

11/18/2019
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #: 30016344.0002B
Workorder #: 1911208

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 11/11/2019 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott
Project Manager

WORK ORDER #: 1911208

Work Order Summary

CLIENT:	Mr. Jim Tomalia Arcadis U.S., Inc. 28550 Cabot Dr. Suite 500 Novi, MI 48377	BILL TO:	Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129
PHONE:	517-819-0356	P.O. #	30016344
FAX:		PROJECT #	30016344.0002B Ford LTP
DATE RECEIVED:	11/11/2019	CONTACT:	Ausha Scott
DATE COMPLETED:	11/18/2019		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	SSMP-34966STANDISHSTREET-01_1106	TO-15	5.3 "Hg	15.1 psi
02A	SSMP-34966STANDISHSTREET-03_1106	TO-15	3.9 "Hg	15.7 psi
03A	DUP-34966STANDISHSTREET-05_11061	TO-15	3.7 "Hg	15.4 psi
04A	SSMP-34966STANDISHSTREET-02_1106	TO-15	3.5 "Hg	15.7 psi
05A	Lab Blank	TO-15	NA	NA
06A	CCV	TO-15	NA	NA
07A	LCS	TO-15	NA	NA
07AA	LCSD	TO-15	NA	NA

CERTIFIED BY: 

 Technical Director

DATE: 11/18/19

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935

Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)

Accreditation number: CA300005-011, Effective date: 10/18/2019, Expiration date: 10/17/2020.

Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

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LABORATORY NARRATIVE
EPA Method TO-15
Arcadis U.S., Inc.
Workorder# 1911208

Four 1 Liter Summa Canister (100% Certified) samples were received on November 11, 2019. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified may be false positives.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	SSMP-34966STANDISHSTREET-01_1106	Date/Time Analyzed:	11/15/19 11:05 PM
Lab ID:	1911208-01A	Dilution Factor:	2.46
Date/Time Collected:	11/6/19 12:12 PM	Instrument/Filename:	msdj.i / j111522
Media:	1 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.4	3.9	4.9	Not Detected
1,4-Dioxane	123-91-1	3.8	13	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.2	3.9	4.9	Not Detected
Tetrachloroethene	127-18-4	2.2	6.7	8.3	4.0 J
trans-1,2-Dichloroethene	156-60-5	2.8	3.9	4.9	Not Detected
Trichloroethene	79-01-6	2.5	5.3	6.6	Not Detected
Vinyl Chloride	75-01-4	2.2	2.5	3.1	Not Detected

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	93
4-Bromofluorobenzene	460-00-4	70-130	91
Toluene-d8	2037-26-5	70-130	97

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	SSMP-34966STANDISHSTREET-03_1106	Date/Time Analyzed:	11/15/19 11:31 PM
Lab ID:	1911208-02A	Dilution Factor:	2.38
Date/Time Collected:	11/6/19 11:51 AM	Instrument/Filename:	msdj.i / j111523
Media:	1 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.4	3.8	4.7	Not Detected
1,4-Dioxane	123-91-1	3.7	13	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.1	3.8	4.7	Not Detected
Tetrachloroethene	127-18-4	2.2	6.4	8.1	4.0 J
trans-1,2-Dichloroethene	156-60-5	2.7	3.8	4.7	Not Detected
Trichloroethene	79-01-6	2.4	5.1	6.4	Not Detected
Vinyl Chloride	75-01-4	2.2	2.4	3.0	Not Detected

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	93
4-Bromofluorobenzene	460-00-4	70-130	92
Toluene-d8	2037-26-5	70-130	98

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	DUP-34966STANDISHSTREET-05_11061	Date/Time Analyzed:	11/15/19 11:58 PM
Lab ID:	1911208-03A	Dilution Factor:	2.34
Date/Time Collected:	11/6/19 12:00 AM	Instrument/Filename:	msdj.i / j111524
Media:	1 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.4	3.7	4.6	Not Detected
1,4-Dioxane	123-91-1	3.6	13	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.1	3.7	4.6	Not Detected
Tetrachloroethene	127-18-4	2.1	6.3	7.9	Not Detected
trans-1,2-Dichloroethene	156-60-5	2.6	3.7	4.6	Not Detected
Trichloroethene	79-01-6	2.3	5.0	6.3	5.6 J
Vinyl Chloride	75-01-4	2.1	2.4	3.0	Not Detected

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	95
4-Bromofluorobenzene	460-00-4	70-130	91
Toluene-d8	2037-26-5	70-130	103

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	SSMP-34966STANDISHSTREET-02_1106	Date/Time Analyzed:	11/16/19 12:24 AM
Lab ID:	1911208-04A	Dilution Factor:	2.34
Date/Time Collected:	11/6/19 12:27 PM	Instrument/Filename:	msdj.i / j111525
Media:	1 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.4	3.7	4.6	Not Detected
1,4-Dioxane	123-91-1	3.6	13	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.1	3.7	4.6	Not Detected
Tetrachloroethene	127-18-4	2.1	6.3	7.9	Not Detected
trans-1,2-Dichloroethene	156-60-5	2.6	3.7	4.6	Not Detected
Trichloroethene	79-01-6	2.3	5.0	6.3	5.3 J
Vinyl Chloride	75-01-4	2.1	2.4	3.0	Not Detected

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	92
4-Bromofluorobenzene	460-00-4	70-130	89
Toluene-d8	2037-26-5	70-130	100

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	Lab Blank	Date/Time Analyzed:	11/15/19 11:01 AM
Lab ID:	1911208-05A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdj.i / j111506d
Media:	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.59	1.6	2.0	Not Detected
1,4-Dioxane	123-91-1	1.6	5.4	7.2	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.90	1.6	2.0	Not Detected
Tetrachloroethene	127-18-4	0.91	2.7	3.4	Not Detected
trans-1,2-Dichloroethene	156-60-5	1.1	1.6	2.0	Not Detected
Trichloroethene	79-01-6	1.0	2.1	2.7	Not Detected
Vinyl Chloride	75-01-4	0.91	1.0	1.3	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	98
4-Bromofluorobenzene	460-00-4	70-130	83
Toluene-d8	2037-26-5	70-130	100

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	CCV	Date/Time Analyzed:	11/15/19 08:55 AM
Lab ID:	1911208-06A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdj.i / j111502
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	88
1,4-Dioxane	123-91-1	98
cis-1,2-Dichloroethene	156-59-2	102
Tetrachloroethene	127-18-4	96
trans-1,2-Dichloroethene	156-60-5	103
Trichloroethene	79-01-6	92
Vinyl Chloride	75-01-4	98

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	94
4-Bromofluorobenzene	460-00-4	70-130	101
Toluene-d8	2037-26-5	70-130	100

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	LCS	Date/Time Analyzed:	11/15/19 09:20 AM
Lab ID:	1911208-07A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdj.i / j111503
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	89
1,4-Dioxane	123-91-1	101
cis-1,2-Dichloroethene	156-59-2	88
Tetrachloroethene	127-18-4	95
trans-1,2-Dichloroethene	156-60-5	111
Trichloroethene	79-01-6	91
Vinyl Chloride	75-01-4	97

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	90
4-Bromofluorobenzene	460-00-4	70-130	99
Toluene-d8	2037-26-5	70-130	103

* % Recovery is calculated using unrounded analytical results.

