

ANALYTICAL REPORT

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

Laboratory Job ID: 240-112949-1

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:
6/4/2019 2:19:41 PM

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

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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: 240-112949-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
U	Indicates the analyte was analyzed for but not detected.
X	Surrogate is outside control limits

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

Job ID: 240-112949-1

Job ID: 240-112949-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203631

Report Number: 240-112949-1

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 5/20/2019 3:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.6° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-106S_051619 (240-112949-1), MW-138S_051619 (240-112949-2) and TRIP BLANK (240-112949-3) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 05/26/2019, 05/28/2019 and 05/30/2019.

1,2-Dichloroethane-d4 (Surr) failed the surrogate recovery criteria high for MW-106S_051619 (240-112949-1), MW-138S_051619 (240-112949-2), and MB 240-383174/6.

1,2-Dichloroethane-d4 (Surr) and Dibromofluoromethane (Surr) failed the surrogate recovery criteria high for TRIP BLANK (240-112949-3) and MB 240-383285/6. Refer to the QC report for details.

Surrogate recovery for the following samples was outside the upper control limit. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed: MW-106S_051619 (240-112949-1), (MB 240-383174/6), MW-138S_051619 (240-112949-2), TRIP BLANK (240-112949-3) and (MB 240-383285/6).

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

Job ID: 240-112949-1

Job ID: 240-112949-1 (Continued)

Laboratory: Eurofins TestAmerica, Canton (Continued)

VOLATILE ORGANIC COMPOUNDS (GCMS SIM)

Samples MW-106S_051619 (240-112949-1) and MW-138S_051619 (240-112949-2) were analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 05/23/2019.

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

Job ID: 240-112949-1

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

Protocol References:

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

Laboratory References:

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

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Sample Summary

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

Job ID: 240-112949-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-112949-1	MW-106S_051619	Water	05/16/19 16:20	05/20/19 15:30	
240-112949-2	MW-138S_051619	Water	05/16/19 12:10	05/20/19 15:30	
240-112949-3	TRIP BLANK	Water	05/16/19 00:00	05/20/19 15:30	

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- 13
- 14

Detection Summary

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

Job ID: 240-112949-1

Client Sample ID: MW-106S_051619

Lab Sample ID: 240-112949-1

No Detections.

Client Sample ID: MW-138S_051619

Lab Sample ID: 240-112949-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.6		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-112949-3

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton



Client Sample Results

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

Job ID: 240-112949-1

Client Sample ID: MW-106S_051619

Lab Sample ID: 240-112949-1

Date Collected: 05/16/19 16:20

Matrix: Water

Date Received: 05/20/19 15:30

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	-		05/23/19 15:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	107		63 - 125		05/23/19 15:17	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	-		05/26/19 23:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L	-		05/26/19 23:59	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L	-		05/26/19 23:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L	-		05/26/19 23:59	1
Trichloroethene	1.0	U	1.0	0.10	ug/L	-		05/26/19 23:59	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L	-		05/26/19 23:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	132	X	70 - 121		05/26/19 23:59	1
4-Bromofluorobenzene (Surr)	75		59 - 120		05/26/19 23:59	1
Toluene-d8 (Surr)	100		70 - 123		05/26/19 23:59	1
Dibromofluoromethane (Surr)	123		75 - 128		05/26/19 23:59	1

Client Sample Results

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

Job ID: 240-112949-1

Client Sample ID: MW-138S_051619

Lab Sample ID: 240-112949-2

Date Collected: 05/16/19 12:10

Matrix: Water

Date Received: 05/20/19 15:30

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			05/23/19 16:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	107		63 - 125		05/23/19 16:31	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			05/28/19 22:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/28/19 22:34	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/28/19 22:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/28/19 22:34	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/28/19 22:34	1
Vinyl chloride	1.6		1.0	0.20	ug/L			05/30/19 18:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	126	X	70 - 121		05/28/19 22:34	1
1,2-Dichloroethane-d4 (Surr)	110		70 - 121		05/30/19 18:35	1
4-Bromofluorobenzene (Surr)	76		59 - 120		05/28/19 22:34	1
4-Bromofluorobenzene (Surr)	101		59 - 120		05/30/19 18:35	1
Toluene-d8 (Surr)	100		70 - 123		05/28/19 22:34	1
Toluene-d8 (Surr)	89		70 - 123		05/30/19 18:35	1
Dibromofluoromethane (Surr)	127		75 - 128		05/28/19 22:34	1
Dibromofluoromethane (Surr)	103		75 - 128		05/30/19 18:35	1

