

ANALYTICAL REPORT

Eurofins TestAmerica, Canton
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Laboratory Job ID: 240-119764-1
Client Project/Site: Ford LTP Livonia MI - E203728

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



Authorized for release by:
10/15/2019 2:58:53 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: 240-119764-1

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: 240-119764-1

Job ID: 240-119764-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203728

Report Number: 240-119764-1

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 10/1/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.3° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-70_092619 (240-119764-1), DUP-11 (240-119764-2) and TRIP BLANK (240-119764-3) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 10/09/2019.

Samples MW-70_092619 (240-119764-1)[5X] and DUP-11 (240-119764-2)[5X] 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-70_092619 (240-119764-1) and DUP-11 (240-119764-2) were analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 10/04/2019.

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: 240-119764-1

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: 240-119764-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-119764-1	MW-70_092619	Water	09/26/19 16:09	10/01/19 09:30	
240-119764-2	DUP-11	Water	09/26/19 00:00	10/01/19 09:30	
240-119764-3	TRIP BLANK	Water	09/26/19 00:00	10/01/19 09:30	

- 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: 240-119764-1

Client Sample ID: MW-70_092619

Lab Sample ID: 240-119764-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	4.2		2.0	0.86	ug/L	1		8260B SIM	Total/NA
cis-1,2-Dichloroethene	220		5.0	0.80	ug/L	5		8260B	Total/NA
trans-1,2-Dichloroethene	2.1	J	5.0	0.95	ug/L	5		8260B	Total/NA
Vinyl chloride	340		5.0	1.0	ug/L	5		8260B	Total/NA

Client Sample ID: DUP-11

Lab Sample ID: 240-119764-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	4.2		2.0	0.86	ug/L	1		8260B SIM	Total/NA
1,1-Dichloroethene	0.99	J	5.0	0.95	ug/L	5		8260B	Total/NA
cis-1,2-Dichloroethene	250		5.0	0.80	ug/L	5		8260B	Total/NA
trans-1,2-Dichloroethene	2.4	J	5.0	0.95	ug/L	5		8260B	Total/NA
Vinyl chloride	380		5.0	1.0	ug/L	5		8260B	Total/NA

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-119764-3

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 - E203728

Job ID: 240-119764-1

Client Sample ID: MW-70_092619

Lab Sample ID: 240-119764-1

Date Collected: 09/26/19 16:09

Matrix: Water

Date Received: 10/01/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	4.2		2.0	0.86	ug/L			10/04/19 16:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		63 - 125					10/04/19 16:19	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	5.0	U	5.0	0.95	ug/L			10/09/19 21:00	5
cis-1,2-Dichloroethene	220		5.0	0.80	ug/L			10/09/19 21:00	5
Tetrachloroethene	5.0	U	5.0	0.75	ug/L			10/09/19 21:00	5
trans-1,2-Dichloroethene	2.1	J	5.0	0.95	ug/L			10/09/19 21:00	5
Trichloroethene	5.0	U	5.0	0.50	ug/L			10/09/19 21:00	5
Vinyl chloride	340		5.0	1.0	ug/L			10/09/19 21:00	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	104		59 - 120					10/09/19 21:00	5
Dibromofluoromethane (Surr)	94		75 - 128					10/09/19 21:00	5
1,2-Dichloroethane-d4 (Surr)	91		70 - 121					10/09/19 21:00	5
Toluene-d8 (Surr)	95		70 - 123					10/09/19 21:00	5

Client Sample Results

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

Job ID: 240-119764-1

Client Sample ID: DUP-11

Lab Sample ID: 240-119764-2

Date Collected: 09/26/19 00:00

Matrix: Water

Date Received: 10/01/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	4.2		2.0	0.86	ug/L			10/04/19 16:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		63 - 125					10/04/19 16:43	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	0.99	J	5.0	0.95	ug/L			10/09/19 21:25	5
cis-1,2-Dichloroethene	250		5.0	0.80	ug/L			10/09/19 21:25	5
Tetrachloroethene	5.0	U	5.0	0.75	ug/L			10/09/19 21:25	5
trans-1,2-Dichloroethene	2.4	J	5.0	0.95	ug/L			10/09/19 21:25	5
Trichloroethene	5.0	U	5.0	0.50	ug/L			10/09/19 21:25	5
Vinyl chloride	380		5.0	1.0	ug/L			10/09/19 21:25	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105		59 - 120					10/09/19 21:25	5
Dibromofluoromethane (Surr)	94		75 - 128					10/09/19 21:25	5
1,2-Dichloroethane-d4 (Surr)	91		70 - 121					10/09/19 21:25	5
Toluene-d8 (Surr)	97		70 - 123					10/09/19 21:25	5