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	LCSD	Date/Time Analyzed:	11/15/19 09:44 AM
Lab ID:	1911208-07AA	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdj.i / j111504
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	88
1,4-Dioxane	123-91-1	103
cis-1,2-Dichloroethene	156-59-2	93
Tetrachloroethene	127-18-4	97
trans-1,2-Dichloroethene	156-60-5	115
Trichloroethene	79-01-6	92
Vinyl Chloride	75-01-4	99

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	86
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	101

* % Recovery is calculated using unrounded analytical results.



November 18, 2019

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: 30016344.0002B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics -Folsom
Laboratory submittal: 1911208
Sample date: 2019-11-06
Report received by CADENA: 2019-11-18
Initial Data Verification completed: 2019-11-18
4 Air samples were analyzed for TO-15 parameters.

No data qualifications or sample integrity issues were observed.

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.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

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 Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

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.

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) TO-15 Analysis

SDG #1911208

CADENA Verification Report: 2019-11-18

Analyses Performed By:
Eurofins Air Toxics
Folsom, California

Report #35097R
Review Level: Tier III
Project: 30016344.00007



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 1911208 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		
						TO-15 (Full Scan)	TO-15 (SIM)	MISC
1911208	SSMP-34966STANDISH STREET-01_110619	1911208-01A	Air	11/6/2019		X		
	SSMP-34966STANDISH STREET-03_110619	1911208-02A	Air	11/6/2019		X		
	DUP-34966STANDISH STREET-05_110619	1911208-03A	Air	11/6/2019	SSMP-34966STANDISH STREET-02_110619	X		
	SSMP-34966STANDISH STREET-02_110619	1911208-04A	Air	11/6/2019		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	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Method TO-15 (Full Scan). 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	Return Canister Pressure
USEPA TO-15	Air	30 days from collection to analysis (Canister)	Ambient Temperature	< -2" Hg

All samples were analyzed within the specified holding time and canister return pressure / vacuum criteria.

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 (30%) 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 (30%) and RRF value greater than control limit (0.05).

All compounds associated with the continuing 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 requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than 140% or less than 60% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

DATA REVIEW

5. 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.

6. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 35% for air 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 not greater than five times the RL, a control limit of one times the RL is applied to the difference between the duplicate sample results.

Results (in $\mu\text{g}/\text{m}^3$) for the field duplicate samples are summarized in the following table.

Sample ID / Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
SSMP-34966STANDISHSTREET-02_110619/ DUP-34966STANDISHSTREET-05_110619	Trichloroethene	5.3 J	5.6 J	AC

AC Acceptable

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

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: TO-15 (Full Scan)	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Canister return pressure (<-2"Hg)		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	
Internal standard		X		X	
Field Duplicate Sample RPD		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: Joseph C. Houser

SIGNATURE:



DATE: December 8, 2019

PEER REVIEW: Dennis Capria

DATE: December 12, 2019



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



**NO CORRECTIONS/QUALIFIERS ADDED
TO SAMPLE ANALYSIS DATA SHEETS**



EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	SSMP-34966STANDISHSTREET-01_1106	Date/Time Analyzed:	11/15/19 11:05 PM
Lab ID:	1911208-01A	Dilution Factor:	2.46
Date/Time Collected:	11/6/19 12:12 PM	Instrument/Filename:	msdj.i / j111522
Media:	1 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.4	3.9	4.9	Not Detected
1,4-Dioxane	123-91-1	3.8	13	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.2	3.9	4.9	Not Detected
Tetrachloroethene	127-18-4	2.2	6.7	8.3	4.0 J
trans-1,2-Dichloroethene	156-60-5	2.8	3.9	4.9	Not Detected
Trichloroethene	79-01-6	2.5	5.3	6.6	Not Detected
Vinyl Chloride	75-01-4	2.2	2.5	3.1	Not Detected

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	93
4-Bromofluorobenzene	460-00-4	70-130	91
Toluene-d8	2037-26-5	70-130	97

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	SSMP-34966STANDISHSTREET-03_1106	Date/Time Analyzed:	11/15/19 11:31 PM
Lab ID:	1911208-02A	Dilution Factor:	2.38
Date/Time Collected:	11/6/19 11:51 AM	Instrument/Filename:	msdj.i / j111523
Media:	1 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.4	3.8	4.7	Not Detected
1,4-Dioxane	123-91-1	3.7	13	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.1	3.8	4.7	Not Detected
Tetrachloroethene	127-18-4	2.2	6.4	8.1	4.0 J
trans-1,2-Dichloroethene	156-60-5	2.7	3.8	4.7	Not Detected
Trichloroethene	79-01-6	2.4	5.1	6.4	Not Detected
Vinyl Chloride	75-01-4	2.2	2.4	3.0	Not Detected

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	93
4-Bromofluorobenzene	460-00-4	70-130	92
Toluene-d8	2037-26-5	70-130	98

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	DUP-34966STANDISHSTREET-05_11061	Date/Time Analyzed:	11/15/19 11:58 PM
Lab ID:	1911208-03A	Dilution Factor:	2.34
Date/Time Collected:	11/6/19 12:00 AM	Instrument/Filename:	msdj.i / j111524
Media:	1 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.4	3.7	4.6	Not Detected
1,4-Dioxane	123-91-1	3.6	13	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.1	3.7	4.6	Not Detected
Tetrachloroethene	127-18-4	2.1	6.3	7.9	Not Detected
trans-1,2-Dichloroethene	156-60-5	2.6	3.7	4.6	Not Detected
Trichloroethene	79-01-6	2.3	5.0	6.3	5.6 J
Vinyl Chloride	75-01-4	2.1	2.4	3.0	Not Detected

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	95
4-Bromofluorobenzene	460-00-4	70-130	91
Toluene-d8	2037-26-5	70-130	103

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

Client ID:	SSMP-34966STANDISHSTREET-02_1106	Date/Time Analyzed:	11/16/19 12:24 AM
Lab ID:	1911208-04A	Dilution Factor:	2.34
Date/Time Collected:	11/6/19 12:27 PM	Instrument/Filename:	msdj.i / j111525
Media:	1 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.4	3.7	4.6	Not Detected
1,4-Dioxane	123-91-1	3.6	13	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.1	3.7	4.6	Not Detected
Tetrachloroethene	127-18-4	2.1	6.3	7.9	Not Detected
trans-1,2-Dichloroethene	156-60-5	2.6	3.7	4.6	Not Detected
Trichloroethene	79-01-6	2.3	5.0	6.3	5.3 J
Vinyl Chloride	75-01-4	2.1	2.4	3.0	Not Detected

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	92
4-Bromofluorobenzene	460-00-4	70-130	89
Toluene-d8	2037-26-5	70-130	100

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

PID: _____ Workorder #: _____

1911208

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

Click links below to view:

[Canister Sampling Guide](#)

[Helium Shroud Video](#)

