

## ANALYTICAL REPORT

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

Laboratory Job ID: 460-197369-1  
Client Project/Site: Ford LTP Off-Site

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

Attn: Kristoffer Hinskey



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Authorized for release by:  
12/5/2019 9:25:29 AM

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results through  
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[www.testamericainc.com](http://www.testamericainc.com)

*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 Off-Site

Job ID: 460-197369-1

## 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 Off-Site

Job ID: 460-197369-1

**Job ID: 460-197369-1**

**Laboratory: Eurofins TestAmerica, Edison**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: Ford LTP Off-Site**

**Report Number: 460-197369-1**

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, Edison 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 11/20/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.5° C.

### **VOLATILE ORGANIC COMPOUNDS (GCMS)**

Samples TRIP BLANK (460-197369-1) and MW-154S\_111819 (460-197369-2) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 11/27/2019.

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

### **VOLATILE ORGANIC COMPOUNDS (GC/MS)**

Sample MW-154S\_111819 (460-197369-2) was analyzed for Volatile organic compounds (GC/MS) in accordance with SW-846 Method 8260C SIM. The samples were analyzed on 11/26/2019.

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 Off-Site

Job ID: 460-197369-1

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 460-197369-1**

No Detections.

**Client Sample ID: MW-154S\_111819**

**Lab Sample ID: 460-197369-2**

No Detections.

- 1
- 2
- 3
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This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Edison

# Client Sample Results

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

Job ID: 460-197369-1

## Client Sample ID: TRIP BLANK

Lab Sample ID: 460-197369-1

Date Collected: 11/18/19 17:11

Matrix: Water

Date Received: 11/20/19 09:30

### 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	-		11/27/19 04:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L	-		11/27/19 04:44	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L	-		11/27/19 04:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L	-		11/27/19 04:44	1
Trichloroethene	1.0	U	1.0	0.31	ug/L	-		11/27/19 04:44	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L	-		11/27/19 04:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		74 - 132		11/27/19 04:44	1
Toluene-d8 (Surr)	91		80 - 120		11/27/19 04:44	1
Dibromofluoromethane (Surr)	100		72 - 131		11/27/19 04:44	1
4-Bromofluorobenzene	101		77 - 124		11/27/19 04:44	1

## Client Sample ID: MW-154S\_111819

Lab Sample ID: 460-197369-2

Date Collected: 11/18/19 17:11

Matrix: Water

Date Received: 11/20/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.33	ug/L	-		11/26/19 03:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	92		72 - 133		11/26/19 03:46	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	-		11/27/19 07:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L	-		11/27/19 07:05	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L	-		11/27/19 07:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L	-		11/27/19 07:05	1
Trichloroethene	1.0	U	1.0	0.31	ug/L	-		11/27/19 07:05	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L	-		11/27/19 07:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		74 - 132		11/27/19 07:05	1
Toluene-d8 (Surr)	91		80 - 120		11/27/19 07:05	1
Dibromofluoromethane (Surr)	101		72 - 131		11/27/19 07:05	1
4-Bromofluorobenzene	87		77 - 124		11/27/19 07:05	1

# Surrogate Summary

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

Job ID: 460-197369-1

## 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)
460-197369-1	TRIP BLANK	92	91	100	101
460-197369-2	MW-154S_111819	93	91	101	87
LCS 460-658552/4	Lab Control Sample	91	92	98	102
LCSD 460-658552/5	Lab Control Sample Dup	90	91	97	101
MB 460-658552/9	Method Blank	92	91	99	100

#### 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)
460-197369-2	MW-154S_111819	92
LCS 460-658258/3	Lab Control Sample	102
LCSD 460-658258/4	Lab Control Sample Dup	97
MB 460-658258/9	Method Blank	95