Client Sample Results

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

Job ID: 240-112949-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-112949-3

Date Collected: 05/16/19 00:00

Matrix: Water

Date Received: 05/20/19 15:30

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			05/28/19 22:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/28/19 22:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/28/19 22:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/28/19 22:56	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/28/19 22:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/28/19 22:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	134	X	70 - 121		05/28/19 22:56	1
4-Bromofluorobenzene (Surr)	78		59 - 120		05/28/19 22:56	1
Toluene-d8 (Surr)	103		70 - 123		05/28/19 22:56	1
Dibromofluoromethane (Surr)	130	X	75 - 128		05/28/19 22:56	1

Surrogate Summary

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

Job ID: 240-112949-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (70-121)	BFB (59-120)	TOL (70-123)	DBFM (75-128)
240-112863-A-10 MS	Matrix Spike	113	107	116	110
240-112863-C-10 MSD	Matrix Spike Duplicate	109	105	114	105
240-112949-1	MW-106S_051619	132 X	75	100	123
240-112949-1 MS	MW-106S_051619	111	105	116	112
240-112949-1 MSD	MW-106S_051619	116	110	122	116
240-112949-2	MW-138S_051619	126 X	76	100	127
240-112949-2	MW-138S_051619	110	101	89	103
240-112949-3	TRIP BLANK	134 X	78	103	130 X
240-112957-B-1 MS	Matrix Spike	103	102	92	100
240-112957-C-1 MSD	Matrix Spike Duplicate	107	105	95	119
LCS 240-383174/4	Lab Control Sample	107	107	116	107
LCS 240-383285/4	Lab Control Sample	109	107	114	113
LCS 240-383729/4	Lab Control Sample	106	93	93	113
MB 240-383174/6	Method Blank	123 X	80	104	117
MB 240-383285/6	Method Blank	144 X	91	117	137 X
MB 240-383729/6	Method Blank	107	96	91	110

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

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA
		(63-125)
240-112949-1	MW-106S_051619	107
240-112949-1 MS	MW-106S_051619	110
240-112949-1 MSD	MW-106S_051619	108
240-112949-2	MW-138S_051619	107
LCS 240-382740/4	Lab Control Sample	108
MB 240-382740/5	Method Blank	107

Surrogate Legend

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

QC Sample Results

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

Job ID: 240-112949-1

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

Lab Sample ID: MB 240-383174/6
Matrix: Water
Analysis Batch: 383174

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			05/26/19 16:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/26/19 16:42	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/26/19 16:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/26/19 16:42	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/26/19 16:42	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/26/19 16:42	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	123	X	70 - 121		05/26/19 16:42	1
4-Bromofluorobenzene (Surr)	80		59 - 120		05/26/19 16:42	1
Toluene-d8 (Surr)	104		70 - 123		05/26/19 16:42	1
Dibromofluoromethane (Surr)	117		75 - 128		05/26/19 16:42	1

Lab Sample ID: LCS 240-383174/4
Matrix: Water
Analysis Batch: 383174

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	7.94		ug/L		79	65 - 139
cis-1,2-Dichloroethene	10.0	9.67		ug/L		97	76 - 128
Tetrachloroethene	10.0	8.80		ug/L		88	74 - 130
trans-1,2-Dichloroethene	10.0	10.2		ug/L		102	78 - 133
Trichloroethene	10.0	7.94		ug/L		79	76 - 125
Vinyl chloride	10.0	9.10		ug/L		91	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	107		70 - 121
4-Bromofluorobenzene (Surr)	107		59 - 120
Toluene-d8 (Surr)	116		70 - 123
Dibromofluoromethane (Surr)	107		75 - 128

Lab Sample ID: 240-112949-1 MS
Matrix: Water
Analysis Batch: 383174

Client Sample ID: MW-106S_051619
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	8.18		ug/L		82	53 - 140
cis-1,2-Dichloroethene	1.0	U	10.0	9.63		ug/L		96	64 - 130
Tetrachloroethene	1.0	U	10.0	8.42		ug/L		84	51 - 136
trans-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	68 - 133
Trichloroethene	1.0	U	10.0	7.92		ug/L		79	55 - 131
Vinyl chloride	1.0	U	10.0	8.76		ug/L		88	43 - 154