Client: <u>Ford</u>	PID: <u>NA</u>	Special Instructions/Notes: Report ONLY: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting	Turnaround Time (Rush surcharges may apply)	
Project Name: <u>Ford LTP</u>			5 Day Turnaround Time	
Project Manager: <u>Kris Hinskey</u>	P.O.# <u>30016344.0002B</u>		Canister Vacuum/Pressure	
Sampler: <u>antel Johnson, Madison Olend</u>			Requested Analyses	
Site Name: <u>34966 STANDISH</u>				

Lab ID	Sample Identification	Can #	Flow Controller #	Start Sampling Information		Stop Sampling Information		Initial (in Hg)	Final (in Hg)	Lab Use Only		TO-15 (See Special Instructions/Notes)	Do Not Analyze
				Date	Time	Date	Time			Receipt	Final (psig) Gas: N ₂ / He		
01A	SSMP-34966STANDISHSTREET-01_110619	1L2855	23101	11/6/2019	11:59	11/6/2019	12:12	-29.8	-6			X	
02A	SSMP-34966STANDISHSTREET-03_110619	1L3900	23239	11/6/2019	11:38	11/6/2019	11:51	-29.7	-5			X	
03A	DUP-34966STANDISHSTREET-05_110619	1L3117	23254	11/6/2019	--	11/6/2019	--	-29.8	-5.5			X	
04A	SSMP-34966STANDISHSTREET-02_110619	1L2909	1931	11/6/2019	12:13	11/6/2019	12:27	-29.7	-5.5			X	
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Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	11/8/19	1800		11/16/19	0920
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Shipper Name: <u>PCU</u>	Custody Seals Intact?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> None
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Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, of shipping of samples. D.O.T Hotline (800) 467-4922

11/19/2019
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #:
Workorder #: 1911232

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 11/12/2019 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott
Project Manager

WORK ORDER #: 1911232

Work Order Summary

CLIENT:	Mr. Jim Tomalia Arcadis U.S., Inc. 28550 Cabot Dr. Suite 500 Novi, MI 48377	BILL TO:	Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129
PHONE:	517-819-0356	P.O. #	30016344.0002B
FAX:		PROJECT #	Ford LTP
DATE RECEIVED:	11/12/2019	CONTACT:	Ausha Scott
DATE COMPLETED:	11/19/2019		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	AA-34966STANDISHSTREET-01_110619	Modified TO-15	5.1 "Hg	5.1 psi
02A	DUP-34966STANDISHSTREET-01_11061	Modified TO-15	3.9 "Hg	4.9 psi
03A	IAB-34966STANDISHSTREET-01_11061	Modified TO-15	4.9 "Hg	4.5 psi
04A	DUP-34966STANDISHSTREET-02_11061	Modified TO-15	6.9 "Hg	4.9 psi
05A	DUP-34966STANDISHSTREET-03_11061	Modified TO-15	9.4 "Hg	5.2 psi
06A	IAF-34966STANDISHSTREET-01_110619	Modified TO-15	7.1 "Hg	5 psi
07A	IAF-34966STANDISHSTREET-02_110619	Modified TO-15	6.3 "Hg	5.2 psi
08A	DUP-34966STANDISHSTREET-04_11061	Modified TO-15	6.1 "Hg	5.1 psi
09A	Lab Blank	Modified TO-15	NA	NA
10A	CCV	Modified TO-15	NA	NA
11A	LCS	Modified TO-15	NA	NA
11AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: 

 Technical Director

DATE: 11/19/19

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935

Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)

Accreditation number: CA300005-011, Effective date: 10/18/2019, Expiration date: 10/17/2020.

Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, LLC.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
Modified TO-15
Arcadis U.S., Inc.
Workorder# 1911232

Eight 6 Liter Summa Canister (100% Cert Ambient) samples were received on November 12, 2019. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the EATL modifications.

<i>Requirement</i>	<i>TO-15</i>	<i>ATL Modifications</i>
Initial Calibration	</=30% RSD with 2 compounds allowed out to < 40% RSD	</=30% RSD with 4 compounds allowed out to < 40% RSD
Blank and standards	Zero Air	UHP Nitrogen provides a higher purity gas matrix than zero air

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified may be false positives.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	AA-34966STANDISHSTREET-01_110619	Date/Time Analyzed:	11/13/19 09:40 PM
Lab ID:	1911232-01A	Dilution Factor:	1.62
Date/Time Collected:	11/6/19 11:13 AM	Instrument/Filename:	msd22.i / 22111315
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.20	0.26	0.64	Not Detected
1,4-Dioxane	123-91-1	0.11	0.23	0.58	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.066	0.26	0.64	Not Detected
Tetrachloroethene	127-18-4	0.25	0.44	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.11	0.26	0.64	Not Detected
Trichloroethene	79-01-6	0.090	0.35	0.87	Not Detected
Vinyl Chloride	75-01-4	0.058	0.16	0.41	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	110
4-Bromofluorobenzene	460-00-4	70-130	110
Toluene-d8	2037-26-5	70-130	98

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	DUP-34966STANDISHSTREET-01_11061	Date/Time Analyzed:	11/13/19 04:25 PM
Lab ID:	1911232-02A	Dilution Factor:	1.53
Date/Time Collected:	11/6/19 12:00 AM	Instrument/Filename:	msd22.i / 22111308
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.18	0.24	0.61	Not Detected
1,4-Dioxane	123-91-1	0.10	0.22	0.55	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.062	0.24	0.61	Not Detected
Tetrachloroethene	127-18-4	0.24	0.42	1.0	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.10	0.24	0.61	Not Detected
Trichloroethene	79-01-6	0.085	0.33	0.82	Not Detected
Vinyl Chloride	75-01-4	0.054	0.16	0.39	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	109
4-Bromofluorobenzene	460-00-4	70-130	108
Toluene-d8	2037-26-5	70-130	99

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAB-34966STANDISHSTREET-01_110619	Date/Time Analyzed:	11/13/19 05:01 PM
Lab ID:	1911232-03A	Dilution Factor:	1.56
Date/Time Collected:	11/6/19 11:28 AM	Instrument/Filename:	msd22.i / 22111309
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.19	0.25	0.62	Not Detected
1,4-Dioxane	123-91-1	0.10	0.22	0.56	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.064	0.25	0.62	Not Detected
Tetrachloroethene	127-18-4	0.24	0.42	1.0	2.5
trans-1,2-Dichloroethene	156-60-5	0.10	0.25	0.62	Not Detected
Trichloroethene	79-01-6	0.086	0.34	0.84	Not Detected
Vinyl Chloride	75-01-4	0.055	0.16	0.40	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	110
4-Bromofluorobenzene	460-00-4	70-130	107
Toluene-d8	2037-26-5	70-130	99

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	DUP-34966STANDISHSTREET-02_11061	Date/Time Analyzed:	11/13/19 05:37 PM
Lab ID:	1911232-04A	Dilution Factor:	1.73
Date/Time Collected:	11/6/19 12:00 AM	Instrument/Filename:	msd22.i / 22111310
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.21	0.27	0.68	Not Detected
1,4-Dioxane	123-91-1	0.12	0.25	0.62	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.070	0.27	0.68	Not Detected
Tetrachloroethene	127-18-4	0.27	0.47	1.2	2.4
trans-1,2-Dichloroethene	156-60-5	0.11	0.27	0.68	Not Detected
Trichloroethene	79-01-6	0.096	0.37	0.93	Not Detected
Vinyl Chloride	75-01-4	0.062	0.18	0.44	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	111
4-Bromofluorobenzene	460-00-4	70-130	109
Toluene-d8	2037-26-5	70-130	99