#### Surrogate Legend

BFB = 4-Bromofluorobenzene

# QC Sample Results

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

Job ID: 460-197369-1

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

**Lab Sample ID: MB 460-658552/9**  
**Matrix: Water**  
**Analysis Batch: 658552**

**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			11/26/19 23:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/26/19 23:01	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/26/19 23:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/26/19 23:01	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/26/19 23:01	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/26/19 23:01	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		74 - 132		11/26/19 23:01	1
Toluene-d8 (Surr)	91		80 - 120		11/26/19 23:01	1
Dibromofluoromethane (Surr)	99		72 - 131		11/26/19 23:01	1
4-Bromofluorobenzene	100		77 - 124		11/26/19 23:01	1

**Lab Sample ID: LCS 460-658552/4**  
**Matrix: Water**  
**Analysis Batch: 658552**

**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	22.8		ug/L		114	74 - 123
cis-1,2-Dichloroethene	20.0	19.1		ug/L		96	80 - 120
Tetrachloroethene	20.0	19.6		ug/L		98	78 - 122
trans-1,2-Dichloroethene	20.0	19.7		ug/L		98	79 - 120
Trichloroethene	20.0	18.0		ug/L		90	77 - 120
Vinyl chloride	20.0	20.5		ug/L		103	62 - 138

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	91		74 - 132
Toluene-d8 (Surr)	92		80 - 120
Dibromofluoromethane (Surr)	98		72 - 131
4-Bromofluorobenzene	102		77 - 124

**Lab Sample ID: LCSD 460-658552/5**  
**Matrix: Water**  
**Analysis Batch: 658552**

**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	19.2		ug/L		96	74 - 123	17	30
cis-1,2-Dichloroethene	20.0	17.7		ug/L		89	80 - 120	7	30
Tetrachloroethene	20.0	18.3		ug/L		91	78 - 122	7	30
trans-1,2-Dichloroethene	20.0	18.2		ug/L		91	79 - 120	8	30
Trichloroethene	20.0	16.7		ug/L		83	77 - 120	8	30
Vinyl chloride	20.0	18.0		ug/L		90	62 - 138	13	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		74 - 132
Toluene-d8 (Surr)	91		80 - 120
Dibromofluoromethane (Surr)	97		72 - 131



# QC Sample Results

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

Job ID: 460-197369-1

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

Lab Sample ID: LCSD 460-658552/5  
Matrix: Water  
Analysis Batch: 658552

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

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene	101		77 - 124

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

Lab Sample ID: MB 460-658258/9  
Matrix: Water  
Analysis Batch: 658258

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

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.33	ug/L			11/26/19 00:40	1
Surrogate	MB	MB	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	95		72 - 133					11/26/19 00:40	1

Lab Sample ID: LCS 460-658258/3  
Matrix: Water  
Analysis Batch: 658258

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

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec.	Limits
	Added	Result	Qualifier				Limits	
1,4-Dioxane	5.00	4.55		ug/L		91	66 - 135	
Surrogate	LCS	LCS	Limits				Limits	
4-Bromofluorobenzene	102		72 - 133					

Lab Sample ID: LCSD 460-658258/4  
Matrix: Water  
Analysis Batch: 658258

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

Analyte	Spike	LCSD	LCSD	Unit	D	%Rec	%Rec.	Limits	RPD	RPD
	Added	Result	Qualifier				Limits	RPD	Limit	
1,4-Dioxane	5.00	4.71		ug/L		94	66 - 135	4	30	
Surrogate	LCSD	LCSD	Limits				Limits			
4-Bromofluorobenzene	97		72 - 133							

# QC Association Summary

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

Job ID: 460-197369-1

## GC/MS VOA

### Analysis Batch: 658258

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-197369-2	MW-154S_111819	Total/NA	Water	8260C SIM	
MB 460-658258/9	Method Blank	Total/NA	Water	8260C SIM	
LCS 460-658258/3	Lab Control Sample	Total/NA	Water	8260C SIM	
LCSD 460-658258/4	Lab Control Sample Dup	Total/NA	Water	8260C SIM	

### Analysis Batch: 658552

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-197369-1	TRIP BLANK	Total/NA	Water	8260C	
460-197369-2	MW-154S_111819	Total/NA	Water	8260C	
MB 460-658552/9	Method Blank	Total/NA	Water	8260C	
LCS 460-658552/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 460-658552/5	Lab Control Sample Dup	Total/NA	Water	8260C	

