

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton

4101 Shuffel Street NW

North Canton, OH 44720

Tel: (330)497-9396

TestAmerica Job ID: 240-106466-1

Client Project/Site: Ford LTP Livonia MI - E203631

Revision: 1

For:

ARCADIS U.S., Inc.

28550 Cabot Drive

Suite 500

Novi, Michigan 48377

Attn: Kristoffer Hinskey



Authorized for release by:

1/18/2019 2:18:23 PM

Michael DelMonico, Project Manager I

(330)497-9396

[michael.delmonico@testamericainc.com](mailto:michael.delmonico@testamericainc.com)

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

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

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# Definitions/Glossary

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

TestAmerica Job ID: 240-106466-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
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

TestAmerica Job ID: 240-106466-1

**Job ID: 240-106466-1**

**Laboratory: TestAmerica Canton**

**Narrative**

## CASE NARRATIVE

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

**Project: Ford LTP Livonia MI - E203631**

**Report Number: 240-106466-1**

### Revision

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.

Revised 1/18/2019 - Report was revised to report samples separately.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. 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 TestAmerica and its client.

### **RECEIPT**

The samples were received on 1/3/2019 8:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2° C.

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

Samples MW-118S\_122718 (240-106466-1) and DUP-04 (240-106466-4) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 01/09/2019.

1,2-Dichloroethane-d4 (Surr) and Dibromofluoromethane (Surr) failed the surrogate recovery criteria high for MW-118S\_122718 (240-106466-1) and DUP-04 (240-106466-4). Refer to the QC report for details.

Surrogate recovery for the following samples were outside the upper control limit: MW-118S\_122718 (240-106466-1) and DUP-04 (240-106466-4). These samples did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

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

# Case Narrative

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

TestAmerica Job ID: 240-106466-1

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## Job ID: 240-106466-1 (Continued)

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### Laboratory: TestAmerica Canton (Continued)

#### VOLATILE ORGANIC COMPOUNDS (GCMS SIM)

Samples MW-118S\_122718 (240-106466-1) and DUP-04 (240-106466-4) were analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 01/08/2019 and 01/09/2019.

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

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# Method Summary

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

TestAmerica Job ID: 240-106466-1

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

**Protocol References:**

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

**Laboratory References:**

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



# Sample Summary

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

TestAmerica Job ID: 240-106466-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-106466-1	MW-118S_122718	Water	12/27/18 10:08	01/03/19 08:35
240-106466-4	DUP-04	Water	12/27/18 00:00	01/03/19 08:35

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# Detection Summary

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

TestAmerica Job ID: 240-106466-1

## Client Sample ID: MW-118S\_122718

## Lab Sample ID: 240-106466-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.68	J	1.0	0.20	ug/L	1		8260B	Total/NA

## Client Sample ID: DUP-04

## Lab Sample ID: 240-106466-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.74	J	1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

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# Client Sample Results

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

TestAmerica Job ID: 240-106466-1

**Client Sample ID: MW-118S\_122718**

**Lab Sample ID: 240-106466-1**

**Date Collected: 12/27/18 10:08**

**Matrix: Water**

**Date Received: 01/03/19 08:35**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			01/09/19 13:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		63 - 125					01/09/19 13:36	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			01/09/19 14:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			01/09/19 14:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			01/09/19 14:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			01/09/19 14:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			01/09/19 14:09	1
<b>Vinyl chloride</b>	<b>0.68</b>	<b>J</b>	1.0	0.20	ug/L			01/09/19 14:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	124	X	70 - 121					01/09/19 14:09	1
4-Bromofluorobenzene (Surr)	79		59 - 120					01/09/19 14:09	1
Toluene-d8 (Surr)	105		70 - 123					01/09/19 14:09	1
Dibromofluoromethane (Surr)	132	X	75 - 128					01/09/19 14:09	1

