides a summary of the investigation work that was recently completed south of Plymouth Road, as proposed in the *Off-Site Vertical Aquifer Profile (VAP) Investigation Work Plan* submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on February 26, 2021. As requested by EGLE, this VAP investigation was completed to the south and east of the Site to collect additional data to confirm the current conceptual site model. All work was performed under the guidance of EGLE in compliance with the Consent Decree filed on July 27, 2017 (No: 2:1712372-GAD-RSW).

On September 25, 2020, EGLE contacted Ford via email requesting the installation of up to 10 shallow off-site monitoring wells to monitor the groundwater table. The investigative borings requested by EGLE are located south of Plymouth Road and east of Stark Road and were part of the *Groundwater Modeling Summary* provided by Weston Solutions dated May 2020.

On November 18, 2020, EGLE contacted Ford via email and requested that Ford investigate proposed locations 1 through 8 using VAP prior to potentially installing permanent monitoring wells. Locations 9 and 10 would only be investigated pending the groundwater analytical results from locations 1 and 2. The new VAP boring (renamed to VAP-53 through VAP-60) locations are shown on **Figure 1**. The final placement of the boring locations was dependent on utilities, to accommodate accessibility during installation, and reduce potential disruption to nearby residences.

This memo documents the analytical results for the groundwater samples that have been collected off-site south of Plymouth Road during the June 2021 VAP investigation.

Off-Site Investigation Activities

On June 14-17, 2021, Arcadis installed VAP borings in the City of Livonia Right-of-Ways (ROW) at locations generally consistent with locations 1A through 8A and collected groundwater samples from four (4) off-site locations south of Plymouth Road (VAP-53, VAP-54, VAP-55, and VAP-56) (**Figure 1**). Four (4) additional borings were completed (VAP-57, VAP-58, VAP-59, and VAP-60) but groundwater samples were unable to be collected due to the borehole being dry and not producing enough groundwater to collect a sample.

Investigation activities were completed as follows:

- Continuous soil cores were obtained from the ground surface to the basal clay unit using direct push drilling rig (DPT) equipped with dual-tube tooling. Arcadis staff logged and described the soils in accordance with the Arcadis Soil Description Technical Guidance Instruction. Boring logs have been generated based on the field descriptions and are included in **Attachment 1**.
- Groundwater sampling was collected as grab samples and completed using a screen point sampling device approximately 4 feet in length. Groundwater samples were collected bottom-up, starting with the deepest interval and finish with the shallowest interval.
- Up to three (3) VAP groundwater samples were collected at each boring location, based on production/availability. Sampling intervals were biased to the more permeable intervals identified on the soil boring log.
- Following completion, the boring was allowed to naturally collapse, and any remaining void space was backfilled with bentonite pellets. The surface at each boring was finished with material similar to the surrounding surface (soil, asphalt, concrete, etc.).

Sampling Methodology

At each of the borings where groundwater samples were collected the following methodology was utilized:

- Drill rods were advanced to the target depth interval identified from the soil boring. Once the target depth interval was reached, the screen point sampler was deployed by retracting the drill rods.
- Groundwater was purged for approximately 15 minutes or until visually clear and grab groundwater samples were collected via a peristaltic pump from each of the selected intervals.
- Samples were submitted to TestAmerica, located in North Canton, Ohio and analyzed for the 7 constituents of concern (COCs): tetrachloroethene [PCE], trichloroethene [TCE], 1,1-dichloroethene [1,1-DCE], cis-1,2-dichloroethene [cis-1,2-DCE], trans-1,2-dichloroethene [trans-1,2-DCE], vinyl chloride [VC], and 1,4-dioxane [1,4-D] via USEPA Method 8260 and 8260 SIM.
- All samples were collected in accordance with the approved Quality Assurance Project Plan (QAPP).

Analytical Results

Results of the groundwater samples collected onsite during the June 14-15, 2021, event were compared to the EGLE residential drinking water (DC) criteria and the residential volatilization to indoor air (VIAC) groundwater in contact (GWIC) criteria. All analytical results from the samples collected during this investigation have non-detect results (results below the reporting limit) for all COCs. All analytical results and applicable comparison criteria are summarized in **Table 1** and laboratory reports are provided in **Attachment 2**.

Paul Owens, District Supervisor
EGLE Warren District Office
July 28, 2021

Closing

All samples that have been collected are in accordance with the RespAPs approved by EGLE and the groundwater analytical data has been validated for quality assurance. At this time, no further investigation work (i.e., installation of permanent monitoring wells) is proposed south of Plymouth Road. In the event that conditions change along the southern boundary of the Site, Ford and Arcadis will continue to have discussions with EGLE to determine the next steps. If you have questions, please contact Kris Hinskey by email at Kristoffer.Hinskey@arcadis.com or by phone at 248-994-2240.

Figures

Figure 1 – Vertical Aquifer Profile Boring Locations

Tables

Table 1 – 2021 Summary of Off-Site Vertical Aquifer Profile Analytical Results

Attachments

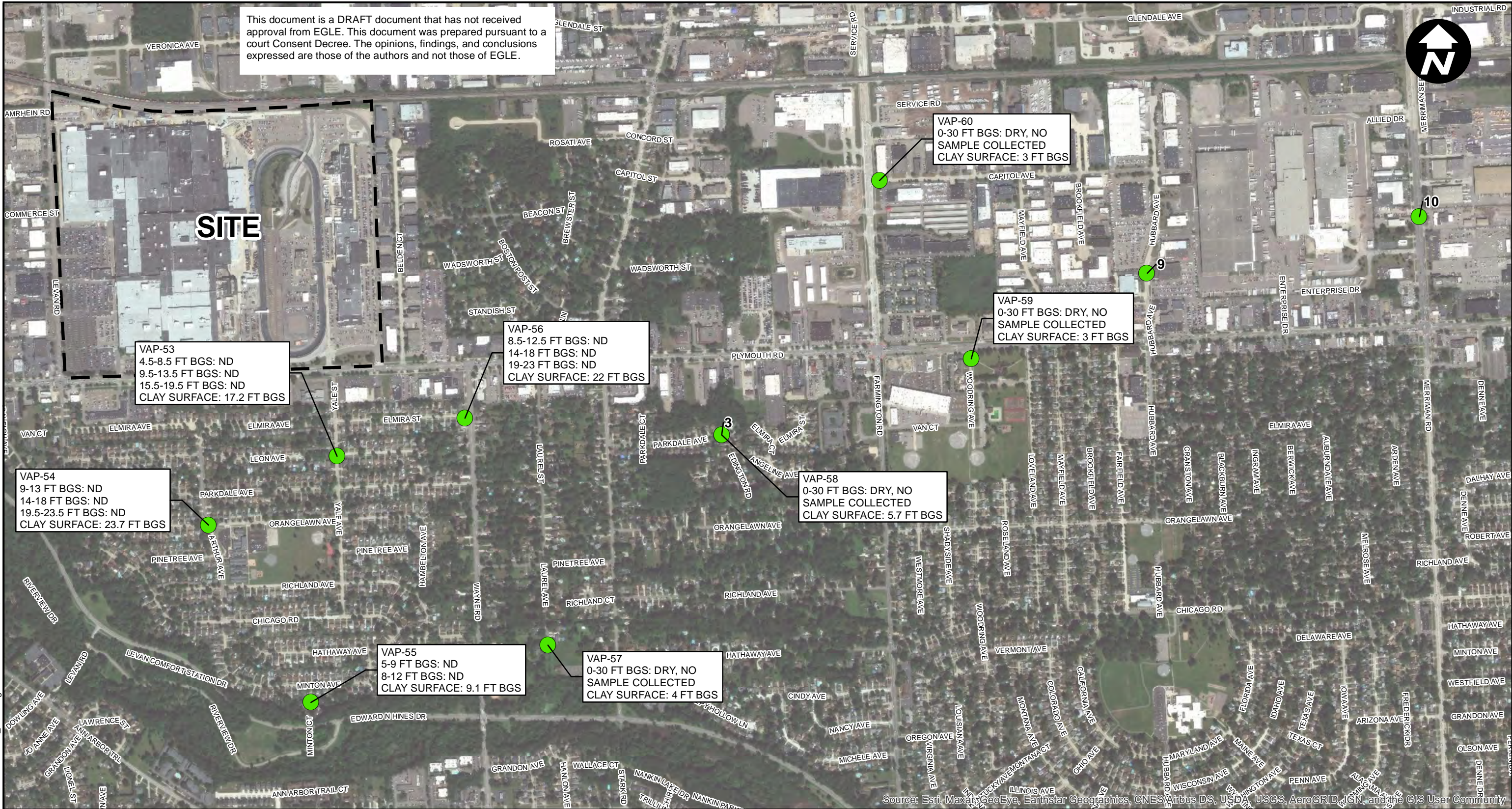
Attachment 1 – Soil Boring Logs

Attachment 2 – Laboratory Analytical Reports

Figure 1

Vertical Aquifer Profile Boring Locations

This document is a DRAFT document that has not received approval from EGLE. This document was prepared pursuant to a court Consent Decree. The opinions, findings, and conclusions expressed are those of the authors and not those of EGLE.



CITY: Novi DIV: ENV DB: MG PIC: R. ELLIS PM: K. HINSKEY PROJECT NUMBER: 30080642 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet T:\ENVI\Novi\Brighton_MIFord\Livonia\GIS\docs\GEC\ZQ_2021\Figure 1 - VERTICAL AQUIFER PROFILE.mxd PLOTTED: 7/16/2021 6:34:48 PM BY: ma00749

LEGEND

- ARCADIS VERTICAL AQUIFER PROFILE BORING LOCATION
- FORD PROPERTY BOUNDARY

- NOTES:**
1. ALL SAMPLES COLLECTED BETWEEN JUNE 14 THROUGH JUNE 17, 2021.
 2. EGLE = MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
 3. FT BGS = FEET BELOW GROUND SURFACE
 4. ND = NON-DETECT, RESULT BELOW LABORATORY REPORTING LIMIT
 5. VAP = VERTICAL AQUIFER PROFILE



<p>FORD MOTOR COMPANY LIVONIA TRANSMISSION PLANT LIVONIA, MICHIGAN</p>	
<p>VERTICAL AQUIFER PROFILE BORING LOCATIONS</p>	
	<p>FIGURE 1</p>

