

ANALYTICAL REPORT

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Laboratory Job ID: 240-114392-1
Client Project/Site: Ford LTP Livonia MI - E203728

For:
ARCADIS U.S., Inc.
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Attn: Kristoffer Hinskey



Authorized for release by:
6/27/2019 11:04:31 AM

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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 - E203728

Job ID: 240-114392-1

Qualifiers

GC/MS VOA

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

Glossary

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

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

Job ID: 240-114392-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203728

Report Number: 240-114392-1

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 6/14/2019 8:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.0° C and 1.9° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-51_061219 (240-114392-1), MW-65_061219 (240-114392-2), MW-50_061219 (240-114392-3) and TRIP BLANK (240-114392-4) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 06/24/2019 and 06/25/2019.

Samples MW-65_061219 (240-114392-2)[1.67X] and MW-50_061219 (240-114392-3)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

VOLATILE ORGANIC COMPOUNDS (GCMS SIM)

Samples MW-51_061219 (240-114392-1), MW-65_061219 (240-114392-2) and MW-50_061219 (240-114392-3) were analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 06/17/2019.

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

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

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

Protocol References:

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

Laboratory References:

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



Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-114392-1	MW-51_061219	Water	06/12/19 10:23	06/14/19 08:15	
240-114392-2	MW-65_061219	Water	06/12/19 13:30	06/14/19 08:15	
240-114392-3	MW-50_061219	Water	06/12/19 15:52	06/14/19 08:15	
240-114392-4	TRIP BLANK	Water	06/12/19 00:00	06/14/19 08:15	

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

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

Client Sample ID: MW-51_061219

Lab Sample ID: 240-114392-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.2		2.0	0.86	ug/L	1		8260B SIM	Total/NA
cis-1,2-Dichloroethene	0.16	J	1.0	0.16	ug/L	1		8260B	Total/NA
Vinyl chloride	0.36	J	1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-65_061219

Lab Sample ID: 240-114392-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	3.8		2.0	0.86	ug/L	1		8260B SIM	Total/NA
cis-1,2-Dichloroethene	4.9		1.0	0.16	ug/L	1		8260B	Total/NA
Vinyl chloride	41		1.7	0.33	ug/L	1.67		8260B	Total/NA

Client Sample ID: MW-50_061219

Lab Sample ID: 240-114392-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	3.3		2.0	0.86	ug/L	1		8260B SIM	Total/NA
cis-1,2-Dichloroethene	9.4		1.0	0.16	ug/L	1		8260B	Total/NA
trans-1,2-Dichloroethene	0.31	J	1.0	0.19	ug/L	1		8260B	Total/NA
Vinyl chloride	200		10	2.0	ug/L	10		8260B	Total/NA

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-114392-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.52	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 - E203728

Job ID: 240-114392-1

Client Sample ID: MW-51_061219

Lab Sample ID: 240-114392-1

Date Collected: 06/12/19 10:23

Matrix: Water

Date Received: 06/14/19 08:15

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.2		2.0	0.86	ug/L			06/17/19 20:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		63 - 125		06/17/19 20:05	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			06/24/19 22:37	1
cis-1,2-Dichloroethene	0.16	J	1.0	0.16	ug/L			06/24/19 22:37	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/24/19 22:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/24/19 22:37	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/24/19 22:37	1
Vinyl chloride	0.36	J	1.0	0.20	ug/L			06/24/19 22:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	108		70 - 121		06/24/19 22:37	1
4-Bromofluorobenzene (Surr)	74		59 - 120		06/24/19 22:37	1
Toluene-d8 (Surr)	86		70 - 123		06/24/19 22:37	1
Dibromofluoromethane (Surr)	111		75 - 128		06/24/19 22:37	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

Client Sample ID: MW-65_061219

Lab Sample ID: 240-114392-2

Date Collected: 06/12/19 13:30

Matrix: Water

Date Received: 06/14/19 08:15

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	3.8		2.0	0.86	ug/L			06/17/19 20:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		63 - 125		06/17/19 20:30	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/24/19 23:01	1
cis-1,2-Dichloroethene	4.9		1.0	0.16	ug/L			06/24/19 23:01	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/24/19 23:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/24/19 23:01	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/24/19 23:01	1
Vinyl chloride	41		1.7	0.33	ug/L			06/25/19 14:40	1.67

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		70 - 121		06/24/19 23:01	1
1,2-Dichloroethane-d4 (Surr)	106		70 - 121		06/25/19 14:40	1.67
4-Bromofluorobenzene (Surr)	72		59 - 120		06/24/19 23:01	1
4-Bromofluorobenzene (Surr)	73		59 - 120		06/25/19 14:40	1.67
Toluene-d8 (Surr)	86		70 - 123		06/24/19 23:01	1
Toluene-d8 (Surr)	83		70 - 123		06/25/19 14:40	1.67
Dibromofluoromethane (Surr)	109		75 - 128		06/24/19 23:01	1
Dibromofluoromethane (Surr)	106		75 - 128		06/25/19 14:40	1.67