# Lab Chronicle

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

Job ID: 460-197369-1

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 460-197369-1**

**Date Collected: 11/18/19 17:11**

**Matrix: Water**

**Date Received: 11/20/19 09:30**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	658552	11/27/19 04:44	AVM	TAL EDI

**Client Sample ID: MW-154S\_111819**

**Lab Sample ID: 460-197369-2**

**Date Collected: 11/18/19 17:11**

**Matrix: Water**

**Date Received: 11/20/19 09:30**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	658552	11/27/19 07:05	AVM	TAL EDI
Total/NA	Analysis	8260C SIM		1	658258	11/26/19 03:46	KLB	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 Off-Site

Job ID: 460-197369-1

## 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
Massachusetts	State Program	M-NJ312	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 Off-Site

Job ID: 460-197369-1

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 Off-Site

Job ID: 460-197369-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
460-197369-1	TRIP BLANK	Water	11/18/19 17:11	11/20/19 09:30	
460-197369-2	MW-154S_111819	Water	11/18/19 17:11	11/20/19 09:30	

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MICHIGAN  
190

TestAmerica Laboratory location: Brighton --- 10448 Chilton Drive, Suite 200 / Brighton, MI 48116 / 810-223-2763

Chain of Custody Record

Company Name: Arcadis		Client Contact		Regulatory program: <input type="checkbox"/> DW <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> Other		Site Contact: Rachel Bielak		Lab Contact: Mike DeMontico	
Address: 25550 Cabot Drive, Suite 500		Telephone: 248-994-2240		E-mail: kristofer.hinskey@arcadis.com		Telephone: 248-946-6331		Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48317		Project Name: Ford LTR Off-Site		Project Number: 30016346.0002B		PO # 30016346.0002B			
Sample Identification		Sample Date		Sample Time		Air		Date/Time	
TRIP BLANK		---		---		<input checked="" type="checkbox"/>			
MMW-154S-11519		11/18/19		17:11		<input checked="" type="checkbox"/>			

Submit all results through Cadena at jim.tomalia@cadena.com, Cadena #E203631  
Level IV Reporting requested.

Special Instructions: QC Requirements & Comments: \_\_\_\_\_

Company	Date/Time	Received by:	Received in Laboratory by:	Company	Date/Time
Arcadis	11/18/19 18:00	[Signature]	David Cold Storage	Arcadis	11/18/19 18:40
Arcadis	11/18/19 18:40	Molly Murrow		Arcadis	11/18/19 18:40

Requisitioned by: Molly Murrow Company: Arcadis Date/Time: 11/19/19 15:52

Requisitioned by: Paul Parker Company: Arcadis Date/Time: 11/19/19 15:52

Requisitioned by: Molly Murrow Company: Arcadis Date/Time: 11/19/19 15:52

Sample Specific Notes / Special Instructions: TRIP Blank  
3 vials for 8620B  
5 vials for 8670B SIM

480-197369 Chain of Custody

11/18/19 18:00  
11/18/19 18:40  
11/19/19 10:45

via FedEx 11/20/19 9:30

Eurofins TestAmerica Edison  
Receipt Temperature and pH Log

Job Number: 197369

Number of Coolers: \_\_\_\_\_

IR Gun # \_\_\_\_\_

Cooler Temperatures

	RAW	CORRECTED	RAW	CORRECTED	RAW	CORRECTED	RAW	CORRECTED
Cooler #1:	<u>32.8</u> °C	<u>32.5</u> °C	Cooler #4:	°C	°C	Cooler #7:	°C	°C
Cooler #2:	°C	°C	Cooler #5:	°C	°C	Cooler #8:	°C	°C
Cooler #3:	°C	°C	Cooler #6:	°C	°C	Cooler #9:	°C	°C