Table 1

2021 Summary of Off-Site Vertical Aquifer Profile Analytical Results

Location:	Screen Interval (ft. bgs):	Sample Date:	Sample ID:	Unit	Residential DW Criteria	Residential VIAC GWIC Criteria	VAP-53 4.5-8.5 6/14/2021 VAP-53_4.5-8.5_061421	VAP-53 9.5-13.5 6/14/2021 VAP-53_9.5-13.5_061421	VAP-53 15.5-19.5 6/14/2021 VAP-53_15.5-19.5_061421	VAP-54 9-13 6/14/2021 VAP-54_9-13_061421	VAP-54 14-18 6/14/2021 VAP-54_14-18_061421	VAP-54 19.5-23.5 6/14/2021 VAP-54_19.5-23.5_061421	VAP-55 5-9 6/15/2021 VAP-55_5-9_061521	VAP-55 8-12 6/15/2021 VAP-55_8-12_061521	VAP-56 8.5-12.5 6/14/2021 VAP-56_8.5-12.5_061521	VAP-56 14-18 6/15/2021 VAP-56_14-18_061521	VAP-56 19-23 6/15/2021 VAP-56_19-23_061521	
Semi-volatile Organic Compounds (SVOCs)																		
1,4-Dioxane	µg/L	7.2*	1,900	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Volatile Organic Compounds (VOCs)																		
1,1-Dichloroethene	µg/L	7.0	18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]
cis-1,2-Dichloroethene	µg/L	70	3.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]
Tetrachloroethene	µg/L	5.0	1.5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]
trans-1,2-Dichloroethene	µg/L	100	13	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]
Trichloroethene	µg/L	1.0**	1.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]
Vinyl chloride	µg/L	1.0**	1.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 [< 1.0]

Notes:
 Results are compared to EGLE Part 201 Generic Cleanup Criteria, June 2018.
 * Residential Drinking Water Criteria for 1,4-dioxane is derived from EGLE Proposed Rule Changes (September 2016) and Emergency Rules (October 27, 2016).
 ** Groundwater results for Trichloroethene and Vinyl Chloride are compared to the published EGLE Remediation and Redevelopment Division Target Detection Limit of 1.0 µg/l.
Bolded Result exceeds Residential Drinking Water (DW) Criteria
Italics Result exceeds Residential Volatilization to Indoor Air (VIAC) Groundwater In Contact (GWIC) Criteria
 < Result not detected above reporting limit.

Abbreviations:
 EGLE Michigan Department of Environment, Great Lakes, and Energy
 µg/L micrograms per liter
 ft. bgs feet below ground surface
 J estimated result
 VAP vertical aquifer profiling

Analytical Methods:
 Method 8260B SIM used for Semi-volatile Organic Compounds (SVOCs)
 Method 8260B used for Volatile Organic Compounds (VOCs)

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Attachment 1

Soil Boring Logs

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/14/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/14/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 63° F, Sunny, Rain

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
0.0							(0.0-0.2') TOPSOIL/GRASS.		
1							(0.2-5.0') SAND, fine to medium, subrounded to subangular; trace pebbles, small, subrounded to subangular; well sorted; dry; yellowish brown (10YR 5/4).		
2									
3			60				Note: Color change to very pale brown (10YR 7/3) at 3.0' bgs.		
4									
5									
6				VAP-53_4.5-8.5 _061421 @ 11:10			(5.0-6.2') SAND, medium to coarse, subrounded to subangular; trace pebbles, small, subrounded to subangular; well sorted; moist to wet; brown (10YR 5/3). Note: Boring appears wet at 5.5' bgs.		
7							(6.2-8.0') SAND, very fine to fine; some silt; well sorted; wet; grayish brown (10YR 5/2).		
8			54						
9							(8.0-8.7') SAND, fine to medium, subrounded to subangular; some sand, coarse, subrounded to subangular; well sorted; wet; grayish brown (10YR 5/2). Note: Grain size coarsens downward.		
10							(8.7-9.0') CLAY, high plasticity, slow dilatancy; little silt; wet; soft; dark gray (10YR 4/1).		
11				VAP-53_9.5-13.5 _061421 @ 10:55			(9.0-14.2') SAND, fine to medium, subrounded to subangular; trace pebbles, small, subrounded to subangular; well sorted; wet; gray (10YR 6/1).	(0.0-30.0') Bentonite Backfill.	
12									
13			46						
14									
15							(14.2-17.2') SILT, nonplastic, rapid dilatancy; little to trace sand, fine; wet; soft; gray (10YR 6/1).		
16									
17				VAP-53_15.5-19.5 _061421 @ 10:35					
18							(17.2-30.0') CLAY, high plasticity, slow dilatancy; some silt; trace pebbles, small, subrounded to subangular; moist; soft; gray (10YR 5/1).		
19			60						
20									

Drilling Co.: Fibertec Sampling Method: 5' Macrocore
 Driller: Rhex Moore Sampling Interval: Continuous
 Drilling Method: Hand Auger / Direct Push Water Level Start (ft. bgs.): 5.5
 Drilling Fluid: None Water Level Finish (ft. btoc.): 17.2
 Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface. Converted to Well: Yes No
Hand Auger to 5.0' bgs. Surface Elev.: _____
 North Coor.: _____
 East Coor.: _____

SOIL BORING LOG - 2013 V:\ARCADIS\US\COM\OFFICE\DATA\NOV\11\COMMON\FORD\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ - ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/14/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/14/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 63° F, Sunny, Rain

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	X		29		0.0	/	(17.2-30.0') CLAY, high plasticity, slow dilatancy; some silt; trace pebbles, small, subrounded to subangular; moist; soft; gray (10YR 5/1).		
22					0.0				
23					0.0				
24					0.0				
25					0.0				
26	X		32		0.0	/	End of boring at 30.0' bgs.	(0.0-30.0') Bentonite Backfill.	
27					0.0				
28					0.0				
29					0.0				
30					0.0				
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks: VAP Samples Collected on 6/14/21: 4.5-8.5' bgs at 11:10; 9.5-13.5' bgs at 10:55, 15.5-19.5' bgs at 10:35.

SOIL BORING LOG - 2013 V:\ARCADIS\US\COM\OFFICE\DATA\NOV\11\COMMON\FORD\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ - ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/14/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/14/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 70° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.0		(0.0-0.2') TOPSOIL/GRASS.	(0.0-30.0') Bentonite Backfill.	
2					0.0		(0.2-3.0') SAND, fine to medium, subrounded to subangular; little to trace pebbles, small to medium, subrounded to subangular; well sorted; dry; yellowish brown (10YR 5/4).		
3			72		0.0				
4					0.0		(3.0-9.0') SAND, fine to medium, subrounded to subangular; well sorted; dry to moist; very pale brown (10YR 7/3).		
5					0.0				
6					0.0				
7					0.0				
8			45		0.0				
9					0.0		(9.0-9.2') SAND, very fine to fine; some silt; well sorted; wet; brown (10YR 5/3).		
10					0.0		(9.2-10.3') SAND, fine to medium, subrounded to subangular; little sand, coarse, subrounded to subangular; well sorted; wet; brown (10YR 4/3).		
11				VAP-54_9-13 _061421 @ 15:10	0.0		(10.3-12.9') SAND, very fine to fine; some silt; well sorted; wet; brown (10YR 4/3) to gray (10YR 6/1).		
12			57		0.0				
13					0.0		(12.9-13.0') CLAY, high plasticity, slow dilatancy; little silt; wet; soft; gray (10YR 6/1).		
14					0.0		(13.0-14.5') SAND, very fine to fine; some silt; well sorted; wet; gray (10YR 6/1).		
15					0.0		(14.5-15.0') CLAY, high plasticity, slow dilatancy; little silt; wet; soft; gray (10YR 6/1).		
16				VAP-54_14-18 _061421 @ 14:45	0.0		(15.0-21.5') SAND, very fine to fine; some silt; well sorted; wet; gray (10YR 6/1).		
17			55		0.0		Note: Small ~1.0" thick seam of medium plasticity clay at 16.5' bgs.		
18					0.0				
19					0.0		Note: Small ~1.0" thick seam of medium plasticity clay at 18.5' bgs.		
20					0.0				

Drilling Co.: Fibertec Sampling Method: 5' Macrocore
 Driller: Rhex Moore Sampling Interval: Continuous
 Drilling Method: Hand Auger / Direct Push Water Level Start (ft. bgs.): 9.0
 Drilling Fluid: None Water Level Finish (ft. btoc.): 24.5
 Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface. Converted to Well: Yes No
Hand Auger to 5.0' bgs. Surface Elev.: _____
 North Coor.: _____
 East Coor.: _____

SOIL BORING LOG - 2013 V:\ARCADIS\US\COM\OFFICE\DATA\NOV\HMC\COMMON\FORD\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ / ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/14/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/14/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 70° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	X		51	VAP-54_19.5-23.5 _061421 @ 14:25	0.0		(15.0-21.5') SAND, very fine to fine; some silt; well sorted; wet; gray (10YR 6/1).	(0.0-30.0') Bentonite Backfill.	
22					0.0		(21.5-21.6') CLAY, high plasticity, rapid dilatancy; some silt; wet; soft; gray (10YR 5/1).		
23					0.0		(21.6-22.5') SAND, medium to coarse, subrounded to subangular; trace pebbles, small, subrounded to subangular; well sorted; wet; gray (10YR 5/1).		
24					0.0		(22.5-23.7') SILT, low plasticity, rapid dilatancy; some sand, very fine to fine; trace clay; wet; soft; gray (10YR 5/1).		
25					0.0		(23.7-30.0') CLAY, high plasticity, slow dilatancy; little silt; trace pebbles, small, subrounded to subangular; moist; soft; gray (10YR 5/1). Note: Small ~2.0" thick seam of low plasticity silt at 24.0' and 24.4' bgs. Borehole is dry from 24.5-30.0' bgs.		
26	X		24		0.0				
27					0.0				
28					0.0				
29					0.0				
30					0.0				
31							End of boring at 30.0' bgs.		
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks: VAP Samples Collected on 6/14/21: 9.0-13.0' bgs at 15:10; 14.0-18.0' bgs at 14:45, 19.5-23.5' bgs at 14:25.