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	DUP-34966STANDISHSTREET-03_11061	Date/Time Analyzed:	11/13/19 06:15 PM
Lab ID:	1911232-05A	Dilution Factor:	1.97
Date/Time Collected:	11/6/19 12:00 AM	Instrument/Filename:	msd22.i / 22111311
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.24	0.31	0.78	Not Detected
1,4-Dioxane	123-91-1	0.13	0.28	0.71	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.080	0.31	0.78	Not Detected
Tetrachloroethene	127-18-4	0.30	0.53	1.3	4.6
trans-1,2-Dichloroethene	156-60-5	0.13	0.31	0.78	Not Detected
Trichloroethene	79-01-6	0.11	0.42	1.0	Not Detected
Vinyl Chloride	75-01-4	0.070	0.20	0.50	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	111
4-Bromofluorobenzene	460-00-4	70-130	108
Toluene-d8	2037-26-5	70-130	98

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAF-34966STANDISHSTREET-01_110619	Date/Time Analyzed:	11/13/19 06:52 PM
Lab ID:	1911232-06A	Dilution Factor:	1.76
Date/Time Collected:	11/6/19 11:24 AM	Instrument/Filename:	msd22.i / 22111312
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.21	0.28	0.70	Not Detected
1,4-Dioxane	123-91-1	0.12	0.25	0.63	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.072	0.28	0.70	Not Detected
Tetrachloroethene	127-18-4	0.27	0.48	1.2	4.7
trans-1,2-Dichloroethene	156-60-5	0.12	0.28	0.70	Not Detected
Trichloroethene	79-01-6	0.098	0.38	0.94	Not Detected
Vinyl Chloride	75-01-4	0.062	0.18	0.45	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	111
4-Bromofluorobenzene	460-00-4	70-130	110
Toluene-d8	2037-26-5	70-130	99

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAF-34966STANDISHSTREET-02_110619	Date/Time Analyzed:	11/13/19 07:29 PM
Lab ID:	1911232-07A	Dilution Factor:	1.72
Date/Time Collected:	11/6/19 11:18 AM	Instrument/Filename:	msd22.i / 22111313
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.21	0.27	0.68	Not Detected
1,4-Dioxane	123-91-1	0.12	0.25	0.62	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.070	0.27	0.68	Not Detected
Tetrachloroethene	127-18-4	0.27	0.47	1.2	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.11	0.27	0.68	Not Detected
Trichloroethene	79-01-6	0.095	0.37	0.92	Not Detected
Vinyl Chloride	75-01-4	0.061	0.18	0.44	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	110
4-Bromofluorobenzene	460-00-4	70-130	106
Toluene-d8	2037-26-5	70-130	98

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	DUP-34966STANDISHSTREET-04_11061	Date/Time Analyzed:	11/13/19 08:48 PM
Lab ID:	1911232-08A	Dilution Factor:	1.69
Date/Time Collected:	11/6/19 12:00 AM	Instrument/Filename:	msd22.i / 22111314
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.20	0.27	0.67	Not Detected
1,4-Dioxane	123-91-1	0.11	0.24	0.61	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.069	0.27	0.67	Not Detected
Tetrachloroethene	127-18-4	0.26	0.46	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.11	0.27	0.67	Not Detected
Trichloroethene	79-01-6	0.094	0.36	0.91	Not Detected
Vinyl Chloride	75-01-4	0.060	0.17	0.43	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	108
4-Bromofluorobenzene	460-00-4	70-130	104
Toluene-d8	2037-26-5	70-130	98

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	Lab Blank	Date/Time Analyzed:	11/13/19 11:32 AM
Lab ID:	1911232-09A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd22.i / 22111306a
Media:	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.12	0.16	0.40	Not Detected
1,4-Dioxane	123-91-1	0.068	0.14	0.36	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.041	0.16	0.40	Not Detected
Tetrachloroethene	127-18-4	0.15	0.27	0.68	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.066	0.16	0.40	Not Detected
Trichloroethene	79-01-6	0.055	0.21	0.54	Not Detected
Vinyl Chloride	75-01-4	0.036	0.10	0.26	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	111
4-Bromofluorobenzene	460-00-4	70-130	109
Toluene-d8	2037-26-5	70-130	100

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	CCV	Date/Time Analyzed:	11/13/19 08:23 AM
Lab ID:	1911232-10A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd22.i / 22111302
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	89
1,4-Dioxane	123-91-1	97
cis-1,2-Dichloroethene	156-59-2	91
Tetrachloroethene	127-18-4	93
trans-1,2-Dichloroethene	156-60-5	91
Trichloroethene	79-01-6	94
Vinyl Chloride	75-01-4	88

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	0-0	93
4-Bromofluorobenzene	460-00-4	0-0	98
Toluene-d8	2037-26-5	0-0	99

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	LCS	Date/Time Analyzed:	11/13/19 09:11 AM
Lab ID:	1911232-11A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd22.i / 22111303
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	93
1,4-Dioxane	123-91-1	104
cis-1,2-Dichloroethene	156-59-2	89
Tetrachloroethene	127-18-4	97
trans-1,2-Dichloroethene	156-60-5	106
Trichloroethene	79-01-6	99
Vinyl Chloride	75-01-4	97

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	100
4-Bromofluorobenzene	460-00-4	70-130	98
Toluene-d8	2037-26-5	70-130	101

* % Recovery is calculated using unrounded analytical results.

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	LCSD	Date/Time Analyzed:	11/13/19 10:01 AM
Lab ID:	1911232-11AA	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd22.i / 22111304
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	94
1,4-Dioxane	123-91-1	105
cis-1,2-Dichloroethene	156-59-2	90
Tetrachloroethene	127-18-4	97
trans-1,2-Dichloroethene	156-60-5	106
Trichloroethene	79-01-6	100
Vinyl Chloride	75-01-4	98

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	101
4-Bromofluorobenzene	460-00-4	70-130	94
Toluene-d8	2037-26-5	70-130	100

* % Recovery is calculated using unrounded analytical results.



November 19, 2019

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: 30016344.0002B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics -Folsom
Laboratory submittal: 1911232
Sample date: 2019-11-06
Report received by CADENA: 2019-11-19
Initial Data Verification completed: 2019-11-19
8 Air samples were analyzed for TO-15 parameters.

No data qualifications or sample integrity issues were observed.

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.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

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 Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

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.

