

ANALYTICAL REPORT

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Laboratory Job ID: 240-114523-1
Client Project/Site: Ford LTP Livonia MI - E203728

For:
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Authorized for release by:
6/30/2019 1:05:20 PM

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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: 240-114523-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F2	MS/MSD RPD exceeds control limits
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: 240-114523-1

Job ID: 240-114523-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203728

Report Number: 240-114523-1

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 6/18/2019 8:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 3.1° C, 3.7° C and 3.9° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-40_061519 (240-114523-1), MW-31_061519 (240-114523-2), MW-30_061519 (240-114523-3), MW-120_061519 (240-114523-4) and TRIP BLANK (240-114523-5) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 06/25/2019.

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-40_061519 (240-114523-1), MW-31_061519 (240-114523-2), MW-30_061519 (240-114523-3) and MW-120_061519 (240-114523-4) were analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 06/20/2019 and 06/21/2019.

1,4-Dioxane exceeded the RPD limit for the MSD of sample MW-40_061519MSD (240-114523-1) in batch 240-387533. Refer to the QC report for details.

No additional 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: 240-114523-1

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: 240-114523-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-114523-1	MW-40_061519	Water	06/15/19 10:10	06/18/19 08:40	
240-114523-2	MW-31_061519	Water	06/15/19 11:30	06/18/19 08:40	
240-114523-3	MW-30_061519	Water	06/15/19 13:30	06/18/19 08:40	
240-114523-4	MW-120_061519	Water	06/15/19 15:30	06/18/19 08:40	
240-114523-5	TRIP BLANK	Water	06/15/19 00:00	06/18/19 08:40	

- 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: 240-114523-1

Client Sample ID: MW-40_061519

Lab Sample ID: 240-114523-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	2.2		1.0	0.16	ug/L	1		8260B	Total/NA
trans-1,2-Dichloroethene	0.37	J	1.0	0.19	ug/L	1		8260B	Total/NA
Vinyl chloride	0.26	J	1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-31_061519

Lab Sample ID: 240-114523-2

No Detections.

Client Sample ID: MW-30_061519

Lab Sample ID: 240-114523-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	13		2.0	0.86	ug/L	1		8260B SIM	Total/NA

Client Sample ID: MW-120_061519

Lab Sample ID: 240-114523-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	4.3		1.0	0.10	ug/L	1		8260B	Total/NA

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-114523-5

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 - E203728

Job ID: 240-114523-1

Client Sample ID: MW-40_061519

Lab Sample ID: 240-114523-1

Date Collected: 06/15/19 10:10

Matrix: Water

Date Received: 06/18/19 08:40

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 F2	2.0	0.86	ug/L			06/21/19 18:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		63 - 125					06/21/19 18:01	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			06/25/19 18:04	1
cis-1,2-Dichloroethene	2.2		1.0	0.16	ug/L			06/25/19 18:04	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/25/19 18:04	1
trans-1,2-Dichloroethene	0.37	J	1.0	0.19	ug/L			06/25/19 18:04	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/25/19 18:04	1
Vinyl chloride	0.26	J	1.0	0.20	ug/L			06/25/19 18:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	118		70 - 121					06/25/19 18:04	1
4-Bromofluorobenzene (Surr)	94		59 - 120					06/25/19 18:04	1
Toluene-d8 (Surr)	100		70 - 123					06/25/19 18:04	1
Dibromofluoromethane (Surr)	103		75 - 128					06/25/19 18:04	1

Client Sample Results

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

Job ID: 240-114523-1

Client Sample ID: MW-31_061519

Lab Sample ID: 240-114523-2

Date Collected: 06/15/19 11:30

Matrix: Water

Date Received: 06/18/19 08:40

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			06/21/19 19:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	112		63 - 125		06/21/19 19:15	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			06/25/19 02:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			06/25/19 02:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/25/19 02:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/25/19 02:56	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/25/19 02:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			06/25/19 02:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	119		70 - 121		06/25/19 02:56	1
4-Bromofluorobenzene (Surr)	102		59 - 120		06/25/19 02:56	1
Toluene-d8 (Surr)	87		70 - 123		06/25/19 02:56	1
Dibromofluoromethane (Surr)	118		75 - 128		06/25/19 02:56	1