SOIL BORING LOG - 2013 V:\ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOM\MON\FORD\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ - ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/15/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/15/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 64° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.0	(0.0-0.3') TOPSOIL/GRASS.			
2					0.0	(0.3-1.0') SAND, very fine to fine; little silt; well sorted; dry; light gray (10YR 7/2).			
3			72		0.0	(1.0-4.0') SAND, fine to medium, subrounded to subangular; trace pebbles, small to medium, subrounded to subangular; well sorted; dry; yellowish brown (10YR 5/6).			
4					0.0				
5					0.0	(4.0-6.3') SAND, very fine to fine; some silt; trace clay; well sorted; dry to wet; pale brown (10YR 6/3).			
6					0.0				
7				VAP-55_5-9 _061521 @ 10:45	0.0	Note: Boring appears wet at 6.2' bgs. (6.3-7.5') CLAY, medium plasticity, slow dilatancy; little silt; wet; soft; brown (10YR 5/3).			
8			48		0.0	(7.5-8.8') SILT, nonplastic, rapid dilatancy; some sand, very fine to fine; wet; soft; gray (10YR 6/1).			
9					0.0				
10				VAP-55_8-12 _061521 @ 09:55	0.0	(8.8-9.1') SAND, fine to coarse, subrounded to subangular; trace pebbles, small, subrounded to subangular; poorly sorted; wet; very dark gray (10YR 3/1).			
11					0.0	(9.1-25.0') CLAY, high plasticity, no dilatancy; trace sand, medium, subrounded to subangular; trace pebbles, small, subrounded to subangular; moist to dry; soft to medium stiff; gray (10YR 5/1).		(0.0-25.0') Bentonite Backfill.	
12			53		0.0				
13					0.0				
14					0.0				
15					0.0				
16					0.0				
17					0.0				
18			48		0.0				
19					0.0				
20					0.0				

Drilling Co.: Fibertec Sampling Method: 5' Macrocore
 Driller: Rhex Moore Sampling Interval: Continuous
 Drilling Method: Hand Auger / Direct Push Water Level Start (ft. bgs.): 6.2
 Drilling Fluid: None Water Level Finish (ft. btoc.): 10
 Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface. Converted to Well: Yes No
Hand Auger to 5.0' bgs. Surface Elev.: _____
 North Coor.: _____
 East Coor.: _____

SOIL BORING LOG - 2013 VARCADIS-US-COM-OFFICE-DATA-NOV-11-MICOMMON-FORD-LIVONIA-03-NOTES-AND-DATA-BORING-LOGS-MASTER-FORD-LTP-BORING-LOGS-071621.GPJ ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/15/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/15/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 64° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	X		45		0.0	[Hatched Pattern]	(9.1-25.0') CLAY, high plasticity, no dilatancy; trace sand, medium, subrounded to subangular; trace pebbles, small, subrounded to subangular; moist to dry; soft to medium stiff; gray (10YR 5/1).	(0.0-25.0') Bentonite Backfill.	
22					0.0				
23					0.0				
24					0.0				
25					0.0				
26						End of boring at 25.0' bgs. Refusal due to dense clay.			
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks: VAP Samples Collected on 6/15/21: 5.0-9.9' bgs at 10:45, 8.0-12.0' bgs at 09:55.

SOIL BORING LOG - 2013 V:\ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOMMON\FORD\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ - ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/15/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/15/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 70° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
0					0.0		(0.0-0.3') TOPSOIL/GRASS.		
1					0.0		(0.3-7.0') SAND, fine to medium, subrounded to subangular; trace small pebbles, subrounded to subangular; well sorted; dry; brown (10YR 5/3).		
2					0.0				
3			72		0.0				
4					0.0				
5					0.0				
6					0.0				
7					0.0		(7.0-7.6') SAND, fine to very coarse, subrounded to subangular; trace pebbles, small, subrounded to subangular; poorly sorted; dry; brown (10YR 6/3).		
8			42		0.0				
9					0.0		(7.6-14.0') SAND, very fine to fine; some silt; well sorted; dry to wet; pale brown (10YR 6/3). Note: Boring appears wet at 8.5' bgs.		
10					0.0		Note: Small ~1.0" thick seam of high plasticity clay at 9.5' bgs.	(0.0-30.0') Bentonite Backfill.	
11				VAP-56_8.5-12.5 _061521@ 14:40	0.0				
12					0.0				
13			49		0.0				
14					0.0		Note: Small ~1.0" thick seam of high plasticity clay at 13.9' bgs.		
15					0.0				
16				VAP-56_14-18 _061521 @ 14:20	0.0		(14.0-16.2') SAND, medium to coarse, subrounded to subangular; little sand, very coarse, subrounded to subangular; trace pebbles, small, subrounded to subangular; well sorted; wet; brown (10YR 5/3).		
17					0.0		(16.2-19.8') SAND, fine to medium, subrounded to subangular; trace sand, coarse, subrounded to subangular; trace pebbles, small, subrounded to subangular; well sorted; wet; light brownish gray (10YR 6/2).		
18			46		0.0				
19					0.0				
20					0.0				

Drilling Co.: Fibertec Sampling Method: 5' Macrocore
 Driller: Rhex Moore Sampling Interval: Continuous
 Drilling Method: Hand Auger / Direct Push Water Level Start (ft. bgs.): 8.5
 Drilling Fluid: None Water Level Finish (ft. btoc.): 22.5
 Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface. Converted to Well: Yes No
Hand Auger to 5.0' bgs. Surface Elev.: _____
 North Coor.: _____
 East Coor.: _____

SOIL BORING LOG - 2013 \ARCADIS\US\COMMON\PROJECTS\LIVONIA\NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ_ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/15/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/15/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 70° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	X		51	VAP-56_19-23	0.0		(19.8-22.0') SILT, nonplastic, rapid dilatancy; some sand, very fine to fine; wet; soft; gray (10YR 6/1).	(0.0-30.0') Bentonite Backfill.	
22				_061521 @ 13:55	0.0		(22.0-22.2') CLAY, high plasticity, slow dilatancy; some silt; wet; soft; gray (10YR 6/1).		
23				and DUP-01	0.0		(22.2-22.5') SILT, nonplastic, rapid dilatancy; trace sand, very fine to fine; wet; soft; gray (10YR 6/1).		
24					0.0		(22.5-30.0') CLAY, high plasticity, slow dilatancy; little silt; moist to dry; soft; gray (10YR 6/1).		
25					0.0				
26	X		41		0.0	/ / / / /			
27					0.0				
28					0.0				
29					0.0				
30					0.0				
31					0.0				
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks: VAP Samples Collected on 6/15/21: 8.5-12.5' bgs at 14:40, 14.0-18.0' bgs at 14:20, 19.0-23.0' bgs at 13:55.

SOIL BORING LOG - 2013 V:\ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOM\MON\FORD\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER.FORD.LTP.BORING.LOGS.071621.GPJ - ARCADIS - 2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/16/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/16/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 65° F, Sunny

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') TOPSOIL/GRASS.		(0.0-30.0') Bentonite Backfill.	
2			60		0.0	(0.5-1.0') SAND, fine to medium, subrounded to subangular; trace pebbles, small, subrounded to subangular; well sorted; dry; brown (10YR 5/3). (1.0-3.0') CLAY, high plasticity, slow dilatancy; little sand, fine to medium, subrounded to subangular; dry; soft; gray (10YR 5/1).			
3					0.0	(3.0-4.0') SAND, medium to coarse, subrounded to subangular; trace pebbles, small, subrounded; well sorted; moist; brown (10YR 5/3).			
4					0.0	(4.0-6.0') CLAY, high plasticity, slow dilatancy; trace sand, coarse; dry; soft; gray (10YR 5/1).			
5					0.0	(6.0-30.0') CLAY, high plasticity, slow dilatancy; trace sand, coarse; trace pebbles, small, subrounded to subangular; dry; soft; gray (10YR 5/1).			
6					0.0	Note: Little silt present from 8.0-8.2' bgs.			
7			60		0.0				
8					0.0				
9					0.0				
10					0.0				
11					0.0				
12			51		0.0	Note: Little silt present and boring appears moist from 11.8-12.1' bgs.			
13					0.0				
14					0.0				
15					0.0				
16					0.0				
17					0.0				
18			60		0.0				
19					0.0				
20					0.0				

Drilling Co.: Fibertec Sampling Method: 5' Macrocore
 Driller: Rhex Moore Sampling Interval: Continuous
 Drilling Method: Hand Auger / Direct Push Water Level Start (ft. bgs.): NA
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface. Converted to Well: Yes No
Hand Auger to 5.0' bgs. Surface Elev.: _____
 North Coor: _____
 East Coor: _____

SOIL BORING LOG - 2013 \ARCADIS-US-COM\OFFICE\DATA\NOV\MI\COMMON\FORD\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ_ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/16/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/16/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 65° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	X		60		0.0	/	(6.0-30.0') CLAY, high plasticity, slow dilatancy; trace sand, coarse; trace pebbles, small, subrounded to subangular; dry; soft; gray (10YR 5/1).	(0.0-30.0') Bentonite Backfill.	
22					0.0				
23					0.0				
24					0.0				
25					0.0				
26	X		60		0.0	/	Note: No units appear wet or able to produce water.		
27					0.0				
28					0.0				
29					0.0				
30					0.0				
31							End of boring at 30.0' bgs.		
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\11\MICOMMON\FORD\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ - ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/16/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/16/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 65° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.0	(0.0-0.2') TOPSOIL/GRASS.			
2			60		0.0	(0.2-5.7') SAND, fine to medium, subrounded to subangular; trace pebbles, small, subrounded to subangular; well sorted; dry to moist; brown (10YR 5/3).			
3					0.0				
4					0.0		Note: Boring appears moist at 4.0' bgs.		
5					0.0				
6			60		0.0	(5.7-30.0') CLAY, high plasticity, slow dilatancy; trace pebbles, small, subrounded to subangular; trace silt; dry; soft; gray (10YR 5/1).			
7					0.0		Note: Little silt present from 6.0-6.1' bgs.		
8					0.0		Note: Little silt present from 8.2-8.3' bgs.		
9					0.0				
10					0.0			(0.0-30.0') Bentonite Backfill.	
11					0.0				
12			60		0.0				
13					0.0				
14					0.0		Note: Little silt present and borehole appears moist from 13.8-13.9' bgs.		
15					0.0				
16					0.0				
17			60		0.0				
18					0.0				
19					0.0				
20					0.0				

Drilling Co.: Fibertec Sampling Method: 5' Macrocore
 Driller: Rhex Moore Sampling Interval: Continuous
 Drilling Method: Hand Auger / Direct Push Water Level Start (ft. bgs.): NA
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface. Converted to Well: Yes No
Hand Auger to 5.0' bgs. Surface Elev.: _____
 North Coor: _____
 East Coor: _____

SOIL BORING LOG - 2013 VARCADIS-US-COM-OFFICE-DATA-NOV-11-MIC-COMMON-FORD-LIVONIA-03-NOTES-AND-DATA-BORING-LOGS-MASTER-FORD-LTP-BORING-LOGS-071621.GPJ - ARCADIS - 2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/16/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/16/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 65° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	X		60		0.0	(Hatched)	(5.7-30.0') CLAY, high plasticity, slow dilatancy; trace pebbles, small, subrounded to subangular; trace silt; dry; soft; gray (10YR 5/1).	(0.0-30.0') Bentonite Backfill.	
22					0.0				
23					0.0				
24					0.0				
25					0.0				
26	X		47		0.0	(Hatched)	Note: Boring does not appear wet or able to produce water.		
27					0.0				
28					0.0				
29					0.0				
30					0.0				
31							End of boring at 30.0' bgs.		
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