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) TO-15 Analysis

SDG #1911232

CADENA Verification Report: 2019-11-19

Analyses Performed By:
Eurofins Air Toxics
Folsom, California

Report #35098R
Review Level: Tier III
Project: 30016344.00007



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 1911232 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		
						TO-15 (Full Scan)	TO-15 (SIM)	MISC
1911232	AA-34966STANDISH STREET-01_110619	1911232-01A	Air	11/6/2019		X		
	DUP-34966STANDISH STREET-01_110619	1911232-02A	Air	11/6/2019	AA-34966STANDISH STREET-01_110619	X		
	IAB-34966STANDISH STREET-01_110619	1911232-03A	Air	11/6/2019		X		
	DUP-34966STANDISH STREET-02_110619	1911232-04A	Air	11/6/2019	IAB-34966STANDISH STREET-01_110619	X		
	DUP-34966STANDISH STREET-03_110619	1911232-05A	Air	11/6/2019	IAF-34966STANDISH STREET-01_110619	X		
	IAF-34966STANDISH STREET-01_110619	1911232-06A	Air	11/6/2019		X		
	IAF-34966STANDISH STREET-02_110619	1911232-07A	Air	11/6/2019		X		

DATA REVIEW

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						TO-15 (Full Scan)	TO-15 (SIM)	MISC
	DUP-34966STANDISH STREET-04_110619	1911232-08A	Air	11/6/2019	IAF-34966STANDISH STREET-02_110619	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	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Method TO-15 (Full Scan). 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	Return Canister Pressure
USEPA TO-15	Air	30 days from collection to analysis (Canister)	Ambient Temperature	< -2" Hg

All samples were analyzed within the specified holding time and canister return pressure / vacuum criteria.

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 (30%) 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 (30%) and RRF value greater than control limit (0.05).

All compounds associated with the continuing 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 requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than 140% or less than 60% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

DATA REVIEW

5. 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.

6. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 35% for air 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 not greater than five times the RL, a control limit of one times the RL is applied to the difference between the duplicate sample results.

Results (in $\mu\text{g}/\text{m}^3$) for the field duplicate samples are summarized in the following table.

Sample ID / Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
AA-34966STANDISHSTREET-01_110619/ DUP-34966STANDISHSTREET-01_110619	All compounds	U	U	AC
IAB-34966STANDISHSTREET-01_110619/ DUP-34966STANDISHSTREET-02_110619	Tetrachloroethene	2.5	2.4	AC
IAF-34966STANDISHSTREET-01_110619/ DUP-34966STANDISHSTREET-03_110619	Tetrachloroethene	4.7	4.6	AC
IAF-34966STANDISHSTREET-02_110619/ DUP-34966STANDISHSTREET-04_110619	All compounds	U	U	AC

AC Acceptable

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

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: TO-15 (Full Scan)	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Canister return pressure (<-2"Hg)		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	
Internal standard		X		X	
Field Duplicate Sample RPD		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: Joseph C. Houser

SIGNATURE:



DATE: December 8, 2019

PEER REVIEW: Dennis Capria

DATE: December 12, 2019



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



**NO CORRECTIONS/QUALIFIERS ADDED
TO SAMPLE ANALYSIS DATA SHEETS**



MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	AA-34966STANDISHSTREET-01_110619	Date/Time Analyzed:	11/13/19 09:40 PM
Lab ID:	1911232-01A	Dilution Factor:	1.62
Date/Time Collected:	11/6/19 11:13 AM	Instrument/Filename:	msd22.i / 22111315
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.20	0.26	0.64	Not Detected
1,4-Dioxane	123-91-1	0.11	0.23	0.58	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.066	0.26	0.64	Not Detected
Tetrachloroethene	127-18-4	0.25	0.44	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.11	0.26	0.64	Not Detected
Trichloroethene	79-01-6	0.090	0.35	0.87	Not Detected
Vinyl Chloride	75-01-4	0.058	0.16	0.41	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	110
4-Bromofluorobenzene	460-00-4	70-130	110
Toluene-d8	2037-26-5	70-130	98

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	DUP-34966STANDISHSTREET-01_11061	Date/Time Analyzed:	11/13/19 04:25 PM
Lab ID:	1911232-02A	Dilution Factor:	1.53
Date/Time Collected:	11/6/19 12:00 AM	Instrument/Filename:	msd22.i / 22111308
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.18	0.24	0.61	Not Detected
1,4-Dioxane	123-91-1	0.10	0.22	0.55	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.062	0.24	0.61	Not Detected
Tetrachloroethene	127-18-4	0.24	0.42	1.0	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.10	0.24	0.61	Not Detected
Trichloroethene	79-01-6	0.085	0.33	0.82	Not Detected
Vinyl Chloride	75-01-4	0.054	0.16	0.39	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	109
4-Bromofluorobenzene	460-00-4	70-130	108
Toluene-d8	2037-26-5	70-130	99

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAB-34966STANDISHSTREET-01_110619	Date/Time Analyzed:	11/13/19 05:01 PM
Lab ID:	1911232-03A	Dilution Factor:	1.56
Date/Time Collected:	11/6/19 11:28 AM	Instrument/Filename:	msd22.i / 22111309
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.19	0.25	0.62	Not Detected
1,4-Dioxane	123-91-1	0.10	0.22	0.56	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.064	0.25	0.62	Not Detected
Tetrachloroethene	127-18-4	0.24	0.42	1.0	2.5
trans-1,2-Dichloroethene	156-60-5	0.10	0.25	0.62	Not Detected
Trichloroethene	79-01-6	0.086	0.34	0.84	Not Detected
Vinyl Chloride	75-01-4	0.055	0.16	0.40	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	110
4-Bromofluorobenzene	460-00-4	70-130	107
Toluene-d8	2037-26-5	70-130	99

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	DUP-34966STANDISHSTREET-02_11061	Date/Time Analyzed:	11/13/19 05:37 PM
Lab ID:	1911232-04A	Dilution Factor:	1.73
Date/Time Collected:	11/6/19 12:00 AM	Instrument/Filename:	msd22.i / 22111310
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.21	0.27	0.68	Not Detected
1,4-Dioxane	123-91-1	0.12	0.25	0.62	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.070	0.27	0.68	Not Detected
Tetrachloroethene	127-18-4	0.27	0.47	1.2	2.4
trans-1,2-Dichloroethene	156-60-5	0.11	0.27	0.68	Not Detected
Trichloroethene	79-01-6	0.096	0.37	0.93	Not Detected
Vinyl Chloride	75-01-4	0.062	0.18	0.44	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	111
4-Bromofluorobenzene	460-00-4	70-130	109
Toluene-d8	2037-26-5	70-130	99

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	DUP-34966STANDISHSTREET-03_11061	Date/Time Analyzed:	11/13/19 06:15 PM
Lab ID:	1911232-05A	Dilution Factor:	1.97
Date/Time Collected:	11/6/19 12:00 AM	Instrument/Filename:	msd22.i / 22111311
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.24	0.31	0.78	Not Detected
1,4-Dioxane	123-91-1	0.13	0.28	0.71	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.080	0.31	0.78	Not Detected
Tetrachloroethene	127-18-4	0.30	0.53	1.3	4.6
trans-1,2-Dichloroethene	156-60-5	0.13	0.31	0.78	Not Detected
Trichloroethene	79-01-6	0.11	0.42	1.0	Not Detected
Vinyl Chloride	75-01-4	0.070	0.20	0.50	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	111
4-Bromofluorobenzene	460-00-4	70-130	108
Toluene-d8	2037-26-5	70-130	98