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	111		70 - 121
4-Bromofluorobenzene (Surr)	105		59 - 120
Toluene-d8 (Surr)	116		70 - 123

QC Sample Results

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

Job ID: 240-112949-1

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

Lab Sample ID: 240-112949-1 MS
Matrix: Water
Analysis Batch: 383174

Client Sample ID: MW-106S_051619
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	112		75 - 128

Lab Sample ID: 240-112949-1 MSD
Matrix: Water
Analysis Batch: 383174

Client Sample ID: MW-106S_051619
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.01		ug/L		90	53 - 140	10	35
cis-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	64 - 130	6	21
Tetrachloroethene	1.0	U	10.0	8.96		ug/L		90	51 - 136	6	23
trans-1,2-Dichloroethene	1.0	U	10.0	11.0		ug/L		110	68 - 133	7	24
Trichloroethene	1.0	U	10.0	8.37		ug/L		84	55 - 131	6	23
Vinyl chloride	1.0	U	10.0	9.62		ug/L		96	43 - 154	9	29

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	116		70 - 121
4-Bromofluorobenzene (Surr)	110		59 - 120
Toluene-d8 (Surr)	122		70 - 123
Dibromofluoromethane (Surr)	116		75 - 128

Lab Sample ID: MB 240-383285/6
Matrix: Water
Analysis Batch: 383285

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			05/28/19 15:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/28/19 15:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/28/19 15:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/28/19 15:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/28/19 15:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/28/19 15:39	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	144	X	70 - 121		05/28/19 15:39	1
4-Bromofluorobenzene (Surr)	91		59 - 120		05/28/19 15:39	1
Toluene-d8 (Surr)	117		70 - 123		05/28/19 15:39	1
Dibromofluoromethane (Surr)	137	X	75 - 128		05/28/19 15:39	1

Lab Sample ID: LCS 240-383285/4
Matrix: Water
Analysis Batch: 383285

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.44		ug/L		84	65 - 139
cis-1,2-Dichloroethene	10.0	9.78		ug/L		98	76 - 128
Tetrachloroethene	10.0	9.14		ug/L		91	74 - 130
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	78 - 133
Trichloroethene	10.0	8.41		ug/L		84	76 - 125

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-112949-1

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

Lab Sample ID: LCS 240-383285/4

Matrix: Water

Analysis Batch: 383285

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl chloride	10.0	8.94		ug/L		89	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	109		70 - 121
4-Bromofluorobenzene (Surr)	107		59 - 120
Toluene-d8 (Surr)	114		70 - 123
Dibromofluoromethane (Surr)	113		75 - 128

Lab Sample ID: 240-112863-A-10 MS

Matrix: Water

Analysis Batch: 383285

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	8.05		ug/L		80	53 - 140
cis-1,2-Dichloroethene	8.5		10.0	17.1		ug/L		86	64 - 130
Tetrachloroethene	1.0	U	10.0	8.81		ug/L		88	51 - 136
trans-1,2-Dichloroethene	1.0	U	10.0	10.5		ug/L		105	68 - 133
Trichloroethene	1.0	U	10.0	7.98		ug/L		80	55 - 131
Vinyl chloride	6.7		10.0	14.6		ug/L		79	43 - 154

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	113		70 - 121
4-Bromofluorobenzene (Surr)	107		59 - 120
Toluene-d8 (Surr)	116		70 - 123
Dibromofluoromethane (Surr)	110		75 - 128

Lab Sample ID: 240-112863-C-10 MSD

Matrix: Water

Analysis Batch: 383285

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
1,1-Dichloroethene	1.0	U	10.0	7.50		ug/L		75	53 - 140	7	35
cis-1,2-Dichloroethene	8.5		10.0	16.6		ug/L		81	64 - 130	3	21
Tetrachloroethene	1.0	U	10.0	8.79		ug/L		88	51 - 136	0	23
trans-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	68 - 133	6	24
Trichloroethene	1.0	U	10.0	7.79		ug/L		78	55 - 131	2	23
Vinyl chloride	6.7		10.0	13.9		ug/L		72	43 - 154	5	29