SOIL BORING LOG - 2013 V:\ARCADIS\US\COM\OFFICE\DATA\NOV\11\MICOMMON\FORD\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ - ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/16/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/16/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 70° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.0	(0.0-0.3') TOPSOIL/GRASS.			
2			60		0.0	(0.3-3.0') SAND, fine to medium, subrounded to subangular; trace pebbles, small to medium, subrounded to subangular; well sorted; dry; grayish brown (10YR 5/2) to dark grayish brown (10YR 4/2).			
3					0.0				
4					0.0	(3.0-4.0') CLAY, medium to high plasticity, slow dilatancy; some sand, fine to medium, subrounded to subangular; trace silt; dry; soft; grayish brown (10YR 5/2).			
5					0.0	(4.0-30.0') CLAY, high plasticity, slow to no dilatancy; trace sand, medium; trace silt; trace pebbles, small, subrounded to subangular; soft; dry; grayish brown (10YR 5/2).			
6					0.0		Note: Little silt present from 5.5-5.9' bgs and clay changes to stiff at 6.0' bgs.		
7			60		0.0				
8					0.0		Note: Color change to dark gray (10YR 4/1) at 8.2' bgs.		
9					0.0				
10					0.0			(0.0-30.0') Bentonite Backfill.	
11					0.0				
12					0.0				
13			60		0.0				
14					0.0				
15					0.0				
16					0.0				
17					0.0				
18			60		0.0				
19					0.0				
20					0.0				

Drilling Co.: Fibertec Sampling Method: 5' Macrocore
 Driller: Rhex Moore Sampling Interval: Continuous
 Drilling Method: Hand Auger / Direct Push Water Level Start (ft. bgs.): NA
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface. Converted to Well: Yes No
Hand Auger to 5.0' bgs. Surface Elev.: _____
 North Coor: _____
 East Coor: _____

SOIL BORING LOG - 2013 \ARCADIS\US\COMMON\PROJECTS\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ - ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/16/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/16/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 70° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	X		50		0.0	/	(4.0-30.0') CLAY, high plasticity, slow to no dilatancy; trace sand, medium; trace silt; trace pebbles, small, subrounded to subangular; soft; dry; grayish brown (10YR 5/2). Note: Trace pebbles, large, subrounded to subangular from 20.0-30.0' bgs.	(0.0-30.0') Bentonite Backfill.	
22					0.0				
23					0.0				
24					0.0				
25					0.0				
26	X		56		0.0	/	Note: Boring does not appear wet or able to produce water.		
27					0.0				
28					0.0				
29					0.0				
30					0.0				
31							End of boring at 30.0' bgs.		
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\11\MICOMMON\FORD\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ - ARCADIS_2013.GDT 7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/17/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/17/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 70° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
0.0					0.0	(0.0-0.5') TOPSOIL/GRASS.		(0.0-30.0') Bentonite Backfill.	
1					0.0	(0.5-3.0') SAND, fine to medium, subrounded to subangular; trace pebbles, small, subrounded to subangular; well sorted; dry; brown (10YR 5/3). Note: Little large pebbles to small cobbles present from 0.5-1.0' bgs.			
2					0.0				
3			72		0.0				
4					0.0	(3.0-30.0') CLAY, high plasticity, slow dilatancy; trace sand, medium; trace pebbles, small, subrounded to subangular; trace silt; dry; soft; grayish brown (10YR 5/2) to gray (10YR 5/1).			
5					0.0				
6					0.0	Note: Little silt present and borehole appears moist from 5.3-5.8' bgs. Note: Clay changes to stiff from 6.0-14.0' bgs.			
7					0.0				
8			48		0.0				
9					0.0	Note: Little silt present from 9.0-9.1' bgs.			
10					0.0	Note: Little silt present from 9.8-9.1' bgs.			
11					0.0				
12					0.0	Note: Small ~1.0" thick seam of sand, medium to coarse, dry present at 11.5' bgs.			
13			60		0.0	Note: Small ~0.5" thick seam of sand, fine to medium, dry present at 12.3' bgs. Note: Trace pebbles, very large, subangular present at 13.0' bgs.			
14					0.0				
15					0.0				
16					0.0				
17					0.0				
18			25		0.0				
19					0.0				
20					0.0				

Drilling Co.: Fibertec Sampling Method: 5' Macrocore
 Driller: Rhex Moore Sampling Interval: Continuous
 Drilling Method: Hand Auger / Direct Push Water Level Start (ft. bgs.): NA
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA
 Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface. Converted to Well: Yes No
Hand Auger to 5.0' bgs. Surface Elev.: _____
 North Coor.: _____
 East Coor.: _____

SOIL BORING LOG - 2013 VARCADIS-US-COM-OFFICE-DATA-NOV-11-MIC-COMMON-FORD-LIVONIA-03-NOTES-AND-DATA-BORING-LOGS-MASTER-FORD-LTP-BORING-LOGS-071621.GPJ-ARCADIS_2013.GDT-7/16/21

Soil Boring Log

Project Name: Ford Livonia Automatic Transmissions Plant Date Started: 06/17/2021 Logger: C. Weaver
 Project Number: 30050315 Date Completed: 06/17/2021 Editor: C. Weaver
 Project Location: Livonia, MI Weather Conditions: 70° F, Sunny

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	X		40		0.0	(Hatched)	(3.0-30.0') CLAY, high plasticity, slow dilatancy; trace sand, medium; trace pebbles, small, subrounded to subangular; trace silt; dry; soft; grayish brown (10YR 5/2) to gray (10YR 5/1).	(0.0-30.0') Bentonite Backfill.	
22					0.0				
23					0.0				
24					0.0				
25					0.0				
26	X		42		0.0	(Hatched)	Note: Boring does not appear wet or able to produce water.		
27					0.0				
28					0.0				
29					0.0				
30					0.0				
31							End of boring at 30.0' bgs.		
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\H\MICOM\MON\FORD\LIVONIA\03 NOTES AND DATA\BORING LOGS\MASTER_FORD_LTP BORING LOGS_071621.GPJ - ARCADIS_2013.GDT 7/16/21

Attachment 2

Laboratory Analytical Reports

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG # 240-151287-1

CADENA Verification Report: 2021-06-28

Analyses Performed By:
TestAmerica
Edison, New Jersey

Report #42015R
Review Level: Tier III
Project: 30080642.201.01



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-151287-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						VOC (Full Scan)	VOC (SIM)	MISC
240-151287-1	VAP-53_15.5-19.5_061421	240-151287-1	Water	6/14/2021		X	X	
	VAP-53_9.5-13.5_061421	240-151287-2	Water	6/14/2021		X	X	
	VAP-53_4.5-8.5_061421	240-151287-3	Water	6/14/2021		X	X	
	VAP-54_19.5-23.5_061421	240-151287-4	Water	6/14/2021		X	X	
	VAP-54_14-18_061421	240-151287-5	Water	6/14/2021		X	X	
	VAP-54_9-13_061421	240-151287-6	Water	6/14/2021		X	X	
	TRIP BLANK	240-151287-7	Water	6/14/2021		X		
	VAP_55_8-12_061521	240-151287-8	Water	6/15/2021		X	X	
	VAP_55_5-9_061521	240-151287-9	Water	6/15/2021		X	X	
	VAP_56_19-23_061521	240-151287-10	Water	6/15/2021		X	X	
	VAP_56_14-18_061521	240-151287-11	Water	6/15/2021		X	X	
	DUP 01	240-151287-12	Water	6/15/2021	VAP-56_19-23_061521	X	X	
	VAP-56_8.5-12.5_061521	240-151287-13	Water	6/15/2021		X	X	

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

The sample IDs listed on the COC were revised by the laboratory at the request of the project team.

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
 - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
 - J+ The result is an estimated quantity, but the result may be biased high.
 - J- The result is an estimated quantity, but the result may be biased low.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis (7 days if unpreserved)	Cool to < 6 °C; pH < 2 with HCl

The laboratory case narrative indicates the aliquots for the SIM analysis for samples VAP_54_19.5-23.5_061421 (240-151287-4), VAP_54_14-18_061421 (240-151287-5) and VAP_54_9-13_061421 (240-151287-6) were all received with a pH above 2. However, the samples were analyzed in less than 7 days; therefore, no qualification was applied to the SIM analysis.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

DATA REVIEW

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
VAP-56_19-23_061521/DUP 01	All compounds	U	U	NC

Notes:

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE:



DATE: July 15, 2021

PEER REVIEW: Joseph C. Houser

DATE: July 15, 2021



**CHAIN OF CUSTODY
CORRECTED SAMPLE ANALYSIS DATA
SHEETS**



Chain of Custody Record
 6/14/21

Environment Testing
 TestAmerica

TAL-8210

Regulatory Program: DW NPDES RCRA Other: _____

Project Manager: KRIS HUSKEY
 Tel/Email: 269-579-5402
 Date: 6/14/2021
 Carrier: _____

Client Contact
 Company Name: ARCADIS
 Address: 28550 CAROL DRIVE
 City/State/Zip: NOVI MI 48377
 Phone: 248-994-2240
 Fax: _____
 Project Name: FORD LTP
 Site: LIVONIA
 P O #: 30080642.201

Site Contact: CHRISTINA WEAVER
 Lab Contact: MIKE DEBASCIO
 Date: 6/14/2021
 Carrier: _____

Analysis Turnaround Time
 CALENDAR DAYS WORKING DAYS
 TAT if different from Below _____
 2 weeks STANDARD
 1 week
 2 days
 1 day

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	1,1-DCE (METHOD 8260B)	CIS-1,2-DCE (METHOD 8260B)	TRANS-1,2-DCE (METHOD 8260B)	PCB (METHOD 8260B)	TCE (METHOD 8260B)	VENVL CHLORIDE (METHOD 8260B)	1,4-DIOXANE (METHOD 8260B-SIM)	Specific Notes:
VAP-52-15.5-19.5-061421	6/14/21	1035	G	GW	6	N	N	X	X	X	X	X	X	X	3 VOAS METHOD 8260 B 3 VOAS METHOD 8260B-SIM
VAP-52-9.5-13.5-061421	6/14/21	1055	G	GW	6	N	N	X	X	X	X	X	X	X	" "
VAP-52-4.5-8.5-061421	6/14/21	1110	G	GW	6	N	N	X	X	X	X	X	X	X	" "
VAP-53-19.5-23.5-061421	6/14/21	1425	G	GW	6	N	N	X	X	X	X	X	X	X	" "
VAP-53-14-18-061421	6/14/21	1445	G	GW	6	N	N	X	X	X	X	X	X	X	" "
VAP-53-9-13-061421	6/14/21	1510	G	GW	6	N	N	X	X	X	X	X	X	X	" "
TRIP BLANK 01	6/14/21	-	G	GW	1	N	N	X	X	X	X	X	X	X	1 TRIP BLANK
VAP-54-8-12-061521	6/15/21	0955	G	GW	6	N	N	X	X	X	X	X	X	X	3 VOAS METHOD 8260 B 3 VOAS METHOD 8260B-SIM
VAP-54-5-9-061521	6/15/21	1045	G	GW	6	N	N	X	X	X	X	X	X	X	" "
VAP-55-19-23-061521	6/15/21	1355	G	GW	6	N	N	X	X	X	X	X	X	X	" "
VAP-55-14-18-061521	6/15/21	1440	G	GW	6	N	N	X	X	X	X	X	X	X	" "
TRIP BLANK 02	6/15/21	-	G	GW	6	N	N	X	X	X	X	X	X	X	" "