# Client Sample Results

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

TestAmerica Job ID: 240-106466-1

**Client Sample ID: DUP-04**

**Date Collected: 12/27/18 00:00**

**Date Received: 01/03/19 08:35**

**Lab Sample ID: 240-106466-4**

**Matrix: Water**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			01/08/19 17:13	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	89		63 - 125					01/08/19 17:13	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			01/09/19 15:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			01/09/19 15:15	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			01/09/19 15:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			01/09/19 15:15	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			01/09/19 15:15	1
<b>Vinyl chloride</b>	<b>0.74</b>	<b>J</b>	1.0	0.20	ug/L			01/09/19 15:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	121		70 - 121					01/09/19 15:15	1
4-Bromofluorobenzene (Surr)	76		59 - 120					01/09/19 15:15	1
Toluene-d8 (Surr)	102		70 - 123					01/09/19 15:15	1
Dibromofluoromethane (Surr)	133	X	75 - 128					01/09/19 15:15	1

# Surrogate Summary

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

TestAmerica Job ID: 240-106466-1

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (70-121)	BFB (59-120)	TOL (70-123)	DBFM (75-128)
240-106466-1	MW-118S_122718	124 X	79	105	132 X
240-106466-4	DUP-04	121	76	102	133 X
240-106490-C-2 MS	Matrix Spike	102	103	115	111
240-106490-D-2 MSD	Matrix Spike Duplicate	97	102	109	111
LCS 240-363363/4	Lab Control Sample	77	84	90	90
MB 240-363363/6	Method Blank	90	59	76	99

### Surrogate Legend

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

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)
		DCA (63-125)
240-106466-1	MW-118S_122718	86
240-106466-4	DUP-04	89
240-106466-B-3 MS	Matrix Spike	85
240-106466-B-3 MSD	Matrix Spike Duplicate	90
500-156985-D-2 MS	Matrix Spike	92
500-156985-D-2 MSD	Matrix Spike Duplicate	88
LCS 240-363200/12	Lab Control Sample	85
LCS 240-363382/4	Lab Control Sample	85
MB 240-363200/13	Method Blank	86
MB 240-363382/5	Method Blank	87

### Surrogate Legend

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

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)
		DCA (10-150)
MRL 240-363200/14	Lab Control Sample	87

### Surrogate Legend

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

# QC Sample Results

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

TestAmerica Job ID: 240-106466-1

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

**Lab Sample ID: MB 240-363363/6**

**Matrix: Water**

**Analysis Batch: 363363**

**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	0.19	ug/L			01/09/19 11:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			01/09/19 11:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			01/09/19 11:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			01/09/19 11:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			01/09/19 11:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			01/09/19 11:35	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	90		70 - 121		01/09/19 11:35	1
4-Bromofluorobenzene (Surr)	59		59 - 120		01/09/19 11:35	1
Toluene-d8 (Surr)	76		70 - 123		01/09/19 11:35	1
Dibromofluoromethane (Surr)	99		75 - 128		01/09/19 11:35	1

**Lab Sample ID: LCS 240-363363/4**

**Matrix: Water**

**Analysis Batch: 363363**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.5		ug/L		125	65 - 139
cis-1,2-Dichloroethene	10.0	10.4		ug/L		104	76 - 128
Tetrachloroethene	10.0	10.4		ug/L		104	74 - 130
trans-1,2-Dichloroethene	10.0	11.2		ug/L		112	78 - 133
Trichloroethene	10.0	9.41		ug/L		94	76 - 125
Vinyl chloride	10.0	8.80		ug/L		88	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	77		70 - 121
4-Bromofluorobenzene (Surr)	84		59 - 120
Toluene-d8 (Surr)	90		70 - 123
Dibromofluoromethane (Surr)	90		75 - 128

**Lab Sample ID: 240-106490-C-2 MS**

**Matrix: Water**

**Analysis Batch: 363363**

**Client Sample ID: Matrix Spike**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.22		ug/L		82	53 - 140
cis-1,2-Dichloroethene	1.0	U	10.0	8.95		ug/L		90	64 - 130
Tetrachloroethene	1.0	U	10.0	9.11		ug/L		91	51 - 136
trans-1,2-Dichloroethene	1.0	U	10.0	9.19		ug/L		92	68 - 133
Trichloroethene	0.54	J	10.0	8.43		ug/L		79	55 - 131
Vinyl chloride	1.0	U	10.0	9.66		ug/L		97	43 - 154