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	109		70 - 121
4-Bromofluorobenzene (Surr)	105		59 - 120
Toluene-d8 (Surr)	114		70 - 123
Dibromofluoromethane (Surr)	105		75 - 128

QC Sample Results

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

Job ID: 240-112949-1

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

Lab Sample ID: MB 240-383729/6
Matrix: Water
Analysis Batch: 383729

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			05/30/19 14:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/30/19 14:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/30/19 14:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/30/19 14:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/30/19 14:26	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/30/19 14:26	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	107		70 - 121		05/30/19 14:26	1
4-Bromofluorobenzene (Surr)	96		59 - 120		05/30/19 14:26	1
Toluene-d8 (Surr)	91		70 - 123		05/30/19 14:26	1
Dibromofluoromethane (Surr)	110		75 - 128		05/30/19 14:26	1

Lab Sample ID: LCS 240-383729/4
Matrix: Water
Analysis Batch: 383729

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	9.44		ug/L		94	65 - 139
cis-1,2-Dichloroethene	10.0	9.87		ug/L		99	76 - 128
Tetrachloroethene	10.0	10.7		ug/L		107	74 - 130
trans-1,2-Dichloroethene	10.0	10.7		ug/L		107	78 - 133
Trichloroethene	10.0	10.9		ug/L		109	76 - 125
Vinyl chloride	10.0	10.5		ug/L		105	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	106		70 - 121
4-Bromofluorobenzene (Surr)	93		59 - 120
Toluene-d8 (Surr)	93		70 - 123
Dibromofluoromethane (Surr)	113		75 - 128

Lab Sample ID: 240-112957-B-1 MS
Matrix: Water
Analysis Batch: 383729

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	9.27		ug/L		93	53 - 140
cis-1,2-Dichloroethene	1.0	U F2	10.0	9.09		ug/L		91	64 - 130
Tetrachloroethene	1.0	U F1 F2	10.0	9.89		ug/L		99	51 - 136
trans-1,2-Dichloroethene	1.0	U F2	10.0	9.09		ug/L		91	68 - 133
Trichloroethene	1.0	U F1 F2	10.0	10.2		ug/L		102	55 - 131
Vinyl chloride	2.2	F1 F2	10.0	12.5		ug/L		103	43 - 154

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	103		70 - 121
4-Bromofluorobenzene (Surr)	102		59 - 120
Toluene-d8 (Surr)	92		70 - 123

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-112949-1

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

Lab Sample ID: 240-112957-B-1 MS
Matrix: Water
Analysis Batch: 383729

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

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	100		75 - 128

Lab Sample ID: 240-112957-C-1 MSD
Matrix: Water
Analysis Batch: 383729

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
1,1-Dichloroethene	1.0	U	10.0	13.1		ug/L		131	53 - 140	34	35
cis-1,2-Dichloroethene	1.0	U F2	10.0	11.9	F2	ug/L		119	64 - 130	27	21
Tetrachloroethene	1.0	U F1 F2	10.0	15.7	F1 F2	ug/L		157	51 - 136	45	23
trans-1,2-Dichloroethene	1.0	U F2	10.0	12.9	F2	ug/L		129	68 - 133	34	24
Trichloroethene	1.0	U F1 F2	10.0	14.3	F1 F2	ug/L		143	55 - 131	34	23
Vinyl chloride	2.2	F1 F2	10.0	18.6	F1 F2	ug/L		164	43 - 154	39	29

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	107		70 - 121
4-Bromofluorobenzene (Surr)	105		59 - 120
Toluene-d8 (Surr)	95		70 - 123
Dibromofluoromethane (Surr)	119		75 - 128

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

Lab Sample ID: MB 240-382740/5
Matrix: Water
Analysis Batch: 382740

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			05/23/19 13:13	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	107		63 - 125		05/23/19 13:13	1

Lab Sample ID: LCS 240-382740/4
Matrix: Water
Analysis Batch: 382740

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	11.1		ug/L		111	59 - 131

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	108		63 - 125

Lab Sample ID: 240-112949-1 MS
Matrix: Water
Analysis Batch: 382740

Client Sample ID: MW-106S_051619
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	11.4		ug/L		114	52 - 129

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-112949-1

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

<i>Surrogate</i>	<i>MS %Recovery</i>	<i>MS Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	110		63 - 125