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

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

Non-Hazard Flammable Skin Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments: SUBMIT ALL RESULTS THROUGH CADENA AT JIM.TOMALIA@CADENA.COM
 LEVEL IV REPORTING

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return to Client Disposal by Lab Archive for _____ Months

Custody Seal No.:	Company:	Date/Time:	Cooler Temp. (°C):	Obs'd:	Corrid:	Therm ID No.:
ARCADIS	ARCADIS	6/14/21/1700	NOUE	COOL STORAGE	ARCADIS	6/14/21/1700
ARCADIS	ARCADIS	6/15/21/1620	ARCADIS	ARCADIS	ARCADIS	6/15/21/1617
ARCADIS	ARCADIS	6/16/21/08:00	ARCADIS	ARCADIS	ARCADIS	6/16/21/08:00

TAL-8210

4.7/4.8

Address:

Regulatory Program: DW NPDES RCRA Other:

Company Name: ARCADIS Address: 28550 CABOT DRIVE #200 City/State/Zip: NOVI MI 48377 Phone: 248-994-2240 Fax: Project Name: SORO LTP Site: LEWISIA P O #: 30080642, 201, 01		Client Contact Project Manager: KES WUSKEY Tell/Email: 269-579-5402 Analysis Turnaround Time <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day STANDARD		Site Contact: MIKE DELMONICO Lab Contact: 8260 B Perform MS / MSD (Y / N) Filtered Sample (Y / N)		Date: 6/15/21 Carrier: COC No: 2 of 2 COCs Sampler: For Lab Use Only: Walk-in Client: Lab Sampling: Job / SDG No.:									
Sample Identification VAP-55-8.5-12.5-061521		Sample Date: 6/14/21		Sample Time: 1440		Sample Type (C=Comp, G=Grab): G		Matrix: Gw		# of Cont.: 6		Sample Specific Notes: 3 VOLS 8260 B 3 VOLS 8260 B SIM			
Preservation Used: 1 = Ice; 2 = HCl; 3 = H2SO4; 4 = HNO3; 5 = NaOH; 6 = Other Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.															
Special Instructions/QC Requirements & Comments: SUBMIT ALL RESULTS THROUGH CADEVA @ JIM.TOMALIA@CADEVA.COM LEVEL IV REPORTING															
Relinquished by: Charlotte Miller				Relinquished by: ARCADIS				Relinquished by: Jim Tomalia				Relinquished by: ETA			
Date/Time: 6/15/21 16:17				Date/Time: 6/15/21 16:17				Date/Time: 6-16-21 08:00				Date/Time:			



Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-52_15.5-19.5_061421

Lab Sample ID: 240-151287-1

Date Collected: 06/14/21 10:35

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 16:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	79		70 - 133		06/17/21 16:27	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 13:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 13:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	122		75 - 130		06/23/21 13:55	1
4-Bromofluorobenzene (Surr)	74		47 - 134		06/23/21 13:55	1
Toluene-d8 (Surr)	89		69 - 122		06/23/21 13:55	1
Dibromofluoromethane (Surr)	100		78 - 129		06/23/21 13:55	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-52_9.5-13.5_061421

Lab Sample ID: 240-151287-2

Date Collected: 06/14/21 10:55

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 16:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		70 - 133					06/17/21 16:52	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 14:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 14:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 14:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 14:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 14:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 14:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	120		75 - 130					06/23/21 14:17	1
4-Bromofluorobenzene (Surr)	76		47 - 134					06/23/21 14:17	1
Toluene-d8 (Surr)	88		69 - 122					06/23/21 14:17	1
Dibromofluoromethane (Surr)	98		78 - 129					06/23/21 14:17	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_52_4.5-8.5_061421

Lab Sample ID: 240-151287-3

Date Collected: 06/14/21 11:10

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 17:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		70 - 133		06/17/21 17:16	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 14:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 14:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 14:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 14:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 14:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 14:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	125		75 - 130		06/23/21 14:38	1
4-Bromofluorobenzene (Surr)	74		47 - 134		06/23/21 14:38	1
Toluene-d8 (Surr)	89		69 - 122		06/23/21 14:38	1
Dibromofluoromethane (Surr)	102		78 - 129		06/23/21 14:38	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_53_19.5-23.5_061421

Lab Sample ID: 240-151287-4

Date Collected: 06/14/21 14:25

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 17:41	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		70 - 133					06/17/21 17:41	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U J	1.0	0.49	ug/L			06/23/21 15:00	1
cis-1,2-Dichloroethene	1.0	U J	1.0	0.46	ug/L			06/23/21 15:00	1
Tetrachloroethene	1.0	U J	1.0	0.44	ug/L			06/23/21 15:00	1
trans-1,2-Dichloroethene	1.0	U J	1.0	0.51	ug/L			06/23/21 15:00	1
Trichloroethene	1.0	U J	1.0	0.44	ug/L			06/23/21 15:00	1
Vinyl chloride	1.0	U J	1.0	0.45	ug/L			06/23/21 15:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	120		75 - 130					06/23/21 15:00	1
4-Bromofluorobenzene (Surr)	79		47 - 134					06/23/21 15:00	1
Toluene-d8 (Surr)	88		69 - 122					06/23/21 15:00	1
Dibromofluoromethane (Surr)	99		78 - 129					06/23/21 15:00	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_53_14-18_061421

Lab Sample ID: 240-151287-5

Date Collected: 06/14/21 14:45

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 18:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		70 - 133					06/17/21 18:06	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 15:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 15:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 15:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 15:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 15:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 15:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	125		75 - 130					06/23/21 15:22	1
4-Bromofluorobenzene (Surr)	78		47 - 134					06/23/21 15:22	1
Toluene-d8 (Surr)	87		69 - 122					06/23/21 15:22	1
Dibromofluoromethane (Surr)	103		78 - 129					06/23/21 15:22	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_53_9-13_061421

Lab Sample ID: 240-151287-6

Date Collected: 06/14/21 15:10

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 18:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		70 - 133		06/17/21 18:30	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 15:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 15:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 15:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 15:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 15:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 15:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	124		75 - 130		06/23/21 15:44	1
4-Bromofluorobenzene (Surr)	73		47 - 134		06/23/21 15:44	1
Toluene-d8 (Surr)	88		69 - 122		06/23/21 15:44	1
Dibromofluoromethane (Surr)	101		78 - 129		06/23/21 15:44	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-151287-7

Date Collected: 06/14/21 00:00

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 16:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 16:10	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 16:10	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:10	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 16:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	123		75 - 130		06/23/21 16:10	1
4-Bromofluorobenzene (Surr)	74		47 - 134		06/23/21 16:10	1
Toluene-d8 (Surr)	86		69 - 122		06/23/21 16:10	1
Dibromofluoromethane (Surr)	100		78 - 129		06/23/21 16:10	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_54_8-12_061521

Lab Sample ID: 240-151287-8

Date Collected: 06/15/21 09:55

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 18:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		70 - 133					06/17/21 18:55	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 16:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 16:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 16:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 16:31	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	122		75 - 130					06/23/21 16:31	1
4-Bromofluorobenzene (Surr)	74		47 - 134					06/23/21 16:31	1
Toluene-d8 (Surr)	89		69 - 122					06/23/21 16:31	1
Dibromofluoromethane (Surr)	100		78 - 129					06/23/21 16:31	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_54_5-9_061521

Lab Sample ID: 240-151287-9

Date Collected: 06/15/21 10:45

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 19:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		70 - 133					06/17/21 19:20	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 16:53	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 16:53	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 16:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 16:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	125		75 - 130					06/23/21 16:53	1
4-Bromofluorobenzene (Surr)	75		47 - 134					06/23/21 16:53	1
Toluene-d8 (Surr)	85		69 - 122					06/23/21 16:53	1
Dibromofluoromethane (Surr)	101		78 - 129					06/23/21 16:53	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_55_19-23_061521

Lab Sample ID: 240-151287-10

Date Collected: 06/15/21 13:55

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 19:45	1
Surrogate									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		70 - 133					06/17/21 19:45	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 17:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 17:15	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 17:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 17:15	1
Surrogate									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	127		75 - 130					06/23/21 17:15	1
4-Bromofluorobenzene (Surr)	75		47 - 134					06/23/21 17:15	1
Toluene-d8 (Surr)	89		69 - 122					06/23/21 17:15	1
Dibromofluoromethane (Surr)	103		78 - 129					06/23/21 17:15	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_55_14-18061521

Lab Sample ID: 240-151287-11

Date Collected: 06/15/21 14:40

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 20:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		70 - 133					06/17/21 20:59	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 17:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 17:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 17:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 17:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	124		75 - 130					06/23/21 17:37	1
4-Bromofluorobenzene (Surr)	73		47 - 134					06/23/21 17:37	1
Toluene-d8 (Surr)	87		69 - 122					06/23/21 17:37	1
Dibromofluoromethane (Surr)	101		78 - 129					06/23/21 17:37	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: DUP 01
Date Collected: 06/15/21 00:00
Date Received: 06/16/21 08:00

Lab Sample ID: 240-151287-12
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 21:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		70 - 133					06/17/21 21:24	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 17:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 17:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 17:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 17:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	126		75 - 130					06/23/21 17:58	1
4-Bromofluorobenzene (Surr)	78		47 - 134					06/23/21 17:58	1
Toluene-d8 (Surr)	87		69 - 122					06/23/21 17:58	1
Dibromofluoromethane (Surr)	102		78 - 129					06/23/21 17:58	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-55_8.5-12.5_061521

Lab Sample ID: 240-151287-13

Date Collected: 06/14/21 14:40

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 21:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		70 - 133		06/17/21 21:48	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 18:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 18:20	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 18:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 18:20	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 18:20	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 18:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	127		75 - 130		06/23/21 18:20	1
4-Bromofluorobenzene (Surr)	76		47 - 134		06/23/21 18:20	1
Toluene-d8 (Surr)	85		69 - 122		06/23/21 18:20	1
Dibromofluoromethane (Surr)	102		78 - 129		06/23/21 18:20	1

DATA VERIFICATION REPORT



REVISED REPORT: July 15, 2021

REVISION SUMMARY: Sample ID's updated at client request.