Client Sample Results

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

Job ID: 240-114523-1

Client Sample ID: MW-30_061519

Lab Sample ID: 240-114523-3

Date Collected: 06/15/19 13:30

Matrix: Water

Date Received: 06/18/19 08:40

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	13		2.0	0.86	ug/L			06/20/19 21:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		63 - 125		06/20/19 21:47	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			06/25/19 03:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			06/25/19 03:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/25/19 03:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/25/19 03:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/25/19 03:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			06/25/19 03:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		70 - 121		06/25/19 03:22	1
4-Bromofluorobenzene (Surr)	96		59 - 120		06/25/19 03:22	1
Toluene-d8 (Surr)	83		70 - 123		06/25/19 03:22	1
Dibromofluoromethane (Surr)	100		75 - 128		06/25/19 03:22	1

Client Sample Results

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

Job ID: 240-114523-1

Client Sample ID: MW-120_061519

Lab Sample ID: 240-114523-4

Date Collected: 06/15/19 15:30

Matrix: Water

Date Received: 06/18/19 08:40

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			06/20/19 22:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	115		63 - 125		06/20/19 22:12	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			06/25/19 17:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			06/25/19 17:12	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/25/19 17:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/25/19 17:12	1
Trichloroethene	4.3		1.0	0.10	ug/L			06/25/19 17:12	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			06/25/19 17:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	114		70 - 121		06/25/19 17:12	1
4-Bromofluorobenzene (Surr)	85		59 - 120		06/25/19 17:12	1
Toluene-d8 (Surr)	80		70 - 123		06/25/19 17:12	1
Dibromofluoromethane (Surr)	115		75 - 128		06/25/19 17:12	1

Client Sample Results

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

Job ID: 240-114523-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-114523-5

Date Collected: 06/15/19 00:00

Matrix: Water

Date Received: 06/18/19 08:40

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			06/25/19 17:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			06/25/19 17:37	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/25/19 17:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/25/19 17:37	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/25/19 17:37	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			06/25/19 17:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	118		70 - 121		06/25/19 17:37	1
4-Bromofluorobenzene (Surr)	106		59 - 120		06/25/19 17:37	1
Toluene-d8 (Surr)	88		70 - 123		06/25/19 17:37	1
Dibromofluoromethane (Surr)	109		75 - 128		06/25/19 17:37	1

Surrogate Summary

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

Job ID: 240-114523-1

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)
240-114521-K-3 MS	Matrix Spike	111	92	97	109
240-114521-L-3 MSD	Matrix Spike Duplicate	113	104	90	113
240-114523-1	MW-40_061519	118	94	100	103
240-114523-1 MS	MW-40_061519	114	94	75	114
240-114523-1 MSD	MW-40_061519	109	90	82	116
240-114523-2	MW-31_061519	119	102	87	118
240-114523-3	MW-30_061519	113	96	83	100
240-114523-4	MW-120_061519	114	85	80	115
240-114523-5	TRIP BLANK	118	106	88	109
LCS 240-387956/4	Lab Control Sample	106	92	87	106
LCS 240-388086/4	Lab Control Sample	102	87	79	102
MB 240-387956/7	Method Blank	110	85	88	115
MB 240-388086/7	Method Blank	121	88	80	109

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)
240-114521-C-3 MS	Matrix Spike	113
240-114521-C-3 MSD	Matrix Spike Duplicate	109
240-114523-1	MW-40_061519	109
240-114523-1 MS	MW-40_061519	115
240-114523-1 MSD	MW-40_061519	112
240-114523-2	MW-31_061519	112
240-114523-3	MW-30_061519	113
240-114523-4	MW-120_061519	115
LCS 240-387287/4	Lab Control Sample	108
LCS 240-387533/4	Lab Control Sample	111
MB 240-387287/5	Method Blank	106
MB 240-387533/5	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 - E203728