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	102		70 - 121
4-Bromofluorobenzene (Surr)	103		59 - 120
Toluene-d8 (Surr)	115		70 - 123

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# QC Sample Results

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

TestAmerica Job ID: 240-106466-1

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

**Lab Sample ID: 240-106490-C-2 MS**  
**Matrix: Water**  
**Analysis Batch: 363363**

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

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	111		75 - 128

**Lab Sample ID: 240-106490-D-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 363363**

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

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
	Result	Qualifier		Result	Qualifier						
1,1-Dichloroethene	1.0	U	10.0	8.37		ug/L		84	53 - 140	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.67		ug/L		87	64 - 130	3	21
Tetrachloroethene	1.0	U	10.0	8.99		ug/L		90	51 - 136	1	23
trans-1,2-Dichloroethene	1.0	U	10.0	9.33		ug/L		93	68 - 133	1	24
Trichloroethene	0.54	J	10.0	8.30		ug/L		78	55 - 131	2	23
Vinyl chloride	1.0	U	10.0	9.31		ug/L		93	43 - 154	4	29

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	97		70 - 121
4-Bromofluorobenzene (Surr)	102		59 - 120
Toluene-d8 (Surr)	109		70 - 123
Dibromofluoromethane (Surr)	111		75 - 128

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

**Lab Sample ID: MB 240-363200/13**  
**Matrix: Water**  
**Analysis Batch: 363200**

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

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			01/08/19 16:23	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	86		63 - 125		01/08/19 16:23	1

**Lab Sample ID: LCS 240-363200/12**  
**Matrix: Water**  
**Analysis Batch: 363200**

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

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
1,4-Dioxane	10.0	11.8		ug/L		118	59 - 131

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	85		63 - 125

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# QC Sample Results

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

TestAmerica Job ID: 240-106466-1

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

**Lab Sample ID: MRL 240-363200/14**  
**Matrix: Water**  
**Analysis Batch: 363200**

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

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	0.00100	0.00105	J	ng/uL		105	10 - 150
Surrogate	MRL %Recovery	MRL Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	87		10 - 150				

**Lab Sample ID: 500-156985-D-2 MS**  
**Matrix: Water**  
**Analysis Batch: 363200**

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	12.5		ug/L		125	52 - 129
Surrogate	MS %Recovery	MS Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	92		63 - 125						

**Lab Sample ID: 500-156985-D-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 363200**

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	11.7		ug/L		117	52 - 129	7	13
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	88		63 - 125								

**Lab Sample ID: MB 240-363382/5**  
**Matrix: Water**  
**Analysis Batch: 363382**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			01/09/19 12:46	1	
Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac				
1,2-Dichloroethane-d4 (Surr)	87		63 - 125		01/09/19 12:46	1				

**Lab Sample ID: LCS 240-363382/4**  
**Matrix: Water**  
**Analysis Batch: 363382**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	12.0		ug/L		120	59 - 131
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	85		63 - 125				

TestAmerica Canton

# QC Sample Results

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

TestAmerica Job ID: 240-106466-1

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

**Lab Sample ID: 240-106466-B-3 MS**  
**Matrix: Water**  
**Analysis Batch: 363382**

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	12.1		ug/L		121	52 - 129
<b>MS MS</b>									
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>						
1,2-Dichloroethane-d4 (Surr)	85		63 - 125						

**Lab Sample ID: 240-106466-B-3 MSD**  
**Matrix: Water**  
**Analysis Batch: 363382**

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	11.5		ug/L		115	52 - 129	5	13
<b>MSD MSD</b>											
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>								
1,2-Dichloroethane-d4 (Surr)	90		63 - 125								

# QC Association Summary

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

TestAmerica Job ID: 240-106466-1

## GC/MS VOA

### Analysis Batch: 363200

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-106466-4	DUP-04	Total/NA	Water	8260B SIM	
MB 240-363200/13	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-363200/12	Lab Control Sample	Total/NA	Water	8260B SIM	
MRL 240-363200/14	Lab Control Sample	Total/NA	Water	8260B SIM	
500-156985-D-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
500-156985-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