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631

Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater

Project number: 30080642.201

Event Specific Scope of Work References: Sample COC

Laboratory: TestAmerica - North Canton

Laboratory submittal: 151287-1

Sample date: 2021-06-15 2021-06-14

Report received by CADENA: 2021-06-28

Initial Data Verification completed by CADENA: 2021-06-28

Number of Samples: 12 Water and 1 trip blank

Sample Matrices: Water

Test Categories: GCMS VOC and GCMS-SIM

Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

HTQ - Sample result should be considered estimated and qualified with a J flag if detected and UJ flag if non-detect. Client sample was received/prepped/analyzed outside of the referenced holding time for the noted test (pH greater than 2 so analytical holding time of 7 days was referenced):

GCMS VOC sample -004.

Note: GCMS VOC-SIM samples -004, -005, -006 also had a pH of greater than 2 but were analyzed in less than 7 days so were not qualified.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Qualifiers added during verification have been added to the electronic data which is available for download from the CADENA CLMS. Refer to the attached table of analytical results that have been qualified during verification.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at <http://clms.cadenaco.com/index.cfm>.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia, Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 151287-1

Sample Name: VAP-54_19.5-23.5_061421

Lab Sample ID: 2401512874

Sample Date: 6/14/2021

Analyte	Cas No.	Result	Report		Valid	
			Limit	Units	Qualifier	
GC/MS VOC						
<u>OSW-8260B</u>						
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	

Analytical Results Summary

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 151287-1

Sample Name:	TRIP BLANK	VAP-55_8-12_061521	VAP-55_5-9_061521
Lab Sample ID:	2401512877	2401512878	2401512879
Sample Date:	6/14/2021	6/15/2021	6/15/2021

Analyte	Cas No.	Report		Valid	Report		Valid	Report		Valid			
		Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier
GC/MS VOC													
<u>OSW-8260B</u>													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
<u>OSW-8260BBSim</u>													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ANALYTICAL REPORT

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

Laboratory Job ID: 240-151287-1
Client Project/Site: Ford LTP
Revision: 1

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

Attn: Kristoffer Hinskey



Authorized for release by:
7/15/2021 8:14:33 AM

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

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

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



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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Qualifiers

GC/MS VOA

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

Glossary

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

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Job ID: 240-151287-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-151287-1

Comments

No additional comments.

Receipt

The samples were received on 6/16/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.8° C.

GC/MS VOA

Method 8260B: The pH of the sample was greater than 2. The sample was analyzed within the normal 14 day holding time; however, experimental evidence suggests that some aromatic compounds in wastewater samples, notably, Benzene, Toluene, and Ethylbenzene are susceptible to biological degradation if sample is not preserved to a pH of 2: VAP_54_19.5-23.5_061421 (240-151287-4).

Method 8260B SIM: The following samples had a pH above 2: VAP_54_19.5-23.5_061421 (240-151287-4), VAP_54_14-18_061421 (240-151287-5) and VAP_54_9-13_061421 (240-151287-6).

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

VOA Prep

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

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396



Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-151287-1	VAP-53_15.5-19.5_061421	Water	06/14/21 10:35	06/16/21 08:00	
240-151287-2	VAP-53_9.5-13.5_061421	Water	06/14/21 10:55	06/16/21 08:00	
240-151287-3	VAP-53_4.5-8.5_061421	Water	06/14/21 11:10	06/16/21 08:00	
240-151287-4	VAP-54_19.5-23.5_061421	Water	06/14/21 14:25	06/16/21 08:00	
240-151287-5	VAP-54_14-18_061421	Water	06/14/21 14:45	06/16/21 08:00	
240-151287-6	VAP-54_9-13_061421	Water	06/14/21 15:10	06/16/21 08:00	
240-151287-7	TRIP BLANK	Water	06/14/21 00:00	06/16/21 08:00	
240-151287-8	VAP_55_8-12_061521	Water	06/15/21 09:55	06/16/21 08:00	
240-151287-9	VAP_55_5-9_061521	Water	06/15/21 10:45	06/16/21 08:00	
240-151287-10	VAP_56_19-23_061521	Water	06/15/21 13:55	06/16/21 08:00	
240-151287-11	VAP_56_14-18_061521	Water	06/15/21 14:40	06/16/21 08:00	
240-151287-12	DUP 01	Water	06/15/21 00:00	06/16/21 08:00	
240-151287-13	VAP-56_8.5-12.5_061521	Water	06/14/21 14:40	06/16/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-53_15.5-19.5_061421 **Lab Sample ID: 240-151287-1**

No Detections.

Client Sample ID: VAP-53_9.5-13.5_061421 **Lab Sample ID: 240-151287-2**

No Detections.

Client Sample ID: VAP-53_4.5-8.5_061421 **Lab Sample ID: 240-151287-3**

No Detections.

Client Sample ID: VAP-54_19.5-23.5_061421 **Lab Sample ID: 240-151287-4**

No Detections.

Client Sample ID: VAP-54_14-18_061421 **Lab Sample ID: 240-151287-5**

No Detections.

Client Sample ID: VAP-54_9-13_061421 **Lab Sample ID: 240-151287-6**

No Detections.

Client Sample ID: TRIP BLANK **Lab Sample ID: 240-151287-7**

No Detections.

Client Sample ID: VAP_55_8-12_061521 **Lab Sample ID: 240-151287-8**

No Detections.

Client Sample ID: VAP_55_5-9_061521 **Lab Sample ID: 240-151287-9**

No Detections.

Client Sample ID: VAP_56_19-23_061521 **Lab Sample ID: 240-151287-10**

No Detections.

Client Sample ID: VAP_56_14-18_061521 **Lab Sample ID: 240-151287-11**

No Detections.

Client Sample ID: DUP 01 **Lab Sample ID: 240-151287-12**

No Detections.

Client Sample ID: VAP-56_8.5-12.5_061521 **Lab Sample ID: 240-151287-13**

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-53_15.5-19.5_061421

Lab Sample ID: 240-151287-1

Date Collected: 06/14/21 10:35

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 16:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	79		70 - 133		06/17/21 16:27	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 13:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 13:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	122		75 - 130		06/23/21 13:55	1
4-Bromofluorobenzene (Surr)	74		47 - 134		06/23/21 13:55	1
Toluene-d8 (Surr)	89		69 - 122		06/23/21 13:55	1
Dibromofluoromethane (Surr)	100		78 - 129		06/23/21 13:55	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-53_9.5-13.5_061421

Lab Sample ID: 240-151287-2

Date Collected: 06/14/21 10:55

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 16:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		70 - 133					06/17/21 16:52	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 14:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 14:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 14:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 14:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 14:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 14:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	120		75 - 130					06/23/21 14:17	1
4-Bromofluorobenzene (Surr)	76		47 - 134					06/23/21 14:17	1
Toluene-d8 (Surr)	88		69 - 122					06/23/21 14:17	1
Dibromofluoromethane (Surr)	98		78 - 129					06/23/21 14:17	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-53_4.5-8.5_061421

Lab Sample ID: 240-151287-3

Date Collected: 06/14/21 11:10

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 17:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		70 - 133		06/17/21 17:16	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 14:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 14:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 14:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 14:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 14:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 14:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	125		75 - 130		06/23/21 14:38	1
4-Bromofluorobenzene (Surr)	74		47 - 134		06/23/21 14:38	1
Toluene-d8 (Surr)	89		69 - 122		06/23/21 14:38	1
Dibromofluoromethane (Surr)	102		78 - 129		06/23/21 14:38	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-54_19.5-23.5_061421

Lab Sample ID: 240-151287-4

Date Collected: 06/14/21 14:25

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 17:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		70 - 133		06/17/21 17:41	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 15:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 15:00	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 15:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 15:00	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 15:00	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 15:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	120		75 - 130		06/23/21 15:00	1
4-Bromofluorobenzene (Surr)	79		47 - 134		06/23/21 15:00	1
Toluene-d8 (Surr)	88		69 - 122		06/23/21 15:00	1
Dibromofluoromethane (Surr)	99		78 - 129		06/23/21 15:00	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-54_14-18_061421

Lab Sample ID: 240-151287-5

Date Collected: 06/14/21 14:45

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 18:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		70 - 133					06/17/21 18:06	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 15:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 15:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 15:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 15:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 15:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 15:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	125		75 - 130					06/23/21 15:22	1
4-Bromofluorobenzene (Surr)	78		47 - 134					06/23/21 15:22	1
Toluene-d8 (Surr)	87		69 - 122					06/23/21 15:22	1
Dibromofluoromethane (Surr)	103		78 - 129					06/23/21 15:22	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-54_9-13_061421

Lab Sample ID: 240-151287-6

Date Collected: 06/14/21 15:10

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 18:30	1
Surrogate									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		70 - 133					06/17/21 18:30	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 15:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 15:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 15:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 15:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 15:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 15:44	1
Surrogate									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	124		75 - 130					06/23/21 15:44	1
4-Bromofluorobenzene (Surr)	73		47 - 134					06/23/21 15:44	1
Toluene-d8 (Surr)	88		69 - 122					06/23/21 15:44	1
Dibromofluoromethane (Surr)	101		78 - 129					06/23/21 15:44	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-151287-7

Date Collected: 06/14/21 00:00

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 16:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 16:10	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 16:10	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:10	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 16:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	123		75 - 130		06/23/21 16:10	1
4-Bromofluorobenzene (Surr)	74		47 - 134		06/23/21 16:10	1
Toluene-d8 (Surr)	86		69 - 122		06/23/21 16:10	1
Dibromofluoromethane (Surr)	100		78 - 129		06/23/21 16:10	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_55_8-12_061521

Lab Sample ID: 240-151287-8

Date Collected: 06/15/21 09:55

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 18:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		70 - 133					06/17/21 18:55	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 16:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 16:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 16:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 16:31	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	122		75 - 130					06/23/21 16:31	1
4-Bromofluorobenzene (Surr)	74		47 - 134					06/23/21 16:31	1
Toluene-d8 (Surr)	89		69 - 122					06/23/21 16:31	1
Dibromofluoromethane (Surr)	100		78 - 129					06/23/21 16:31	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_55_5-9_061521

Lab Sample ID: 240-151287-9

Date Collected: 06/15/21 10:45

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 19:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		70 - 133					06/17/21 19:20	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 16:53	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 16:53	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 16:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 16:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 16:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	125		75 - 130					06/23/21 16:53	1
4-Bromofluorobenzene (Surr)	75		47 - 134					06/23/21 16:53	1
Toluene-d8 (Surr)	85		69 - 122					06/23/21 16:53	1
Dibromofluoromethane (Surr)	101		78 - 129					06/23/21 16:53	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_56_19-23_061521