TALS Sample Number	Ammonia (pH<2)	COD (pH<2)	Nitrate Nitrite (pH<2)	Metals* (pH<2)	Hardness (pH<2)	Pest (pH 5-9)	EPH or QAM (pH<2)	Phenols (pH<2)	Sulfide (pH>9)	TKN (pH<2)	TOC (pH<2)	Total Cyanide (pH>12)	Total Phos (pH<2)	Other	Other

If pH adjustments are required record the information below:

Sample No(s), adjusted: \_\_\_\_\_

Preservative Name/Conc.: \_\_\_\_\_ Volume of Preservative used (ml): \_\_\_\_\_

Lot # of Preservative(s): \_\_\_\_\_ Expiration Date: \_\_\_\_\_

The appropriate Project Manager and Department Manager should be notified about the samples which were pH adjusted.

\* Samples for Metal analysis which are out of compliance must be acidified at least 24 hours prior to analysis.

Initials: ACCP

Date: 11/20/19



## Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 460-197369-1

**Login Number: 197369**

**List Number: 1**

**Creator: Jara, Kelly D**

**List Source: Eurofins TestAmerica, Edison**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	CS #1055341
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	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# DATA VERIFICATION REPORT



December 05, 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: 30016346.0002B  
Event Specific Scope of Work References: Sample COC  
Laboratory: TestAmerica - Edison  
Laboratory submittal: 197369-1  
Sample date: 2019-11-18  
Report received by CADENA: 2019-12-05  
Initial Data Verification completed by CADENA: 2019-12-05  
Number of Samples:2  
Sample Matrices:Water  
Test Categories:GCMS VOC

**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.

## SAMPLING AND ANALYSIS SUMMARY

**CADENA Project ID:** E203631

**Laboratory:** TestAmerica-Edison

**Laboratory Submittal:** 197369-1

Lab Sample ID	Sample ID	Collection Date (mm/yy/dd)	Collection Time (hh:mm:ss)	GCMS VOC Volatiles	GCMS VOC SIM	Comment
4601973691	TRIP BLANK	11/18/2019	5:11:00	X		
4601973692	MW-154S_111819	11/18/2019	5:11:00	X	X	

# Analytical Results Summary

## Reportable Results Only

CADENA Project ID: E203631

Laboratory: TestAmerica - Edison

Laboratory Submittal: 197369-1

Sample Name: TRIP BLANK MW-154S\_111819  
Lab Sample ID: 4601973691 4601973692  
Sample Date: 11/18/2019 11/18/2019

Analyte	Cas No.	Report		Units	Valid Qualifier	Report		Units	Valid Qualifier	
		Result	Limit			Result	Limit			
<b>GC/MS VOC</b>										
<u>OSW-8260C</u>										
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
<b>GC/MS SVOC</b>										
<u>OSW-8260CSIM</u>										
1,4-Dioxane	123-91-1					ND	0.40	ug/l	---	

# Ford Motor Company – Livonia Transmission Project

## DATA REVIEW

### Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG # 460-197369-1

CADENA Verification Report: 2019-12-05

Analyses Performed By:  
TestAmerica  
Edison, New Jersey

Report #35177R  
Review Level: Tier III  
Project: 30016346.00002



## DATA REVIEW

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 460-197369-1 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
460-197369-1	TRIP BLANK	460-197369-1	Water	11/18/2019		X		
	MW-154S_111819	460-197369-2	Water	11/18/2019		X	X	

## DATA REVIEW

### ANALYTICAL DATA PACKAGE DOCUMENTATION

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

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



## DATA REVIEW

### ORGANIC ANALYSIS INTRODUCTION

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

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

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

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

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

## DATA REVIEW

### VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

#### 1. Holding Times

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

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	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, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
Trip Blank MW-154S_111819	CCV %D	1,1-Dichloroethene	+22.6%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

## DATA REVIEW

Initial/Continuing	Criteria	Sample Result	Qualification
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

### 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.

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	
<b>GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)</b>					
<b>Tier II Validation</b>					
Holding times/Preservation		X		X	
<b>Tier III Validation</b>					
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 18, 2019