### Analysis Batch: 363363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-106466-1	MW-118S_122718	Total/NA	Water	8260B	
240-106466-4	DUP-04	Total/NA	Water	8260B	
MB 240-363363/6	Method Blank	Total/NA	Water	8260B	
LCS 240-363363/4	Lab Control Sample	Total/NA	Water	8260B	
240-106490-C-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-106490-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

### Analysis Batch: 363382

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-106466-1	MW-118S_122718	Total/NA	Water	8260B SIM	
MB 240-363382/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-363382/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-106466-B-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-106466-B-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	



# Lab Chronicle

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

TestAmerica Job ID: 240-106466-1

**Client Sample ID: MW-118S\_122718**

**Date Collected: 12/27/18 10:08**

**Date Received: 01/03/19 08:35**

**Lab Sample ID: 240-106466-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	363363	01/09/19 14:09	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	363382	01/09/19 13:36	SAM	TAL CAN

**Client Sample ID: DUP-04**

**Date Collected: 12/27/18 00:00**

**Date Received: 01/03/19 08:35**

**Lab Sample ID: 240-106466-4**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	363363	01/09/19 15:15	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	363200	01/08/19 17:13	SAM	TAL CAN

#### Laboratory References:

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

# Accreditation/Certification Summary

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


TestAmerica Job ID: 240-106466-1

## Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19 *
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	04-30-19
Kentucky (UST)	State Program	4	58	02-23-19 *
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19 *
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19 *
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

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

<b>Client Information</b>		Sampler: <u>Jon Lus +</u>		Lab PM: <u>DeiMonico, Michael</u>		Carrier Tracking No(s): <u>240-56713-24439.8</u>			
Client Contact: <u>Angela DeGrandis</u>		Phone: <u>248-804-8795</u>		E-Mail: <u>michael.deimonico@testamericainc.com</u>		Page: <u>Page 8 of 13</u>			
Company: <u>ARCADIS U.S., Inc.</u>		Due Date Requested:		Analysis Requested		Job #:			
Address: <u>28550 Cabot Drive Suite 500</u>		TAT Requested (days): <u>Standard</u>		Field Filtered Sample (Yes or No)		Preservation Codes:			
City: <u>Novi</u>		PO #: <u>M1001454.0003</u>		Perform MS/MSD (Yes or No)		A - HCL M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Nitric Acid R - NaHSO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)			
State, Zip: <u>MI, 48377</u>		WO #: <u>Cadena #: E203631</u>		8260B - VOCs (Short List)		Other:			
Phone: <u></u>		Project #: <u>24015353</u>		8260B - SIM - Local Method					
Email: <u>angela.degrandis@arcadis-us.com</u>		SSOW#: <u></u>		Total Number of Containers		Special Instructions/Note:			
Project Name: <u>Ford LTP Livonia MI - E203631</u>		Site: <u></u>							
Site: <u></u>									
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, BT=leachate, A=air)	Preservation Code	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260B - VOCs (Short List)	8260B - SIM - Local Method
<u>MW-1185-122718</u>	<u>12-27-18</u>	<u>1008</u>	<u>G</u>	<u>Water</u>	<u>A</u>	<u>X</u>	<u>A</u>	<u>3</u>	<u>3</u>
<u>MW-1185-122718</u>	<u>12-27-18</u>	<u>1200</u>	<u>G</u>	<u>Water</u>	<u>A</u>	<u>X</u>	<u>A</u>	<u>3</u>	<u>3</u>
<u>MW-1215-122718</u>	<u>12-27-18</u>	<u>1350</u>	<u>G</u>	<u>Water</u>	<u>A</u>	<u>X</u>	<u>A</u>	<u>3</u>	<u>3</u>
<u>DUP-04</u>	<u>12-27-18</u>	<u>-</u>	<u>G</u>	<u>Water</u>	<u>A</u>	<u>X</u>	<u>A</u>	<u>3</u>	<u>3</u>
				<u>Water</u>					
				<u>Water</u>					
				<u>Water</u>					
				<u>Water</u>					
				<u>Water</u>					
				<u>Water</u>					
				<u>Water</u>					
				<u>Water</u>					
 240-106466 Chain of Custody									
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: <input type="checkbox"/> I, <input type="checkbox"/> II, <input checked="" type="checkbox"/> III, <input type="checkbox"/> Other (specify)									
Empty Kit Relinquished by: _____ Date: _____ Relinquished by: <u>Jon Lus +</u> Date/Time: <u>12-24-18 / 1520</u> Company: <u>ARCADIS</u> Relinquished by: <u>NAVI cold storage / Dawn Ware</u> Date/Time: <u>1/2/19 1138</u> Company: <u>ARCADIS</u> Relinquished by: <u>Wil</u> Date/Time: <u>1/2/19 1322</u> Company: <u>TAL</u> Custody Seal No.: <u>Yes</u> <input type="checkbox"/> <u>No</u> <input checked="" type="checkbox"/> Custody Seal No.: _____									
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/OC Requirements: <u>Analysis for the following: 1,1 DCE, 1,1,1 TCE, 1,1,2,2 TCE, 1,1,2,2 DCE, 1,1,2,2 DCE</u> Method of Shipment: _____ Received by: <u>NAVI cold storage</u> Date/Time: <u>12-27-18 / 1520</u> Company: <u>ARCADIS</u> Received by: <u>Wil</u> Date/Time: <u>1/2/19 1138</u> Company: <u>TAL</u> Received by: <u>Wil</u> Date/Time: <u>1/3/19 835</u> Company: <u>TAL</u> Cooler Temperature(s) and Other Remarks: _____									