Job ID: 240-114523-1

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

Lab Sample ID: MB 240-387956/7
Matrix: Water
Analysis Batch: 387956

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 18:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			06/24/19 18:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/24/19 18:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/24/19 18:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/24/19 18:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			06/24/19 18:14	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	110		70 - 121		06/24/19 18:14	1
4-Bromofluorobenzene (Surr)	85		59 - 120		06/24/19 18:14	1
Toluene-d8 (Surr)	88		70 - 123		06/24/19 18:14	1
Dibromofluoromethane (Surr)	115		75 - 128		06/24/19 18:14	1

Lab Sample ID: LCS 240-387956/4
Matrix: Water
Analysis Batch: 387956

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	11.0		ug/L		110	65 - 139
cis-1,2-Dichloroethene	10.0	9.86		ug/L		99	76 - 128
Tetrachloroethene	10.0	11.9		ug/L		119	74 - 130
trans-1,2-Dichloroethene	10.0	9.51		ug/L		95	78 - 133
Trichloroethene	10.0	12.2		ug/L		122	76 - 125
Vinyl chloride	10.0	9.63		ug/L		96	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	106		70 - 121
4-Bromofluorobenzene (Surr)	92		59 - 120
Toluene-d8 (Surr)	87		70 - 123
Dibromofluoromethane (Surr)	106		75 - 128

Lab Sample ID: 240-114521-K-3 MS
Matrix: Water
Analysis Batch: 387956

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	8.58		ug/L		86	53 - 140
cis-1,2-Dichloroethene	1.0	U	10.0	8.32		ug/L		83	64 - 130
Tetrachloroethene	1.0	U	10.0	10.5		ug/L		105	51 - 136
trans-1,2-Dichloroethene	1.0	U	10.0	8.48		ug/L		85	68 - 133
Trichloroethene	1.0	U F2	10.0	8.82		ug/L		88	55 - 131
Vinyl chloride	0.67	J	10.0	9.69		ug/L		90	43 - 154

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	111		70 - 121
4-Bromofluorobenzene (Surr)	92		59 - 120
Toluene-d8 (Surr)	97		70 - 123

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-114523-1

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

Lab Sample ID: 240-114521-K-3 MS
Matrix: Water
Analysis Batch: 387956

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

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	109		75 - 128

Lab Sample ID: 240-114521-L-3 MSD
Matrix: Water
Analysis Batch: 387956

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	9.34		ug/L		93	53 - 140	8	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.01		ug/L		90	64 - 130	8	21
Tetrachloroethene	1.0	U	10.0	9.55		ug/L		96	51 - 136	9	23
trans-1,2-Dichloroethene	1.0	U	10.0	8.87		ug/L		89	68 - 133	4	24
Trichloroethene	1.0	U F2	10.0	11.4	F2	ug/L		114	55 - 131	26	23
Vinyl chloride	0.67	J	10.0	9.27		ug/L		86	43 - 154	4	29

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	113		70 - 121
4-Bromofluorobenzene (Surr)	104		59 - 120
Toluene-d8 (Surr)	90		70 - 123
Dibromofluoromethane (Surr)	113		75 - 128

Lab Sample ID: MB 240-388086/7
Matrix: Water
Analysis Batch: 388086

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 15:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			06/25/19 15:05	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			06/25/19 15:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			06/25/19 15:05	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			06/25/19 15:05	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			06/25/19 15:05	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	121		70 - 121		06/25/19 15:05	1
4-Bromofluorobenzene (Surr)	88		59 - 120		06/25/19 15:05	1
Toluene-d8 (Surr)	80		70 - 123		06/25/19 15:05	1
Dibromofluoromethane (Surr)	109		75 - 128		06/25/19 15:05	1