Client Sample Results

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

Job ID: 240-119764-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-119764-3

Date Collected: 09/26/19 00:00

Matrix: Water

Date Received: 10/01/19 09:30

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			10/09/19 21:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			10/09/19 21:49	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			10/09/19 21:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			10/09/19 21:49	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			10/09/19 21:49	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			10/09/19 21:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105		59 - 120		10/09/19 21:49	1
Dibromofluoromethane (Surr)	96		75 - 128		10/09/19 21:49	1
1,2-Dichloroethane-d4 (Surr)	92		70 - 121		10/09/19 21:49	1
Toluene-d8 (Surr)	98		70 - 123		10/09/19 21:49	1

Surrogate Summary

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

Job ID: 240-119764-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB	DBFM	DCA	TOL
		(59-120)	(75-128)	(70-121)	(70-123)
240-119639-A-9 MS	Matrix Spike	104	89	86	98
240-119639-A-9 MSD	Matrix Spike Duplicate	105	88	84	100
240-119764-1	MW-70_092619	104	94	91	95
240-119764-2	DUP-11	105	94	91	97
240-119764-3	TRIP BLANK	105	96	92	98
LCS 240-404863/6	Lab Control Sample	103	88	85	99
MB 240-404863/9	Method Blank	107	92	89	98

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

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

TOL = Toluene-d8 (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)
240-119751-L-7 MS	Matrix Spike	102
240-119751-L-7 MSD	Matrix Spike Duplicate	102
240-119764-1	MW-70_092619	101
240-119764-2	DUP-11	99
LCS 240-404131/4	Lab Control Sample	98
MB 240-404131/5	Method Blank	97

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: 240-119764-1

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

Lab Sample ID: MB 240-404863/9
Matrix: Water
Analysis Batch: 404863

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			10/09/19 13:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			10/09/19 13:38	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			10/09/19 13:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			10/09/19 13:38	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			10/09/19 13:38	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			10/09/19 13:38	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	107		59 - 120		10/09/19 13:38	1
Dibromofluoromethane (Surr)	92		75 - 128		10/09/19 13:38	1
1,2-Dichloroethane-d4 (Surr)	89		70 - 121		10/09/19 13:38	1
Toluene-d8 (Surr)	98		70 - 123		10/09/19 13:38	1

Lab Sample ID: LCS 240-404863/6
Matrix: Water
Analysis Batch: 404863

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	20.0	16.9		ug/L		85	69 - 134
1,1,1,2-Tetrachloroethane	20.0	18.9		ug/L		95	65 - 139
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	17.8		ug/L		89	50 - 156
1,1,2-Trichloroethane	20.0	17.9		ug/L		89	78 - 133
1,1-Dichloroethane	20.0	18.0		ug/L		90	75 - 133
1,1-Dichloroethene	20.0	18.3		ug/L		91	65 - 139
1,2,4-Trichlorobenzene	20.0	16.2		ug/L		81	42 - 133
1,2,4-Trimethylbenzene	20.0	18.5		ug/L		93	74 - 120
1,2-Dibromo-3-Chloropropane	20.0	15.2		ug/L		76	46 - 132
1,2-Dibromoethane	20.0	17.8		ug/L		89	77 - 123
1,2-Dichlorobenzene	20.0	17.6		ug/L		88	78 - 120
1,2-Dichloroethane	20.0	16.9		ug/L		84	71 - 135
1,2-Dichloropropane	20.0	18.4		ug/L		92	78 - 133
1,3,5-Trimethylbenzene	20.0	18.9		ug/L		94	75 - 121
1,3-Dichlorobenzene	20.0	17.6		ug/L		88	78 - 120
1,4-Dichlorobenzene	20.0	17.7		ug/L		88	78 - 120
2-Butanone (MEK)	40.0	30.7		ug/L		77	39 - 163
2-Hexanone	40.0	28.3		ug/L		71	43 - 148
4-Methyl-2-pentanone (MIBK)	40.0	27.9		ug/L		70	49 - 143
Acetone	40.0	30.0		ug/L		75	21 - 162
Benzene	20.0	18.1		ug/L		90	80 - 123
Bromodichloromethane	20.0	17.7		ug/L		88	77 - 125
Bromoform	20.0	15.3		ug/L		76	49 - 141
Bromomethane	20.0	25.5		ug/L		127	41 - 175
Carbon disulfide	20.0	19.6		ug/L		98	60 - 138
Carbon tetrachloride	20.0	16.5		ug/L		83	63 - 140
Chlorobenzene	20.0	18.1		ug/L		91	80 - 121
Chloroethane	20.0	16.4		ug/L		82	33 - 173
Chloroform	20.0	17.9		ug/L		90	79 - 127