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAF-34966STANDISHSTREET-01_110619	Date/Time Analyzed:	11/13/19 06:52 PM
Lab ID:	1911232-06A	Dilution Factor:	1.76
Date/Time Collected:	11/6/19 11:24 AM	Instrument/Filename:	msd22.i / 22111312
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.21	0.28	0.70	Not Detected
1,4-Dioxane	123-91-1	0.12	0.25	0.63	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.072	0.28	0.70	Not Detected
Tetrachloroethene	127-18-4	0.27	0.48	1.2	4.7
trans-1,2-Dichloroethene	156-60-5	0.12	0.28	0.70	Not Detected
Trichloroethene	79-01-6	0.098	0.38	0.94	Not Detected
Vinyl Chloride	75-01-4	0.062	0.18	0.45	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	111
4-Bromofluorobenzene	460-00-4	70-130	110
Toluene-d8	2037-26-5	70-130	99

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAF-34966STANDISHSTREET-02_110619	Date/Time Analyzed:	11/13/19 07:29 PM
Lab ID:	1911232-07A	Dilution Factor:	1.72
Date/Time Collected:	11/6/19 11:18 AM	Instrument/Filename:	msd22.i / 22111313
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.21	0.27	0.68	Not Detected
1,4-Dioxane	123-91-1	0.12	0.25	0.62	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.070	0.27	0.68	Not Detected
Tetrachloroethene	127-18-4	0.27	0.47	1.2	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.11	0.27	0.68	Not Detected
Trichloroethene	79-01-6	0.095	0.37	0.92	Not Detected
Vinyl Chloride	75-01-4	0.061	0.18	0.44	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	110
4-Bromofluorobenzene	460-00-4	70-130	106
Toluene-d8	2037-26-5	70-130	98

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	DUP-34966STANDISHSTREET-04_11061	Date/Time Analyzed:	11/13/19 08:48 PM
Lab ID:	1911232-08A	Dilution Factor:	1.69
Date/Time Collected:	11/6/19 12:00 AM	Instrument/Filename:	msd22.i / 22111314
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.20	0.27	0.67	Not Detected
1,4-Dioxane	123-91-1	0.11	0.24	0.61	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.069	0.27	0.67	Not Detected
Tetrachloroethene	127-18-4	0.26	0.46	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.11	0.27	0.67	Not Detected
Trichloroethene	79-01-6	0.094	0.36	0.91	Not Detected
Vinyl Chloride	75-01-4	0.060	0.17	0.43	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	108
4-Bromofluorobenzene	460-00-4	70-130	104
Toluene-d8	2037-26-5	70-130	98

Analysis Request / Canister Chain of Custody

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
 Phone (800) 985-5955; Fax (916) 351-8279

For Laboratory Use Only
 PID: _____ Workorder #: **1911232**

Click links below to view:
[Canister Sampling Guide](#)
[Helium Shroud Video](#)

Client: Ford PID: NA
 Project Name: Ford LTP
 Project Manager: Kris Hinskey P.O.# 30016344.0002B
 Sampler: Madison Olender
 Site Name: 34966 STANDISH

Special Instructions/Notes: Report ONLY: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting

Turnaround Time (Rush surcharges may apply)
 5 Day Turnaround Time

Lab ID	Sample Identification	Can #	Flow Controller #	Start Sampling Information		Stop Sampling Information		Initial (in Hg)	Final (in Hg)	Lab Use Only		Requested Analytes	
				Date	Time	Date	Time			Receipt	Final (psig) Gas: N ₂ / He	TO-15 (See Special Instructions/Notes)	Do Not Analyze
01A	AA-34966STANDISHSTREET-01_110619	6L0213	21928	11/5/2019	12:12	11/6/2019	11:13	-29	-6.5			X	
02A	DUP-34966STANDISHSTREET-01_110619	6L2490	22279	11/5/2019	--	11/6/2019	--	-29	-5.5			X	
03A	IAB-34966STANDISHSTREET-01_110619	6L0916	20477	11/5/2019	12:16	11/6/2019	11:28	-29	-5.5			X	
04A	DUP-34966STANDISHSTREET-02_110619	6L0188	24090	11/5/2019	--	11/6/2019	--	-28.5	-8.5			X	
05A	DUP-34966STANDISHSTREET-03_110619	6L0251	1802	11/5/2019	--	11/6/2019	--	-29	-9.5			X	
06A	IAF-34966STANDISHSTREET-01_110619	6L0489	21383	11/5/2019	12:21	11/6/2019	11:24	-29	-7.5			X	
07A	IAF-34966STANDISHSTREET-02_110619	6L2315	23890	11/5/2019	12:25	11/6/2019	11:18	-29	-7.5			X	
08A	DUP-34966STANDISHSTREET-04_110619	6L1046	20769	11/5/2019	--	11/6/2019	--	-28.5	-7.5			X	
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Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	11/8/19	18:00		11/12/19	10:38
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Shipper Name: JDX Custody Seals Intact? Yes No None

Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, of shipping of samples. D.O.T Hotline (800) 467-4922

ANALYTICAL REPORT

Eurofins TestAmerica, Edison
777 New Durham Road
Edison, NJ 08817
Tel: (732)549-3900

Laboratory Job ID: 460-196188-1
Client Project/Site: Ford LTP Livonia MI - E203631

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

Attn: Kristoffer Hinskey



Authorized for release by:
11/19/2019 12:13:28 PM

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

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

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

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



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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

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

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

Job ID: 460-196188-1

Laboratory: Eurofins TestAmerica, Edison

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203631

Report Number: 460-196188-1

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

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

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

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

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

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

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

RECEIPT

The samples were received on 11/8/2019 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.7° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples SUMP-34966STANDISH-01_110619 (460-196188-1) and TRIP BLANK (460-196188-2) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 11/14/2019.

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

VOLATILE ORGANIC COMPOUNDS (GC/MS)

Sample SUMP-34966STANDISH-01_110619 (460-196188-1) was analyzed for Volatile organic compounds (GC/MS) in accordance with SW-846 Method 8260C SIM. The samples were analyzed on 11/14/2019.

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

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

Client Sample ID: SUMP-34966STANDISH-01_110619

Lab Sample ID: 460-196188-1

No Detections.

Client Sample ID: TRIP BLANK

Lab Sample ID: 460-196188-2

No Detections.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Edison

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

Client Sample ID: SUMP-34966STANDISH-01_110619

Lab Sample ID: 460-196188-1

Date Collected: 11/06/19 11:40

Matrix: Water

Date Received: 11/08/19 09:15

Method: 8260C 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	0.33	ug/L			11/14/19 03:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	101		72 - 133					11/14/19 03:34	1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L			11/14/19 09:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/14/19 09:11	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/14/19 09:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/14/19 09:11	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/14/19 09:11	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/14/19 09:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		74 - 132					11/14/19 09:11	1
Toluene-d8 (Surr)	98		80 - 120					11/14/19 09:11	1
Dibromofluoromethane (Surr)	88		72 - 131					11/14/19 09:11	1
4-Bromofluorobenzene	98		77 - 124					11/14/19 09:11	1

Client Sample ID: TRIP BLANK

Lab Sample ID: 460-196188-2

Date Collected: 11/06/19 11:40

Matrix: Water

Date Received: 11/08/19 09:15

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L			11/14/19 04:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/14/19 04:19	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/14/19 04:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/14/19 04:19	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/14/19 04:19	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/14/19 04:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		74 - 132					11/14/19 04:19	1
Toluene-d8 (Surr)	98		80 - 120					11/14/19 04:19	1
Dibromofluoromethane (Surr)	86		72 - 131					11/14/19 04:19	1
4-Bromofluorobenzene	98		77 - 124					11/14/19 04:19	1