Lab Sample ID: LCS 240-388086/4
Matrix: Water
Analysis Batch: 388086

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	8.13		ug/L		81	65 - 139
cis-1,2-Dichloroethene	10.0	8.29		ug/L		83	76 - 128
Tetrachloroethene	10.0	11.8		ug/L		118	74 - 130
trans-1,2-Dichloroethene	10.0	9.04		ug/L		90	78 - 133
Trichloroethene	10.0	10.6		ug/L		106	76 - 125

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-114523-1

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

Lab Sample ID: LCS 240-388086/4
Matrix: Water
Analysis Batch: 388086

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	8.38		ug/L		84	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	102		70 - 121
4-Bromofluorobenzene (Surr)	87		59 - 120
Toluene-d8 (Surr)	79		70 - 123
Dibromofluoromethane (Surr)	102		75 - 128

Lab Sample ID: 240-114523-1 MS
Matrix: Water
Analysis Batch: 388086

Client Sample ID: MW-40_061519
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	11.0		ug/L		110	53 - 140
cis-1,2-Dichloroethene	2.2		10.0	13.2		ug/L		110	64 - 130
Tetrachloroethene	1.0	U	10.0	10.6		ug/L		106	51 - 136
trans-1,2-Dichloroethene	0.37	J	10.0	10.2		ug/L		99	68 - 133
Trichloroethene	1.0	U	10.0	11.6		ug/L		116	55 - 131
Vinyl chloride	0.26	J	10.0	9.96		ug/L		97	43 - 154

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	114		70 - 121
4-Bromofluorobenzene (Surr)	94		59 - 120
Toluene-d8 (Surr)	75		70 - 123
Dibromofluoromethane (Surr)	114		75 - 128

Lab Sample ID: 240-114523-1 MSD
Matrix: Water
Analysis Batch: 388086

Client Sample ID: MW-40_061519
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	8.01		ug/L		80	53 - 140	32	35
cis-1,2-Dichloroethene	2.2		10.0	11.2		ug/L		90	64 - 130	16	21
Tetrachloroethene	1.0	U	10.0	10.2		ug/L		102	51 - 136	4	23
trans-1,2-Dichloroethene	0.37	J	10.0	8.81		ug/L		84	68 - 133	15	24
Trichloroethene	1.0	U	10.0	10.7		ug/L		107	55 - 131	8	23
Vinyl chloride	0.26	J	10.0	8.97		ug/L		87	43 - 154	11	29

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	109		70 - 121
4-Bromofluorobenzene (Surr)	90		59 - 120
Toluene-d8 (Surr)	82		70 - 123
Dibromofluoromethane (Surr)	116		75 - 128

QC Sample Results

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

Job ID: 240-114523-1

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

Lab Sample ID: MB 240-387287/5
Matrix: Water
Analysis Batch: 387287

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	-		06/20/19 12:10	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		63 - 125					06/20/19 12:10	1

Lab Sample ID: LCS 240-387287/4
Matrix: Water
Analysis Batch: 387287

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	9.56		ug/L	-	96	59 - 131
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	108		63 - 125				

Lab Sample ID: 240-114521-C-3 MS
Matrix: Water
Analysis Batch: 387287

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	2.5		10.0	13.9		ug/L	-	114	52 - 129
Surrogate	MS %Recovery	MS Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	113		63 - 125						

Lab Sample ID: 240-114521-C-3 MSD
Matrix: Water
Analysis Batch: 387287

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	2.5		10.0	12.9		ug/L	-	104	52 - 129	8	13
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	109		63 - 125								

Lab Sample ID: MB 240-387533/5
Matrix: Water
Analysis Batch: 387533

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	-		06/21/19 13:15	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	107		63 - 125					06/21/19 13:15	1

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-114523-1

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

Lab Sample ID: LCS 240-387533/4
Matrix: Water
Analysis Batch: 387533

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	10.2		ug/L		102	59 - 131
Surrogate	%Recovery	LCS Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	111		63 - 125				