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-119764-1

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

Lab Sample ID: LCS 240-404863/6
Matrix: Water
Analysis Batch: 404863

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloromethane	20.0	14.4		ug/L		72	54 - 143
cis-1,2-Dichloroethene	20.0	18.2		ug/L		91	76 - 128
cis-1,3-Dichloropropene	20.0	18.6		ug/L		93	64 - 132
Cyclohexane	20.0	18.7		ug/L		94	58 - 145
Dibromochloromethane	20.0	18.4		ug/L		92	70 - 132
Dichlorodifluoromethane	20.0	11.7		ug/L		59	29 - 148
Diethyl ether	20.0	18.1		ug/L		91	70 - 146
Ethylbenzene	20.0	18.4		ug/L		92	80 - 120
Isopropylbenzene	20.0	17.9		ug/L		90	74 - 120
Methyl acetate	40.0	29.0		ug/L		73	52 - 145
Methyl tert-butyl ether	20.0	16.3		ug/L		81	51 - 133
Methylcyclohexane	20.0	18.1		ug/L		91	60 - 125
Methylene Chloride	20.0	17.6		ug/L		88	70 - 134
Styrene	20.0	18.7		ug/L		93	79 - 120
Tetrachloroethene	20.0	18.2		ug/L		91	74 - 130
Toluene	20.0	18.7		ug/L		94	78 - 129
trans-1,2-Dichloroethene	20.0	18.8		ug/L		94	78 - 133
trans-1,3-Dichloropropene	20.0	17.8		ug/L		89	55 - 128
Trichloroethene	20.0	17.5		ug/L		88	76 - 125
Trichlorofluoromethane	20.0	15.2		ug/L		76	51 - 164
Vinyl chloride	20.0	16.2		ug/L		81	58 - 143
Xylenes, Total	40.0	36.3		ug/L		91	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	103		59 - 120
Dibromofluoromethane (Surr)	88		75 - 128
1,2-Dichloroethane-d4 (Surr)	85		70 - 121
Toluene-d8 (Surr)	99		70 - 123

Lab Sample ID: 240-119639-A-9 MS
Matrix: Water
Analysis Batch: 404863

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
1,1,1-Trichloroethane	130	J	5000	4170		ug/L		81	51 - 138
1,1,1,2-Tetrachloroethane	250	U	5000	4350		ug/L		87	60 - 137
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	5000	4210		ug/L		84	31 - 156
1,1,2-Trichloroethane	250	U	5000	4310		ug/L		86	76 - 132
1,1-Dichloroethane	290		5000	4520		ug/L		85	63 - 136
1,1-Dichloroethene	3300		5000	7770		ug/L		89	53 - 140
1,2,4-Trichlorobenzene	250	U	5000	3790		ug/L		76	30 - 126
1,2-Dibromo-3-Chloropropane	250	U	5000	3460		ug/L		69	38 - 124
1,2-Dibromoethane	250	U	5000	4170		ug/L		83	71 - 123
1,2-Dichlorobenzene	250	U	5000	4150		ug/L		83	64 - 120
1,2-Dichloroethane	250	U	5000	3960		ug/L		79	65 - 135
1,2-Dichloropropane	250	U	5000	4380		ug/L		88	70 - 132
1,3-Dichlorobenzene	250	U	5000	4240		ug/L		85	62 - 120
1,4-Dichlorobenzene	250	U	5000	4210		ug/L		84	63 - 120