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

Client Sample ID: MW-50_061219

Lab Sample ID: 240-114392-3

Date Collected: 06/12/19 15:52

Matrix: Water

Date Received: 06/14/19 08:15

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	3.3		2.0	0.86	ug/L			06/17/19 20:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		63 - 125		06/17/19 20:55	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/24/19 23:25	1
cis-1,2-Dichloroethene	9.4		1.0	0.16	ug/L			06/24/19 23:25	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/24/19 23:25	1
trans-1,2-Dichloroethene	0.31	J	1.0	0.19	ug/L			06/24/19 23:25	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/24/19 23:25	1
Vinyl chloride	200		10	2.0	ug/L			06/25/19 15:04	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	108		70 - 121		06/24/19 23:25	1
1,2-Dichloroethane-d4 (Surr)	111		70 - 121		06/25/19 15:04	10
4-Bromofluorobenzene (Surr)	71		59 - 120		06/24/19 23:25	1
4-Bromofluorobenzene (Surr)	74		59 - 120		06/25/19 15:04	10
Toluene-d8 (Surr)	84		70 - 123		06/24/19 23:25	1
Toluene-d8 (Surr)	84		70 - 123		06/25/19 15:04	10
Dibromofluoromethane (Surr)	108		75 - 128		06/24/19 23:25	1
Dibromofluoromethane (Surr)	111		75 - 128		06/25/19 15:04	10

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-114392-4

Date Collected: 06/12/19 00:00

Matrix: Water

Date Received: 06/14/19 08:15

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			06/24/19 23:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			06/24/19 23:49	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/24/19 23:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/24/19 23:49	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/24/19 23:49	1
Vinyl chloride	0.52	J	1.0	0.20	ug/L			06/24/19 23:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		70 - 121		06/24/19 23:49	1
4-Bromofluorobenzene (Surr)	73		59 - 120		06/24/19 23:49	1
Toluene-d8 (Surr)	85		70 - 123		06/24/19 23:49	1
Dibromofluoromethane (Surr)	113		75 - 128		06/24/19 23:49	1

Surrogate Summary

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

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)
190-20042-C-2 MS	Matrix Spike	91	100	96	94
190-20042-E-2 MSD	Matrix Spike Duplicate	87	97	94	91
240-114392-1	MW-51_061219	108	74	86	111
240-114392-2	MW-65_061219	106	72	86	109
240-114392-2	MW-65_061219	106	73	83	106
240-114392-3	MW-50_061219	108	71	84	108
240-114392-3	MW-50_061219	111	74	84	111
240-114392-4	TRIP BLANK	109	73	85	113
LCS 240-387877/4	Lab Control Sample	87	103	96	92
LCS 240-388085/4	Lab Control Sample	86	99	96	93
MB 240-387877/7	Method Blank	106	74	85	107
MB 240-388085/7	Method Blank	104	77	88	105

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)
240-114331-F-4 MS	Matrix Spike	90
240-114331-F-4 MSD	Matrix Spike Duplicate	88
240-114392-1	MW-51_061219	88
240-114392-2	MW-65_061219	87
240-114392-3	MW-50_061219	83
LCS 240-386516/4	Lab Control Sample	86
MB 240-386516/5	Method Blank	86

Surrogate Legend

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

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

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

Lab Sample ID: MB 240-387877/7

Matrix: Water

Analysis Batch: 387877

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			06/24/19 15:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			06/24/19 15:04	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/24/19 15:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/24/19 15:04	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/24/19 15:04	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			06/24/19 15:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		70 - 121		06/24/19 15:04	1
4-Bromofluorobenzene (Surr)	74		59 - 120		06/24/19 15:04	1
Toluene-d8 (Surr)	85		70 - 123		06/24/19 15:04	1
Dibromofluoromethane (Surr)	107		75 - 128		06/24/19 15:04	1

Lab Sample ID: LCS 240-387877/4

Matrix: Water

Analysis Batch: 387877

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	9.92		ug/L		99	65 - 139
cis-1,2-Dichloroethene	10.0	9.63		ug/L		96	76 - 128
Tetrachloroethene	10.0	9.86		ug/L		99	74 - 130
trans-1,2-Dichloroethene	10.0	10.5		ug/L		105	78 - 133
Trichloroethene	10.0	9.62		ug/L		96	76 - 125
Vinyl chloride	10.0	10.2		ug/L		102	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	87		70 - 121
4-Bromofluorobenzene (Surr)	103		59 - 120
Toluene-d8 (Surr)	96		70 - 123
Dibromofluoromethane (Surr)	92		75 - 128