Lab Sample ID: 240-114523-1 MS
Matrix: Water
Analysis Batch: 387533

Client Sample ID: MW-40_061519
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 F2	10.0	11.8		ug/L		118	52 - 129
Surrogate	%Recovery	MS Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	115		63 - 125						

Lab Sample ID: 240-114523-1 MSD
Matrix: Water
Analysis Batch: 387533

Client Sample ID: MW-40_061519
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 F2	10.0	10.2	F2	ug/L		102	52 - 129	15	13
Surrogate	%Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	112		63 - 125								

QC Association Summary

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

Job ID: 240-114523-1

GC/MS VOA

Analysis Batch: 387287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-114523-3	MW-30_061519	Total/NA	Water	8260B SIM	
240-114523-4	MW-120_061519	Total/NA	Water	8260B SIM	
MB 240-387287/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-387287/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-114521-C-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-114521-C-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 387533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-114523-1	MW-40_061519	Total/NA	Water	8260B SIM	
240-114523-2	MW-31_061519	Total/NA	Water	8260B SIM	
MB 240-387533/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-387533/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-114523-1 MS	MW-40_061519	Total/NA	Water	8260B SIM	
240-114523-1 MSD	MW-40_061519	Total/NA	Water	8260B SIM	

Analysis Batch: 387956

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-114523-2	MW-31_061519	Total/NA	Water	8260B	
240-114523-3	MW-30_061519	Total/NA	Water	8260B	
MB 240-387956/7	Method Blank	Total/NA	Water	8260B	
LCS 240-387956/4	Lab Control Sample	Total/NA	Water	8260B	
240-114521-K-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-114521-L-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 388086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-114523-1	MW-40_061519	Total/NA	Water	8260B	
240-114523-4	MW-120_061519	Total/NA	Water	8260B	
240-114523-5	TRIP BLANK	Total/NA	Water	8260B	
MB 240-388086/7	Method Blank	Total/NA	Water	8260B	
LCS 240-388086/4	Lab Control Sample	Total/NA	Water	8260B	
240-114523-1 MS	MW-40_061519	Total/NA	Water	8260B	
240-114523-1 MSD	MW-40_061519	Total/NA	Water	8260B	

Lab Chronicle

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

Job ID: 240-114523-1

Client Sample ID: MW-40_061519

Lab Sample ID: 240-114523-1

Date Collected: 06/15/19 10:10

Matrix: Water

Date Received: 06/18/19 08:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	388086	06/25/19 18:04	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	387533	06/21/19 18:01	SAM	TAL CAN

Client Sample ID: MW-31_061519

Lab Sample ID: 240-114523-2

Date Collected: 06/15/19 11:30

Matrix: Water

Date Received: 06/18/19 08:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	387956	06/25/19 02:56	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	387533	06/21/19 19:15	SAM	TAL CAN

Client Sample ID: MW-30_061519

Lab Sample ID: 240-114523-3

Date Collected: 06/15/19 13:30

Matrix: Water

Date Received: 06/18/19 08:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	387956	06/25/19 03:22	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	387287	06/20/19 21:47	SAM	TAL CAN

Client Sample ID: MW-120_061519

Lab Sample ID: 240-114523-4

Date Collected: 06/15/19 15:30

Matrix: Water

Date Received: 06/18/19 08:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	388086	06/25/19 17:12	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	387287	06/20/19 22:12	SAM	TAL CAN

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-114523-5

Date Collected: 06/15/19 00:00

Matrix: Water

Date Received: 06/18/19 08:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	388086	06/25/19 17:37	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: 240-114523-1

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	06-30-20
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
Canton Facility

Login # : 114523

Client Arcadis Site Name _____ Cooler unpacked by: [Signature]
 Cooler Received on 6-18-19 Opened on 6-18-19
 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 _____

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF +0.1 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN #36 (CF +0.6 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3 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
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 # B 831701 V3 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: [Signature] / M.S.

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: _____