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-119764-1

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

Lab Sample ID: 240-119639-A-9 MS

Matrix: Water

Analysis Batch: 404863

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.	Limits
	Result	Qualifier		Result	Qualifier					
2-Butanone (MEK)	2500	U	10000	6860		ug/L		69	37 - 156	
2-Hexanone	2500	U	10000	6250		ug/L		62	42 - 150	
4-Methyl-2-pentanone (MIBK)	2500	U	10000	6100		ug/L		61	44 - 143	
Acetone	2500	U	10000	6740		ug/L		67	10 - 168	
Benzene	250	U	5000	4350		ug/L		87	71 - 122	
Bromodichloromethane	250	U	5000	4220		ug/L		84	64 - 125	
Bromoform	250	U	5000	3540		ug/L		71	44 - 129	
Bromomethane	250	U	5000	6000		ug/L		120	19 - 187	
Carbon disulfide	1300	U	5000	4730		ug/L		95	43 - 144	
Carbon tetrachloride	250	U	5000	3900		ug/L		78	41 - 143	
Chlorobenzene	250	U	5000	4390		ug/L		88	70 - 123	
Chloroethane	250	U	5000	4050		ug/L		81	11 - 189	
Chloroform	250	U	5000	4270		ug/L		85	68 - 130	
Chloromethane	250	U	5000	3500		ug/L		70	31 - 154	
cis-1,2-Dichloroethene	3000		5000	7230		ug/L		86	64 - 130	
cis-1,3-Dichloropropene	250	U	5000	4350		ug/L		87	48 - 127	
Cyclohexane	250	U	5000	4470		ug/L		89	42 - 135	
Dibromochloromethane	250	U	5000	4300		ug/L		86	60 - 129	
Dichlorodifluoromethane	250	U	5000	2870		ug/L		57	28 - 136	
Ethylbenzene	250	U	5000	4410		ug/L		88	66 - 120	
Isopropylbenzene	250	U	5000	4310		ug/L		86	59 - 120	
Methyl acetate	2500	U	10000	6570		ug/L		66	41 - 142	
Methyl tert-butyl ether	250	U	5000	3820		ug/L		76	41 - 136	
Methylcyclohexane	250	U	5000	4290		ug/L		86	37 - 123	
Methylene Chloride	1300	U	5000	4300		ug/L		86	61 - 130	
Styrene	250	U	5000	4480		ug/L		90	68 - 120	
Tetrachloroethene	7400		5000	11900		ug/L		90	51 - 136	
Toluene	250	U	5000	4570		ug/L		91	62 - 132	
trans-1,2-Dichloroethene	250	U	5000	4570		ug/L		91	68 - 133	
trans-1,3-Dichloropropene	250	U	5000	4110		ug/L		82	40 - 125	
Trichloroethene	1700		5000	6000		ug/L		85	55 - 131	
Trichlorofluoromethane	250	U	5000	3830		ug/L		77	37 - 174	
Vinyl chloride	170	J	5000	4240		ug/L		81	43 - 154	
Xylenes, Total	500	U	10000	8850		ug/L		89	67 - 120	

Surrogate	MS	MS	Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	104		59 - 120
Dibromofluoromethane (Surr)	89		75 - 128
1,2-Dichloroethane-d4 (Surr)	86		70 - 121
Toluene-d8 (Surr)	98		70 - 123

Lab Sample ID: 240-119639-A-9 MSD

Matrix: Water

Analysis Batch: 404863

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	Limits	RPD	Limit
	Result	Qualifier		Result	Qualifier							
1,1,1-Trichloroethane	130	J	5000	4460		ug/L		87	51 - 138	7	27	
1,1,2,2-Tetrachloroethane	250	U	5000	4810		ug/L		96	60 - 137	10	31	