Lab Sample ID: MB 240-388085/7

Matrix: Water

Analysis Batch: 388085

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			06/25/19 14:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			06/25/19 14:16	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/25/19 14:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/25/19 14:16	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/25/19 14:16	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			06/25/19 14:16	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		70 - 121		06/25/19 14:16	1
4-Bromofluorobenzene (Surr)	77		59 - 120		06/25/19 14:16	1
Toluene-d8 (Surr)	88		70 - 123		06/25/19 14:16	1

Eurofins TestAmerica, Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

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

Lab Sample ID: MB 240-388085/7
Matrix: Water
Analysis Batch: 388085

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

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Dibromofluoromethane (Surr)</i>	105		75 - 128		06/25/19 14:16	1

Lab Sample ID: LCS 240-388085/4
Matrix: Water
Analysis Batch: 388085

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

<i>Analyte</i>	<i>Spike Added</i>	<i>LCS Result</i>	<i>LCS Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec. Limits</i>
1,1-Dichloroethene	10.0	9.66		ug/L		97	65 - 139
cis-1,2-Dichloroethene	10.0	9.58		ug/L		96	76 - 128
Tetrachloroethene	10.0	10.3		ug/L		103	74 - 130
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	78 - 133
Trichloroethene	10.0	9.30		ug/L		93	76 - 125
Vinyl chloride	10.0	9.81		ug/L		98	58 - 143

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>1,2-Dichloroethane-d4 (Surr)</i>	86		70 - 121
<i>4-Bromofluorobenzene (Surr)</i>	99		59 - 120
<i>Toluene-d8 (Surr)</i>	96		70 - 123
<i>Dibromofluoromethane (Surr)</i>	93		75 - 128

Lab Sample ID: 190-20042-C-2 MS
Matrix: Water
Analysis Batch: 388085

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

<i>Analyte</i>	<i>Sample Result</i>	<i>Sample Qualifier</i>	<i>Spike Added</i>	<i>MS Result</i>	<i>MS Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec. Limits</i>
1,1-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	53 - 140
cis-1,2-Dichloroethene	0.53	J	10.0	9.67		ug/L		91	64 - 130
Tetrachloroethene	1.0	U	10.0	10.3		ug/L		103	51 - 136
trans-1,2-Dichloroethene	1.0	U	10.0	9.94		ug/L		99	68 - 133
Trichloroethene	1.0	U	10.0	9.21		ug/L		92	55 - 131
Vinyl chloride	2.0		10.0	11.7		ug/L		97	43 - 154

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>1,2-Dichloroethane-d4 (Surr)</i>	91		70 - 121
<i>4-Bromofluorobenzene (Surr)</i>	100		59 - 120
<i>Toluene-d8 (Surr)</i>	96		70 - 123
<i>Dibromofluoromethane (Surr)</i>	94		75 - 128

Lab Sample ID: 190-20042-E-2 MSD
Matrix: Water
Analysis Batch: 388085

Client Sample ID: Matrix Spike Duplicate
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>
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	53 - 140	4	35
cis-1,2-Dichloroethene	0.53	J	10.0	10.2		ug/L		97	64 - 130	5	21
Tetrachloroethene	1.0	U	10.0	9.91		ug/L		99	51 - 136	4	23
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	68 - 133	5	24
Trichloroethene	1.0	U	10.0	9.52		ug/L		95	55 - 131	3	23

Eurofins TestAmerica, Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

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

Lab Sample ID: 190-20042-E-2 MSD
Matrix: Water
Analysis Batch: 388085

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
Vinyl chloride	2.0		10.0	12.2		ug/L		103	43 - 154	5	29
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	87		70 - 121								
4-Bromofluorobenzene (Surr)	97		59 - 120								
Toluene-d8 (Surr)	94		70 - 123								
Dibromofluoromethane (Surr)	91		75 - 128								

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

Lab Sample ID: MB 240-386516/5
Matrix: Water
Analysis Batch: 386516

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			06/17/19 11:17	1
Surrogate	MB %Recovery	MB Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	86		63 - 125						
							Prepared	Analyzed	Dil Fac
								06/17/19 11:17	1

Lab Sample ID: LCS 240-386516/4
Matrix: Water
Analysis Batch: 386516

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	12.3		ug/L		123	59 - 131
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	86		63 - 125				

Lab Sample ID: 240-114331-F-4 MS
Matrix: Water
Analysis Batch: 386516

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	0.94	J	10.0	12.2		ug/L		113	52 - 129
Surrogate	MS %Recovery	MS Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	90		63 - 125						