TestAmerica Canton Sample Receipt Form/Narrative

Login # : 106466

Canton Facility

Client Accuris Site Name Cooler unpacked by: Cooler Received on 1/3/19 Opened on 1/3/19

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

TestAmerica Cooler # Packing material used: Bubble Wrap, Foam, Plastic Bag COOLANT: Wet Ice, Blue Ice, Dry Ice, Water, None

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

Contacted PM Date by via Verbal Voice Mail Other Concerning

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by: JR.

18. SAMPLE CONDITION Sample(s) were received after the recommended holding time had expired.

19. SAMPLE PRESERVATION Sample(s) were further preserved in the laboratory. Time preserved: Preservative(s) added/Lot number(s):





REVISED REPORT: January 18, 2019

REVISION SUMMARY: Original lab submittal was separated into location specific reports.

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: MI001454.0002/3/4.00002/2B/3B

Client project scope reference: Client project scope references (permit, SAPP, QAPP, SOW, laboratory quote) relevant to this sampling event were NOT made available through the CLMS project profile so were not utilized for this data verification. Sample COC only was used to define project analytical requirements.

Laboratory: TestAmerica - North Canton

Laboratory submittal: 106466-1

Sample date: 2018-12-27

Report received by CADENA: 2019-01-18

Initial Data Verification completed by CADENA: 2019-01-18

The following minor QC exceptions or missing information were noted:

SUR - GCMS VOC surrogate recoveries were outside of laboratory control limits biased HIGH for at least 1 surrogate. These client sample results that were detected for the analytical fraction specified should be considered to be estimated and qualified with J flags (non-detect results do not require qualification): GCMS VOC samples -001, -004.

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.

2 Water sample(s) were analyzed for GCMS VOC parameter(s).

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

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 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.

# Analytical Results Summary

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 106466-1

Sample Name: MW-118S\_122718

DUP-04

Lab Sample ID: 2401064661

2401064664

Sample Date: 12/27/2018

12/27/2018

Analyte	Cas No.	Report			Valid		Report			Valid	
		Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier		
<b>GC/MS VOC</b>											
<u>OSW-8260B</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	0.68	1.0	ug/l	J	0.74	1.0	ug/l	J		
<u>OSW-8260BBSim</u>											
1,4-Dioxane	123-91-1	ND	2.0	ug/l	---	ND	2.0	ug/l	---		