Lab Sample ID: 240-112949-1 MSD
 Matrix: Water
 Analysis Batch: 382740

Client Sample ID: MW-106S_051619
 Prep Type: Total/NA

<i>Analyte</i>	<i>Sample Result</i>	<i>Sample Qualifier</i>	<i>Spike Added</i>	<i>MSD Result</i>	<i>MSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec. Limits</i>	<i>RPD</i>	<i>RPD Limit</i>
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	52 - 129	5	13

<i>Surrogate</i>	<i>MSD %Recovery</i>	<i>MSD Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	108		63 - 125

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- 14

QC Association Summary

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

Job ID: 240-112949-1

GC/MS VOA

Analysis Batch: 382740

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-112949-1	MW-106S_051619	Total/NA	Water	8260B SIM	
240-112949-2	MW-138S_051619	Total/NA	Water	8260B SIM	
MB 240-382740/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-382740/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-112949-1 MS	MW-106S_051619	Total/NA	Water	8260B SIM	
240-112949-1 MSD	MW-106S_051619	Total/NA	Water	8260B SIM	

Analysis Batch: 383174

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-112949-1	MW-106S_051619	Total/NA	Water	8260B	
MB 240-383174/6	Method Blank	Total/NA	Water	8260B	
LCS 240-383174/4	Lab Control Sample	Total/NA	Water	8260B	
240-112949-1 MS	MW-106S_051619	Total/NA	Water	8260B	
240-112949-1 MSD	MW-106S_051619	Total/NA	Water	8260B	

Analysis Batch: 383285

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-112949-2	MW-138S_051619	Total/NA	Water	8260B	
240-112949-3	TRIP BLANK	Total/NA	Water	8260B	
MB 240-383285/6	Method Blank	Total/NA	Water	8260B	
LCS 240-383285/4	Lab Control Sample	Total/NA	Water	8260B	
240-112863-A-10 MS	Matrix Spike	Total/NA	Water	8260B	
240-112863-C-10 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 383729

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-112949-2	MW-138S_051619	Total/NA	Water	8260B	
MB 240-383729/6	Method Blank	Total/NA	Water	8260B	
LCS 240-383729/4	Lab Control Sample	Total/NA	Water	8260B	
240-112957-B-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-112957-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

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

Job ID: 240-112949-1

Client Sample ID: MW-106S_051619

Lab Sample ID: 240-112949-1

Date Collected: 05/16/19 16:20

Matrix: Water

Date Received: 05/20/19 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	383174	05/26/19 23:59	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	382740	05/23/19 15:17	SAM	TAL CAN

Client Sample ID: MW-138S_051619

Lab Sample ID: 240-112949-2

Date Collected: 05/16/19 12:10

Matrix: Water

Date Received: 05/20/19 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	383729	05/30/19 18:35	LRW	TAL CAN
Total/NA	Analysis	8260B		1	383285	05/28/19 22:34	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	382740	05/23/19 16:31	SAM	TAL CAN

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-112949-3

Date Collected: 05/16/19 00:00

Matrix: Water

Date Received: 05/20/19 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	383285	05/28/19 22:56	LRW	TAL CAN

Laboratory References:

TAL CAN = Eurofins 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

Job ID: 240-112949-1

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-20
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19 *
Illinois	NELAP	5	200004	07-31-19 *
Iowa	State Program	7	421	06-01-21
Kansas	NELAP	7	E-10336	04-30-20
Kentucky (UST)	State Program	4	58	02-23-20
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	03-31-20
Ohio VAP	State Program	5	CL0024	09-06-19 *
Oregon	NELAP	10	4062	02-23-20
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.



TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 112949

Client Arcadis Site Name _____
 Cooler Received on 5-18-19 Opened on 5-18-19
 FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Cooler unpacked by: _____

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

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____
 Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
 COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF -0.2 °C) Observed Cooler Temp. 0.8 °C Corrected Cooler Temp. 0.6 °C
 IR GUN #36 (CF +0.7°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
 -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
 -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
 If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC984738
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
16. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:

 VOAs
 Oil and Grease
 TOC

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

Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: _____

18. SAMPLE CONDITION

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

19. SAMPLE PRESERVATION

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

VOA Sample Preservation - Date/Time VOAs Frozen: _____