PEER REVIEW: Dennis Capria

DATE: December 31, 2019



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



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



# MICHIGAN

190 TestAmerica Laboratory location: Brighton --- 10448 Chatham Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

## Chain of Custody Record

TestAmerica  
THE LEADER IN ENVIRONMENTAL TESTING

Client Contact

Company Name: Arcadis

Address: 26550 Cabot Drive, Suite 500

City/State/Zip: Novi, MI, 48317

Phone: 248-994-2240

Project Name: Ford LTR Off-Site

Project Number: 30016346.0002B

PO # 30016346.0002B

Regulatory program:  DW  NPDES  RCRA  Other

Client Project Manager: Kris Hinskey

Telephone: 248-994-2240

Email: krisof@arcadis.com

Site Contact: Rachel Biegak

Telephone: 248-946-6331

Lab Contact: Mike DelMontico

Telephone: 330-497-9396

Sampler Name: Mary Catherine

Method of Shipment/Carrier:  10 day  1 week  2 weeks  3 weeks

Shipping/Tracking No:

Sample Identification

Sample Date

Sample Time

Air  Aqueous  Sediment  Solid  Other:

H2SO4

HNO3

HCl

NaOH

H2O2

Unpres

Other:

Filter as sample (Y/N)

Composite (C)

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

Sample Specific Notes / Special Instructions:   
Trip Blank

3 Vials for 8620B

8670B SS4

MM-154S-11519  
11/18/19 17:11

Reinquisitioned by:	Company:	Date/Time:	Received by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Mary Catherine	Arcadis	11/18/19/1800	Mary Catherine	Arcadis	11/18/19/1800	Mary Catherine	Arcadis	11/18/19/1800
Mary Catherine	Arcadis	11/18/19/1840	Doni Cold Storage	Arcadis	11/18/19/1840	Doni Cold Storage	Arcadis	11/18/19/1840
Mary Catherine	Arcadis	11/19/19/1045	Molly Durson	ARCAL-MI	11/19/19/1045	Molly Durson	ARCAL-MI	11/19/19/1045

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jim.tomalala@cadena.com. Cadena #E203631 Level IV Reporting requested.

5008, TestAmerica Laboratories, Inc.  
Resurgence & Design are divisions of TestAmerica Laboratories, Inc.  
Molly Durson

ARCAL-MI

11/19/19 1045

CS 1055341

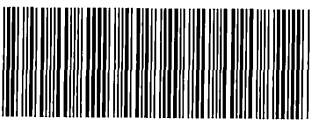
3.2°C RH #11

/3.5.

Angela Punilla

11/20/19 9:30

460-197369 Chain of Custody





# Client Sample Results

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

Job ID: 460-197369-1

## Client Sample ID: TRIP BLANK

Lab Sample ID: 460-197369-1

Date Collected: 11/18/19 17:11

Matrix: Water

Date Received: 11/20/19 09:30

### 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			11/27/19 04:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/27/19 04:44	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/27/19 04:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/27/19 04:44	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/27/19 04:44	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/27/19 04:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		74 - 132		11/27/19 04:44	1
Toluene-d8 (Surr)	91		80 - 120		11/27/19 04:44	1
Dibromofluoromethane (Surr)	100		72 - 131		11/27/19 04:44	1
4-Bromofluorobenzene	101		77 - 124		11/27/19 04:44	1

## Client Sample ID: MW-154S\_111819

Lab Sample ID: 460-197369-2

Date Collected: 11/18/19 17:11

Matrix: Water

Date Received: 11/20/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.40	U	0.40	0.33	ug/L			11/26/19 03:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	92		72 - 133		11/26/19 03:46	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			11/27/19 07:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/27/19 07:05	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/27/19 07:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/27/19 07:05	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/27/19 07:05	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/27/19 07:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		74 - 132		11/27/19 07:05	1
Toluene-d8 (Surr)	91		80 - 120		11/27/19 07:05	1
Dibromofluoromethane (Surr)	101		72 - 131		11/27/19 07:05	1
4-Bromofluorobenzene	87		77 - 124		11/27/19 07:05	1