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA (74-132)	TOL (80-120)	DBFM (72-131)	BFB (77-124)
460-196188-1	SUMP-34966STANDISH-01_11i	83	98	88	98
460-196188-2	TRIP BLANK	84	98	86	98
LCS 460-655167/3	Lab Control Sample	85	102	88	102
LCSD 460-655167/4	Lab Control Sample Dup	81	99	85	98
MB 460-655167/7	Method Blank	85	98	87	97

Surrogate Legend

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

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane (Surr)

BFB = 4-Bromofluorobenzene

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB (72-133)
460-196188-1	SUMP-34966STANDISH-01_11i	101
LCS 460-655133/3	Lab Control Sample	94
LCSD 460-655133/4	Lab Control Sample Dup	96
MB 460-655133/8	Method Blank	97

Surrogate Legend

BFB = 4-Bromofluorobenzene

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 460-655167/7
Matrix: Water
Analysis Batch: 655167

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	0.26	ug/L			11/14/19 03:53	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/14/19 03:53	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/14/19 03:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/14/19 03:53	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/14/19 03:53	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/14/19 03:53	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	85		74 - 132		11/14/19 03:53	1
Toluene-d8 (Surr)	98		80 - 120		11/14/19 03:53	1
Dibromofluoromethane (Surr)	87		72 - 131		11/14/19 03:53	1
4-Bromofluorobenzene	97		77 - 124		11/14/19 03:53	1

Lab Sample ID: LCS 460-655167/3
Matrix: Water
Analysis Batch: 655167

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	20.0	17.8		ug/L		89	74 - 123
cis-1,2-Dichloroethene	20.0	18.8		ug/L		94	80 - 120
Tetrachloroethene	20.0	19.4		ug/L		97	78 - 122
trans-1,2-Dichloroethene	20.0	17.8		ug/L		89	79 - 120
Trichloroethene	20.0	17.7		ug/L		88	77 - 120
Vinyl chloride	20.0	17.4		ug/L		87	62 - 138

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	85		74 - 132
Toluene-d8 (Surr)	102		80 - 120
Dibromofluoromethane (Surr)	88		72 - 131
4-Bromofluorobenzene	102		77 - 124

Lab Sample ID: LCSD 460-655167/4
Matrix: Water
Analysis Batch: 655167

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	20.0	17.8		ug/L		89	74 - 123	0	30
cis-1,2-Dichloroethene	20.0	17.9		ug/L		89	80 - 120	5	30
Tetrachloroethene	20.0	19.5		ug/L		97	78 - 122	0	30
trans-1,2-Dichloroethene	20.0	17.4		ug/L		87	79 - 120	3	30
Trichloroethene	20.0	18.1		ug/L		90	77 - 120	2	30
Vinyl chloride	20.0	17.3		ug/L		87	62 - 138	1	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	81		74 - 132
Toluene-d8 (Surr)	99		80 - 120
Dibromofluoromethane (Surr)	85		72 - 131

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

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

Lab Sample ID: LCSD 460-655167/4
 Matrix: Water
 Analysis Batch: 655167

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

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene	98		77 - 124

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

Lab Sample ID: MB 460-655133/8
 Matrix: Water
 Analysis Batch: 655133

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

Analyte	MB	MB								
	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil	Fac
1,4-Dioxane	2.0	U	2.0	0.33	ug/L			11/13/19 22:09		1
Surrogate	MB	MB					Prepared	Analyzed	Dil	Fac
4-Bromofluorobenzene	97		72 - 133					11/13/19 22:09		1

Lab Sample ID: LCS 460-655133/3
 Matrix: Water
 Analysis Batch: 655133

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

Analyte		Spike		LCS	LCS				%Rec.
		Added		Result	Qualifier	Unit	D	%Rec	Limits
1,4-Dioxane		5.00		5.15		ug/L		103	66 - 135
Surrogate	LCS	LCS							
4-Bromofluorobenzene	94		72 - 133						

Lab Sample ID: LCSD 460-655133/4
 Matrix: Water
 Analysis Batch: 655133

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

Analyte		Spike		LCSD	LCSD				%Rec.		RPD
		Added		Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
1,4-Dioxane		5.00		5.67		ug/L		113	66 - 135	10	30
Surrogate	LCSD	LCSD									
4-Bromofluorobenzene	96		72 - 133								

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

GC/MS VOA

Analysis Batch: 655133

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196188-1	SUMP-34966STANDISH-01_110619	Total/NA	Water	8260C SIM	
MB 460-655133/8	Method Blank	Total/NA	Water	8260C SIM	
LCS 460-655133/3	Lab Control Sample	Total/NA	Water	8260C SIM	
LCSD 460-655133/4	Lab Control Sample Dup	Total/NA	Water	8260C SIM	

Analysis Batch: 655167

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196188-1	SUMP-34966STANDISH-01_110619	Total/NA	Water	8260C	
460-196188-2	TRIP BLANK	Total/NA	Water	8260C	
MB 460-655167/7	Method Blank	Total/NA	Water	8260C	
LCS 460-655167/3	Lab Control Sample	Total/NA	Water	8260C	
LCSD 460-655167/4	Lab Control Sample Dup	Total/NA	Water	8260C	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

Client Sample ID: SUMP-34966STANDISH-01_110619

Lab Sample ID: 460-196188-1

Date Collected: 11/06/19 11:40

Matrix: Water

Date Received: 11/08/19 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	655167	11/14/19 09:11	MZS	TAL EDI
Total/NA	Analysis	8260C SIM		1	655133	11/14/19 03:34	DAS	TAL EDI

Client Sample ID: TRIP BLANK

Lab Sample ID: 460-196188-2

Date Collected: 11/06/19 11:40

Matrix: Water

Date Received: 11/08/19 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	655167	11/14/19 04:19	MZS	TAL EDI

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

Laboratory: Eurofins TestAmerica, Edison

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

Authority	Program	Identification Number	Expiration Date
Connecticut	State	PH-0200	09-30-20
DE Haz. Subst. Cleanup Act (HSCA)	State	<cert No.>	12-31-21
Georgia	State	12028 (NJ)	06-30-20
New Jersey	NELAP	12028	06-30-20
New York	NELAP	11452	04-01-20
Pennsylvania	NELAP	68-00522	02-28-20
Rhode Island	State	LAO00132	12-30-19
USDA	US Federal Programs	P330-18-00135	05-03-21

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	02-23-20
Connecticut	State	PH-0590	12-31-19
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-20
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-20
Kansas	NELAP	E-10336	04-30-20
Kentucky (UST)	State	112225	02-23-20
Kentucky (WW)	State	KY98016	12-31-19
Minnesota	NELAP	OH00048	12-31-19
Minnesota (Petrofund)	State Program	3506	07-31-21
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-23-20
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-16-00404	12-28-19
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-20
West Virginia DEP	State	210	12-31-19

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

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

Protocol References:

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

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900



Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
460-196188-1	SUMP-34966STANDISH-01_110619	Water	11/06/19 11:40	11/08/19 09:15	
460-196188-2	TRIP BLANK	Water	11/06/19 11:40	11/08/19 09:15	

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MICHIGAN
190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: N Center - 4101 Shuffel Street NW/ North Canton, OH 44720 / 330-497-9396

Regulatory program: DW NPDES RCRA Other

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City/State/Zip: North, MI 48377
Phone: 248-994-2240

Client Contact
Client Project Manager: Kris Hensley
Telephone: 248-994-2240
Email: kcris@arcadis.com

Site Contact: Angela DeGrandis
Telephone: 734-320-0065

Lab Contact: Mike D'Antonio
Telephone: 330-497-9396

Project Name: Ford LTP

Analysis Laboratory Name

Analyses

Project Number: M1001454-0005

Method of Shipment/Carrier:

TAI if different from below

For lab use only

PO # M1001454-0005

Shipping/Tracking No:

3 Day 1 week 2 days 1 day

Walk-in client

Sample Identification

Sample Date

Sample Time

Matrix

Container & Preservation

Filtrated Sample (Y/N)

Composite=C / Grab=G

Job/SDG No:

Sample Date

Sample Time

Air Aqueous Sediment Solid Other:

Matrix

Container & Preservation

Filtrated Sample (Y/N)

Composite=C / Grab=G

Job/SDG No:

Sample Date

Sample Time

Air Aqueous Sediment Solid Other:

Matrix

Container & Preservation

Filtrated Sample (Y/N)

Composite=C / Grab=G

Job/SDG No:

Sample Date

Sample Time

Air Aqueous Sediment Solid Other:

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Container & Preservation

Filtrated Sample (Y/N)

Composite=C / Grab=G

Job/SDG No:

Sample Date

Sample Time

Air Aqueous Sediment Solid Other:

Matrix

Container & Preservation

Filtrated Sample (Y/N)

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Job/SDG No:

Sample Date

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Air Aqueous Sediment Solid Other:

Matrix

Container & Preservation

Filtrated Sample (Y/N)

Composite=C / Grab=G

Job/SDG No:

Sample Date

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Air Aqueous Sediment Solid Other:

Matrix

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Filtrated Sample (Y/N)

Composite=C / Grab=G

Job/SDG No:

Sample Date

Sample Time

Air Aqueous Sediment Solid Other:

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Air Aqueous Sediment Solid Other:

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Container & Preservation

Filtrated Sample (Y/N)

Composite=C / Grab=G

Job/SDG No:

Sample Date

Sample Time

Air Aqueous Sediment Solid Other:

Matrix

Container & Preservation

Filtrated Sample (Y/N)

Composite=C / Grab=G

Job/SDG No:



5-DAY RUSH

Viastex 12#9 / 7°C seal-1055237

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 460-196188-1

Login Number: 196188

List Number: 1

Creator: Lysy, Susan

List Source: Eurofins TestAmerica, Edison

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	1055237
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	Refer to Job Narrative for details.
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

DATA VERIFICATION REPORT



November 19, 2019

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: MI001454.0003 ? 30016344 - VI sampling
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - Edison
Laboratory submittal: 196188-1
Sample date: 2019-11-06
Report received by CADENA: 2019-11-19
Initial Data Verification completed by CADENA: 2019-11-19
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC and GCMS SVOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, LCS/LCD 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.

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.

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG #460-196188-1

CADENA Verification Report: 2019-11-19

Analyses Performed By:

TestAmerica
Canton, Ohio

Report #35308R

Review Level: Tier III

Project: 30016344.00007



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 460-196188-1 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
460-196188-1	SUMP-34966STANDISH-01_110619	460-196188-1	Water	11/6/2019		X	X	
	TRIP BLANK	460-196188-2	Water	11/6/2019		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	

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	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

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 insure 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.

5. Compound Identification

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

DATA REVIEW

No compounds were detected in the samples within this SDG.

6. 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	
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: December 27, 2019

PEER REVIEW: Dennis Capria

DATE: January 3, 2020



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



**NO CORRECTIONS/QUALIFIERS ADDED
TO SAMPLE ANALYSIS DATA SHEETS**



Chain of Custody Record

TestAmerica Laboratory location: N Canton — 4101 Shafter Street NW, North Canton, OH 44720 / 330-497-9396

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory, Inc
COC No: 190188

Client Contact
Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City/State/Zip: North, MI 48377
Phone: 248-994-2240

Regulatory program: DWR NPDES RCRA Other

Client Project Manager: Kristi Hensky

Telephone: 248-994-2240
Email: kristoffer.hensky@arcadis.com

Site Contact: Angela DeGrandis
Telephone: 734-330-0065

Lab Contact: Mike DeMonte
Telephone: 330-975-9396

Project Name: Ford LTP

Project Number: J4001454.0003

PO # W4001454.0003

Method of Shipment/Carrier:

Shipping/Tracking No.:

Analysis turnaround time:
 3 weeks
 2 weeks
 1 week
 2 days
 1 day

TAT if different from below

Analysis:

Filtered Sample (Y/N)

Composites=C/ Grab=G

1,1-DCE 8260B

cis-1,2-DCE 8260B

Trans-1,2-DCE 8260B

PCE 8260B

TCE 8260B

Vinyl Chloride 8260B

1,4-Dioxane 8260B SIM

Walk-in client

Lab sampling

Job/SDG No.:

Sample Specific Notes / Special Instructions:

Sample ID	Sample Date	Sample Time	Matrix					Analytes								Date/Time		
			Air	Aqueous	Scallment	Solid	Other:	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				
SWP-37668/IN/SH-01-110619		11/6/19 1140	X															
TRP GRANIC																		



5-Day RUSH

6 CONTAINERS - 1
1 CONTAINER - 2

Wastex 12#9 / 7°C Seal-1055237

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 460-196188-1

Client Sample ID: SUMP-34966STANDISH-01_110619

Lab Sample ID: 460-196188-1

Date Collected: 11/06/19 11:40

Matrix: Water

Date Received: 11/08/19 09:15

Method: 8260C 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	0.33	ug/L			11/14/19 03:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	101		72 - 133					11/14/19 03:34	1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L			11/14/19 09:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/14/19 09:11	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/14/19 09:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/14/19 09:11	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/14/19 09:11	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/14/19 09:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		74 - 132					11/14/19 09:11	1
Toluene-d8 (Surr)	98		80 - 120					11/14/19 09:11	1
Dibromofluoromethane (Surr)	88		72 - 131					11/14/19 09:11	1
4-Bromofluorobenzene	98		77 - 124					11/14/19 09:11	1

Client Sample ID: TRIP BLANK

Lab Sample ID: 460-196188-2

Date Collected: 11/06/19 11:40

Matrix: Water

Date Received: 11/08/19 09:15

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L			11/14/19 04:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/14/19 04:19	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/14/19 04:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/14/19 04:19	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/14/19 04:19	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/14/19 04:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		74 - 132					11/14/19 04:19	1
Toluene-d8 (Surr)	98		80 - 120					11/14/19 04:19	1
Dibromofluoromethane (Surr)	86		72 - 131					11/14/19 04:19	1
4-Bromofluorobenzene	98		77 - 124					11/14/19 04:19	1