Lab Sample ID: 240-114331-F-4 MSD
Matrix: Water
Analysis Batch: 386516

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	0.94	J	10.0	12.3		ug/L		113	52 - 129	1	13

Eurofins TestAmerica, Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

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

Lab Sample ID: 240-114331-F-4 MSD
Matrix: Water
Analysis Batch: 386516

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

<i>Surrogate</i>	<i>MSD</i> <i>%Recovery</i>	<i>MSD</i> <i>Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	88		63 - 125

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QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

GC/MS VOA

Analysis Batch: 386516

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-114392-1	MW-51_061219	Total/NA	Water	8260B SIM	
240-114392-2	MW-65_061219	Total/NA	Water	8260B SIM	
240-114392-3	MW-50_061219	Total/NA	Water	8260B SIM	
MB 240-386516/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-386516/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-114331-F-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-114331-F-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 387877

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-114392-1	MW-51_061219	Total/NA	Water	8260B	
240-114392-2	MW-65_061219	Total/NA	Water	8260B	
240-114392-3	MW-50_061219	Total/NA	Water	8260B	
240-114392-4	TRIP BLANK	Total/NA	Water	8260B	
MB 240-387877/7	Method Blank	Total/NA	Water	8260B	
LCS 240-387877/4	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 388085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-114392-2	MW-65_061219	Total/NA	Water	8260B	
240-114392-3	MW-50_061219	Total/NA	Water	8260B	
MB 240-388085/7	Method Blank	Total/NA	Water	8260B	
LCS 240-388085/4	Lab Control Sample	Total/NA	Water	8260B	
190-20042-C-2 MS	Matrix Spike	Total/NA	Water	8260B	
190-20042-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 240-114392-1

Client Sample ID: MW-51_061219

Lab Sample ID: 240-114392-1

Date Collected: 06/12/19 10:23

Matrix: Water

Date Received: 06/14/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	387877	06/24/19 22:37	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	386516	06/17/19 20:05	SAM	TAL CAN

Client Sample ID: MW-65_061219

Lab Sample ID: 240-114392-2

Date Collected: 06/12/19 13:30

Matrix: Water

Date Received: 06/14/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	387877	06/24/19 23:01	LRW	TAL CAN
Total/NA	Analysis	8260B		1.67	388085	06/25/19 14:40	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	386516	06/17/19 20:30	SAM	TAL CAN

Client Sample ID: MW-50_061219

Lab Sample ID: 240-114392-3

Date Collected: 06/12/19 15:52

Matrix: Water

Date Received: 06/14/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	387877	06/24/19 23:25	LRW	TAL CAN
Total/NA	Analysis	8260B		10	388085	06/25/19 15:04	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	386516	06/17/19 20:55	SAM	TAL CAN

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-114392-4

Date Collected: 06/12/19 00:00

Matrix: Water

Date Received: 06/14/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	387877	06/24/19 23:49	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 - E203728

Job ID: 240-114392-1

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		2927	02-23-20
California	State Program	9	2927	02-23-20
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19 *
Florida	NELAP		E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19 *
Illinois	NELAP		004498	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	06-30-20
New Jersey	NELAP		OH001	06-30-19
New York	NELAP	2	10975	03-31-20
New York	NELAP		10975	03-31-20
Ohio VAP	State Program	5	CL0024	06-05-21
Oregon	NELAP	10	4062	02-23-20
Oregon	NELAP		4062	02-23-20
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Pennsylvania	NELAP		68-00340	08-31-19
Texas	NELAP	6	T104704517-18-10	08-31-19 *
Texas	NELAP		T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19 *
Virginia	NELAP		010101	09-14-19
Washington	State		C971	01-12-20
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.

Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 114392

Canton Facility

Client Areadis Site Name _____ Cooler unpacked by: [Signature]

Cooler Received on 6-14-19 Opened on 6-19-19

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

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

- Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF +0.1 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. 1 °C
 IR GUN #36 (CF +0.6 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
- Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 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
- Shippers' packing slip attached to the cooler(s)? Yes No
- Did custody papers accompany the sample(s)? Yes No
- Were the custody papers relinquished & signed in the appropriate place? Yes No
- Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
- Did all bottles arrive in good condition (Unbroken)? Yes No
- Could all bottle labels be reconciled with the COC? Yes No
- Were correct bottle(s) used for the test(s) indicated? Yes No
- Sufficient quantity received to perform indicated analyses? Yes No
- Are these work share samples? Yes No
 If yes, Questions 12-16 have been checked at the originating laboratory.
- Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC984738
- Were VOAs on the COC? Yes No
- Were air bubbles >6 mm in any VOA vials? Yes No NA ● ← Larger than this.
- Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # B831701VB Yes No
- Was a LL Hg or Me Hg trip blank present? Yes No

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

Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by: [Signature]

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: _____

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