Lab Sample ID: 240-151287-10

Date Collected: 06/15/21 13:55

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 19:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		70 - 133		06/17/21 19:45	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 17:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 17:15	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 17:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 17:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	127		75 - 130		06/23/21 17:15	1
4-Bromofluorobenzene (Surr)	75		47 - 134		06/23/21 17:15	1
Toluene-d8 (Surr)	89		69 - 122		06/23/21 17:15	1
Dibromofluoromethane (Surr)	103		78 - 129		06/23/21 17:15	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP_56_14-18061521

Lab Sample ID: 240-151287-11

Date Collected: 06/15/21 14:40

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 20:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		70 - 133		06/17/21 20:59	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 17:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 17:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 17:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 17:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	124		75 - 130		06/23/21 17:37	1
4-Bromofluorobenzene (Surr)	73		47 - 134		06/23/21 17:37	1
Toluene-d8 (Surr)	87		69 - 122		06/23/21 17:37	1
Dibromofluoromethane (Surr)	101		78 - 129		06/23/21 17:37	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: DUP 01

Lab Sample ID: 240-151287-12

Date Collected: 06/15/21 00:00

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 21:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		70 - 133		06/17/21 21:24	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 17:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 17:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 17:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 17:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 17:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	126		75 - 130		06/23/21 17:58	1
4-Bromofluorobenzene (Surr)	78		47 - 134		06/23/21 17:58	1
Toluene-d8 (Surr)	87		69 - 122		06/23/21 17:58	1
Dibromofluoromethane (Surr)	102		78 - 129		06/23/21 17:58	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-56_8.5-12.5_061521

Lab Sample ID: 240-151287-13

Date Collected: 06/14/21 14:40

Matrix: Water

Date Received: 06/16/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			06/17/21 21:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		70 - 133		06/17/21 21:48	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 18:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 18:20	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 18:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 18:20	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 18:20	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 18:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	127		75 - 130		06/23/21 18:20	1
4-Bromofluorobenzene (Surr)	76		47 - 134		06/23/21 18:20	1
Toluene-d8 (Surr)	85		69 - 122		06/23/21 18:20	1
Dibromofluoromethane (Surr)	102		78 - 129		06/23/21 18:20	1

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (75-130)	BFB (47-134)	TOL (69-122)	DBFM (78-129)
240-151189-B-20 MS	Matrix Spike	111	99	99	92
240-151189-B-20 MSD	Matrix Spike Duplicate	107	100	97	94
240-151287-1	VAP-53_15.5-19.5_061421	122	74	89	100
240-151287-2	VAP-53_9.5-13.5_061421	120	76	88	98
240-151287-3	VAP-53_4.5-8.5_061421	125	74	89	102
240-151287-4	VAP-54_19.5-23.5_061421	120	79	88	99
240-151287-5	VAP-54_14-18_061421	125	78	87	103
240-151287-6	VAP-54_9-13_061421	124	73	88	101
240-151287-7	TRIP BLANK	123	74	86	100
240-151287-8	VAP_55_8-12_061521	122	74	89	100
240-151287-9	VAP_55_5-9_061521	125	75	85	101
240-151287-10	VAP_56_19-23_061521	127	75	89	103
240-151287-11	VAP_56_14-18061521	124	73	87	101
240-151287-12	DUP 01	126	78	87	102
240-151287-13	VAP-56_8.5-12.5_061521	127	76	85	102
LCS 240-491948/4	Lab Control Sample	103	100	95	91
MB 240-491948/7	Method Blank	114	81	89	94

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)
		DCA (70-133)
240-151287-1	VAP-53_15.5-19.5_061421	79
240-151287-2	VAP-53_9.5-13.5_061421	81
240-151287-3	VAP-53_4.5-8.5_061421	84
240-151287-4	VAP-54_19.5-23.5_061421	81
240-151287-5	VAP-54_14-18_061421	83
240-151287-6	VAP-54_9-13_061421	81
240-151287-8	VAP_55_8-12_061521	82
240-151287-9	VAP_55_5-9_061521	83
240-151287-10	VAP_56_19-23_061521	82
240-151287-10 MS	VAP_56_19-23_061521	85
240-151287-10 MSD	VAP_56_19-23_061521	83
240-151287-11	VAP_56_14-18061521	83
240-151287-12	DUP 01	84
240-151287-13	VAP-56_8.5-12.5_061521	86
LCS 240-491180/4	Lab Control Sample	78
MB 240-491180/5	Method Blank	76

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-491948/7
Matrix: Water
Analysis Batch: 491948

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			06/23/21 11:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			06/23/21 11:00	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 11:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			06/23/21 11:00	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			06/23/21 11:00	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			06/23/21 11:00	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	114		75 - 130		06/23/21 11:00	1
4-Bromofluorobenzene (Surr)	81		47 - 134		06/23/21 11:00	1
Toluene-d8 (Surr)	89		69 - 122		06/23/21 11:00	1
Dibromofluoromethane (Surr)	94		78 - 129		06/23/21 11:00	1

Lab Sample ID: LCS 240-491948/4
Matrix: Water
Analysis Batch: 491948

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.38		ug/L		84	73 - 129
cis-1,2-Dichloroethene	10.0	9.35		ug/L		93	75 - 124
Tetrachloroethene	10.0	9.52		ug/L		95	70 - 125
trans-1,2-Dichloroethene	10.0	9.09		ug/L		91	74 - 130
Trichloroethene	10.0	9.07		ug/L		91	71 - 121
Vinyl chloride	10.0	11.0		ug/L		110	61 - 134

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	103		75 - 130
4-Bromofluorobenzene (Surr)	100		47 - 134
Toluene-d8 (Surr)	95		69 - 122
Dibromofluoromethane (Surr)	91		78 - 129

Lab Sample ID: 240-151189-B-20 MS
Matrix: Water
Analysis Batch: 491948

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10	U	100	81.6		ug/L		82	64 - 132
cis-1,2-Dichloroethene	10	U	100	88.7		ug/L		89	68 - 121
Tetrachloroethene	10	U	100	87.8		ug/L		88	52 - 129
trans-1,2-Dichloroethene	10	U	100	93.4		ug/L		93	69 - 126
Trichloroethene	12		100	97.1		ug/L		85	56 - 124
Vinyl chloride	10	U	100	103		ug/L		103	49 - 136

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	111		75 - 130
4-Bromofluorobenzene (Surr)	99		47 - 134
Toluene-d8 (Surr)	99		69 - 122

Eurofins TestAmerica, Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-151189-B-20 MS
Matrix: Water
Analysis Batch: 491948

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	92		78 - 129

Lab Sample ID: 240-151189-B-20 MSD
Matrix: Water
Analysis Batch: 491948

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD		Unit	D	%Rec	%Rec.		RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits	RPD		
1,1-Dichloroethene	10	U	100	92.8		ug/L		93	64 - 132	13	35	
cis-1,2-Dichloroethene	10	U	100	95.8		ug/L		96	68 - 121	8	35	
Tetrachloroethene	10	U	100	100		ug/L		100	52 - 129	13	35	
trans-1,2-Dichloroethene	10	U	100	102		ug/L		102	69 - 126	9	35	
Trichloroethene	12		100	104		ug/L		92	56 - 124	7	35	
Vinyl chloride	10	U	100	104		ug/L		104	49 - 136	1	35	

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	107		75 - 130
4-Bromofluorobenzene (Surr)	100		47 - 134
Toluene-d8 (Surr)	97		69 - 122
Dibromofluoromethane (Surr)	94		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-491180/5
Matrix: Water
Analysis Batch: 491180

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,4-Dioxane	2.0	U	2.0	0.86	ug/L		06/17/21 14:48	1	

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	76		70 - 133		06/17/21 14:48	1

Lab Sample ID: LCS 240-491180/4
Matrix: Water
Analysis Batch: 491180

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

Analyte	Spike	LCS		Unit	D	%Rec	%Rec.	
		Result	Qualifier				Limits	RPD
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135	

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	78		70 - 133

Lab Sample ID: 240-151287-10 MS
Matrix: Water
Analysis Batch: 491180

Client Sample ID: VAP_56_19-23_061521
Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MS		Unit	D	%Rec	%Rec.	
	Result	Qualifier		Result	Qualifier				Limits	RPD
1,4-Dioxane	2.0	U	10.0	10.3		ug/L		103	46 - 170	

Eurofins TestAmerica, Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

<i>Surrogate</i>	<i>%Recovery</i>	<i>MS MS Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	85		70 - 133

Lab Sample ID: 240-151287-10 MSD
Matrix: Water
Analysis Batch: 491180

Client Sample ID: VAP_56_19-23_061521
Prep Type: Total/NA

<i>Analyte</i>	<i>Sample Result</i>	<i>Sample Qualifier</i>	<i>Spike Added</i>	<i>MSD Result</i>	<i>MSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec. Limits</i>	<i>RPD</i>	<i>RPD Limit</i>
1,4-Dioxane	2.0	U	10.0	10.6		ug/L		106	46 - 170	3	26

<i>Surrogate</i>	<i>%Recovery</i>	<i>MSD MSD Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	83		70 - 133

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

GC/MS VOA

Analysis Batch: 491180

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-151287-1	VAP-53_15.5-19.5_061421	Total/NA	Water	8260B SIM	
240-151287-2	VAP-53_9.5-13.5_061421	Total/NA	Water	8260B SIM	
240-151287-3	VAP-53_4.5-8.5_061421	Total/NA	Water	8260B SIM	
240-151287-4	VAP-54_19.5-23.5_061421	Total/NA	Water	8260B SIM	
240-151287-5	VAP-54_14-18_061421	Total/NA	Water	8260B SIM	
240-151287-6	VAP-54_9-13_061421	Total/NA	Water	8260B SIM	
240-151287-8	VAP_55_8-12_061521	Total/NA	Water	8260B SIM	
240-151287-9	VAP_55_5-9_061521	Total/NA	Water	8260B SIM	
240-151287-10	VAP_56_19-23_061521	Total/NA	Water	8260B SIM	
240-151287-11	VAP_56_14-18061521	Total/NA	Water	8260B SIM	
240-151287-12	DUP 01	Total/NA	Water	8260B SIM	
240-151287-13	VAP-56_8.5-12.5_061521	Total/NA	Water	8260B SIM	
MB 240-491180/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-491180/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-151287-10 MS	VAP_56_19-23_061521	Total/NA	Water	8260B SIM	
240-151287-10 MSD	VAP_56_19-23_061521	Total/NA	Water	8260B SIM	

Analysis Batch: 491948

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-151287-1	VAP-53_15.5-19.5_061421	Total/NA	Water	8260B	
240-151287-2	VAP-53_9.5-13.5_061421	Total/NA	Water	8260B	
240-151287-3	VAP-53_4.5-8.5_061421	Total/NA	Water	8260B	
240-151287-4	VAP-54_19.5-23.5_061421	Total/NA	Water	8260B	
240-151287-5	VAP-54_14-18_061421	Total/NA	Water	8260B	
240-151287-6	VAP-54_9-13_061421	Total/NA	Water	8260B	
240-151287-7	TRIP BLANK	Total/NA	Water	8260B	
240-151287-8	VAP_55_8-12_061521	Total/NA	Water	8260B	
240-151287-9	VAP_55_5-9_061521	Total/NA	Water	8260B	
240-151287-10	VAP_56_19-23_061521	Total/NA	Water	8260B	
240-151287-11	VAP_56_14-18061521	Total/NA	Water	8260B	
240-151287-12	DUP 01	Total/NA	Water	8260B	
240-151287-13	VAP-56_8.5-12.5_061521	Total/NA	Water	8260B	
MB 240-491948/7	Method Blank	Total/NA	Water	8260B	
LCS 240-491948/4	Lab Control Sample	Total/NA	Water	8260B	
240-151189-B-20 MS	Matrix Spike	Total/NA	Water	8260B	
240-151189-B-20 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-53_15.5-19.5_061421

Lab Sample ID: 240-151287-1

Date Collected: 06/14/21 10:35

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 13:55	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 16:27	CS	TAL CAN

Client Sample ID: VAP-53_9.5-13.5_061421

Lab Sample ID: 240-151287-2

Date Collected: 06/14/21 10:55

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 14:17	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 16:52	CS	TAL CAN

Client Sample ID: VAP-53_4.5-8.5_061421

Lab Sample ID: 240-151287-3

Date Collected: 06/14/21 11:10

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 14:38	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 17:16	CS	TAL CAN

Client Sample ID: VAP-54_19.5-23.5_061421

Lab Sample ID: 240-151287-4

Date Collected: 06/14/21 14:25

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 15:00	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 17:41	CS	TAL CAN

Client Sample ID: VAP-54_14-18_061421

Lab Sample ID: 240-151287-5

Date Collected: 06/14/21 14:45

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 15:22	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 18:06	CS	TAL CAN

Client Sample ID: VAP-54_9-13_061421

Lab Sample ID: 240-151287-6

Date Collected: 06/14/21 15:10

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 15:44	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 18:30	CS	TAL CAN

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-151287-7

Date Collected: 06/14/21 00:00

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 16:10	LEE	TAL CAN

Client Sample ID: VAP_55_8-12_061521

Lab Sample ID: 240-151287-8

Date Collected: 06/15/21 09:55

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 16:31	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 18:55	CS	TAL CAN

Client Sample ID: VAP_55_5-9_061521

Lab Sample ID: 240-151287-9

Date Collected: 06/15/21 10:45

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 16:53	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 19:20	CS	TAL CAN

Client Sample ID: VAP_56_19-23_061521

Lab Sample ID: 240-151287-10

Date Collected: 06/15/21 13:55

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 17:15	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 19:45	CS	TAL CAN

Client Sample ID: VAP_56_14-18061521

Lab Sample ID: 240-151287-11

Date Collected: 06/15/21 14:40

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 17:37	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 20:59	CS	TAL CAN

Client Sample ID: DUP 01

Lab Sample ID: 240-151287-12

Date Collected: 06/15/21 00:00

Matrix: Water

Date Received: 06/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	491948	06/23/21 17:58	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 21:24	CS	TAL CAN

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Client Sample ID: VAP-56_8.5-12.5_061521

Lab Sample ID: 240-151287-13

Date Collected: 06/14/21 14:40

Matrix: Water

Date Received: 06/16/21 08:00

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Total/NA	Analysis	8260B		1	491948	06/23/21 18:20	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	491180	06/17/21 21:48	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

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Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP

Job ID: 240-151287-1

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-21
Iowa	State	421	06-01-21 *
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

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

REVISED NOMENCLATURE COC
 APPROVED BY K.HINSKEY
 Address: CW 071421

Chain of Custody Record
 506835
 MICHIGAN
 190

Environment Testing
 TestAmerica

TAL-8210

Regulatory Program: DW NPDES RCRA Other:

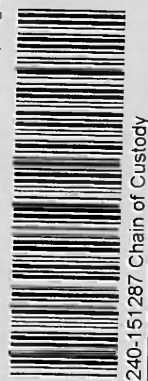
Client Contact
 Company Name: ARCADIS
 Address: 28550 CABOT DRIVE
 City/State/Zip: NOVI MI 48377
 Phone: 248-994-2240
 Fax:
 Project Name: FORD LTP
 Site: LIVONIA
 P O #: 30080612201

Project Manager: KRIS HINSKEY
 Tel/Email: 269-579-5402

Analysis Turnaround Time
 CALENDAR DAYS WORKING DAYS
 TAT if different from Below
 2 weeks STANDARD
 1 week
 2 days
 1 day

Site Contact: CHRISTINA WEAVER
 Lab Contact: MIKE DEWASIG
 Date: 6/14/2021
 Carrier:

COCC No: 1 of 1
 COCS



Sample Identification	Sample Date	Sample Time	Sample Type (C-Comp, G-Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	1,1-DCE (METHOD 8260B)	CIS-1,2-DCE (METHOD 8260B)	TRANS-1,2-DCE (METHOD 8260B)	PCE (METHOD 8260B)	TCE (METHOD 8260B)	ENVYR CHLORIDE (METHOD 8260B)	1,4-DIOXANE (METHOD 8260B-SM)	Lab Sampling:	Walk-in Client:	For Lab Use Only:	Sampler:	COCC No:
VAP-52-15.5-19.5-061421	6/14/21	1035	G	GW	6	N	N	X	X	X	X	X	X	X					1
VAP-52-9.5-13.5-061421	6/14/21	1055	G	GW	6	N	N	X	X	X	X	X	X	X					2
VAP-52-4.5-8.5-061421	6/14/21	1110	G	GW	6	N	N	X	X	X	X	X	X	X					3
VAP-53-19.5-23.5-061421	6/14/21	1425	G	GW	6	N	N	X	X	X	X	X	X	X					4
VAP-53-14-18-061421	6/14/21	1445	G	GW	6	N	N	X	X	X	X	X	X	X					5
VAP-53-9-13-061421	6/14/21	1510	G	GW	6	N	N	X	X	X	X	X	X	X					6
TRIP BLANK-01	6/14/21	-	G	GW	1	N	N	X	X	X	X	X	X	X					7
VAP-54-8-12-061521	6/15/21	0955	G	GW	6	N	N	X	X	X	X	X	X	X					8
VAP-54-5-9-061521	6/15/21	1045	G	GW	6	N	N	X	X	X	X	X	X	X					9
VAP-55-19-23-061521	6/15/21	1355	G	GW	6	N	N	X	X	X	X	X	X	X					10
VAP-55-14-18-061521	6/15/21	1440	G	GW	6	N	N	X	X	X	X	X	X	X					11
TRIP BLANK-01	6/15/21	-	G	GW	6	N	N	X	X	X	X	X	X	X					12

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return to Client Disposal by Lab Archive for _____ Months

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

Possible Hazard Identification:
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
 Non-Hazard Flammable Skin Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments: SUBMIT ALL RESULTS THROUGH CADENA AT JIM.TOMALIA@CADENA.COM
 LEVEL IV REPORTING

Custody Seal No.:	Yes	No	Company:	Date/Time:	Received by:	Company:	Received by:	Company:	Received in Laboratory by:	Company:	Received in Laboratory by:	Company:	Received by:	Company:	Received by:	Company:	Received in Laboratory by:	Company:	Received by:	Company:
	<input type="checkbox"/>	<input type="checkbox"/>	ARCADIS	6/14/21/1700	NOVE COLD STORAGE	ARCADIS	NOVE COLD STORAGE	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS
	<input type="checkbox"/>	<input type="checkbox"/>	ARCADIS	6/15/21/1620	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS	ARCADIS

TAL-8210

Regulatory Program: DW NPDES RCRA Other:

Client Contact: Company Name: **ARCADIS**
 Address: **28550 CABOT DRIVE #202**
 City/State/Zip: **NOVI MI 48377**
 Phone: **248-994-2240**
 Fax: **---**
 Project Name: **SORO LTP**
 Site: **LENOXIA**
 P O # **30080642, 301, 01**

Project Manager: **KELLY WUSKEY**
 Tell/Email: **269-579-5402**

Site Contact: Lab Contact: **MIKE DELMONICO**
 Date: **6/15/21** Carrier:
 COC No.: **2** of **2** COCs

Sampler:
 For Lab Use Only:
 Walk-in Client:
 Lab Sampling:
 Job / SDG No.:

Sample Specific Notes: **3 VOAS 0260 B**
3 VOAS 8260B SIM

Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Sample Specific Notes
6/14/21	1440	G	GW	6	N	N	

Analysis Turnaround Time
 CALENDAR DAYS WORKING DAYS
 TAT if different from Below: **STARBOARD**
 2 weeks 1 week 2 days 1 day

Site Contact: Lab Contact: **MIKE DELMONICO**
 Date: **6/15/21** Carrier:
 COC No.: **2** of **2** COCs

Sampler:
 For Lab Use Only:
 Walk-in Client:
 Lab Sampling:
 Job / SDG No.:

Sample Specific Notes: **3 VOAS 0260 B**
3 VOAS 8260B SIM

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return to Client Disposal by Lab Archive for Months

Possible Hazard Identification:
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
 Non-Hazard Flammable Skin Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments: **SUBMIT ALL RESULTS THROUGH CADEVA @ JIM.TOMALIA@CADEVA.COM**
LEVEL IV REPORTING

Custody Seal No.: Yes No
 Relinquished by: **Chantelle Miller**
 Relinquished by: **ARCADIS**
 Relinquished by: **ARCADIS**
 Relinquished by: **ARCADIS**

Received by: **Jim Tomalia**
 Received by: **JTA**
 Received in Laboratory by: **JTA**

Date/Time: **6/15/21 16:17**
6-16-21 08:00

Therm ID No.:
6-16-21 08:00

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**Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility**

Login # : 151287

Client Arcadis Site Name _____

Cooler unpacked by:

Cooler Received on 6-16-21 Opened on 6-16-21

Justin H


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

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

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other _____

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

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 4.7 °C Corrected Cooler Temp. 4.8 °C
 IR GUN #IR-12 (CF +0.2 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____ Yes No
 -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No NA
 -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
- If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC022887
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials?  ← Larger than this Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # MA Yes No
17. Was a LL Hg or Me Hg trip blank present? Yes No

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

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

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page Samples processed by: _____

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

20. SAMPLE PRESERVATION
 Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____
 VOA Sample Preservation - Date/Time VOAs Frozen: _____