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-119764-1

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

Lab Sample ID: 240-119639-A-9 MSD

Client Sample ID: Matrix Spike Duplicate

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 404863

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	5000	4710		ug/L		94	31 - 156	11	35
1,1,2-Trichloroethane	250	U	5000	4650		ug/L		93	76 - 132	8	25
1,1-Dichloroethane	290		5000	4850		ug/L		91	63 - 136	7	23
1,1-Dichloroethene	3300		5000	7950		ug/L		93	53 - 140	2	35
1,2,4-Trichlorobenzene	250	U	5000	4210		ug/L		84	30 - 126	11	35
1,2-Dibromo-3-Chloropropane	250	U	5000	4040		ug/L		81	38 - 124	15	35
1,2-Dibromoethane	250	U	5000	4570		ug/L		91	71 - 123	9	27
1,2-Dichlorobenzene	250	U	5000	4600		ug/L		92	64 - 120	10	30
1,2-Dichloroethane	250	U	5000	4170		ug/L		83	65 - 135	5	24
1,2-Dichloropropane	250	U	5000	4680		ug/L		94	70 - 132	7	26
1,3-Dichlorobenzene	250	U	5000	4530		ug/L		91	62 - 120	6	31
1,4-Dichlorobenzene	250	U	5000	4580		ug/L		92	63 - 120	8	28
2-Butanone (MEK)	2500	U	10000	7850		ug/L		79	37 - 156	13	35
2-Hexanone	2500	U	10000	7430		ug/L		74	42 - 150	17	35
4-Methyl-2-pentanone (MIBK)	2500	U	10000	7000		ug/L		70	44 - 143	14	35
Acetone	2500	U	10000	7820		ug/L		78	10 - 168	15	35
Benzene	250	U	5000	4550		ug/L		91	71 - 122	4	22
Bromodichloromethane	250	U	5000	4380		ug/L		88	64 - 125	4	27
Bromoform	250	U	5000	3940		ug/L		79	44 - 129	11	28
Bromomethane	250	U	5000	6560		ug/L		131	19 - 187	9	35
Carbon disulfide	1300	U	5000	4890		ug/L		98	43 - 144	3	33
Carbon tetrachloride	250	U	5000	4190		ug/L		84	41 - 143	7	30
Chlorobenzene	250	U	5000	4660		ug/L		93	70 - 123	6	23
Chloroethane	250	U	5000	4030		ug/L		81	11 - 189	0	35
Chloroform	250	U	5000	4430		ug/L		89	68 - 130	4	23
Chloromethane	250	U	5000	3550		ug/L		71	31 - 154	1	35
cis-1,2-Dichloroethene	3000		5000	7460		ug/L		90	64 - 130	3	21
cis-1,3-Dichloropropene	250	U	5000	4640		ug/L		93	48 - 127	6	30
Cyclohexane	250	U	5000	4790		ug/L		96	42 - 135	7	35
Dibromochloromethane	250	U	5000	4710		ug/L		94	60 - 129	9	26
Dichlorodifluoromethane	250	U	5000	2960		ug/L		59	28 - 136	3	35
Ethylbenzene	250	U	5000	4670		ug/L		93	66 - 120	6	24
Isopropylbenzene	250	U	5000	4640		ug/L		93	59 - 120	7	31
Methyl acetate	2500	U	10000	7360		ug/L		74	41 - 142	11	35
Methyl tert-butyl ether	250	U	5000	4160		ug/L		83	41 - 136	9	29
Methylcyclohexane	250	U	5000	4740		ug/L		95	37 - 123	10	35
Methylene Chloride	1300	U	5000	4430		ug/L		89	61 - 130	3	29
Styrene	250	U	5000	4810		ug/L		96	68 - 120	7	26
Tetrachloroethene	7400		5000	12500		ug/L		103	51 - 136	6	23
Toluene	250	U	5000	4860		ug/L		97	62 - 132	6	23
trans-1,2-Dichloroethene	250	U	5000	4720		ug/L		94	68 - 133	3	24
trans-1,3-Dichloropropene	250	U	5000	4490		ug/L		90	40 - 125	9	27
Trichloroethene	1700		5000	6200		ug/L		89	55 - 131	3	23
Trichlorofluoromethane	250	U	5000	3880		ug/L		78	37 - 174	1	35
Vinyl chloride	170	J	5000	4230		ug/L		81	43 - 154	0	29
Xylenes, Total	500	U	10000	9420		ug/L		94	67 - 120	6	25

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-119764-1

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

Lab Sample ID: 240-119639-A-9 MSD
Matrix: Water
Analysis Batch: 404863

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

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	105		59 - 120
Dibromofluoromethane (Surr)	88		75 - 128
1,2-Dichloroethane-d4 (Surr)	84		70 - 121
Toluene-d8 (Surr)	100		70 - 123

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

Lab Sample ID: MB 240-404131/5
Matrix: Water
Analysis Batch: 404131

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			10/04/19 13:00	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		63 - 125		10/04/19 13:00	1

Lab Sample ID: LCS 240-404131/4
Matrix: Water
Analysis Batch: 404131

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	11.6		ug/L		116	59 - 131

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	98		63 - 125

Lab Sample ID: 240-119751-L-7 MS
Matrix: Water
Analysis Batch: 404131

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	14		10.0	24.3		ug/L		106	52 - 129

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	102		63 - 125

Lab Sample ID: 240-119751-L-7 MSD
Matrix: Water
Analysis Batch: 404131

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	14		10.0	26.5		ug/L		129	52 - 129	9	13

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	102		63 - 125

Eurofins TestAmerica, Canton

QC Association Summary

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

Job ID: 240-119764-1

GC/MS VOA

Analysis Batch: 404131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-119764-1	MW-70_092619	Total/NA	Water	8260B SIM	
240-119764-2	DUP-11	Total/NA	Water	8260B SIM	
MB 240-404131/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-404131/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-119751-L-7 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-119751-L-7 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 404863

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-119764-1	MW-70_092619	Total/NA	Water	8260B	
240-119764-2	DUP-11	Total/NA	Water	8260B	
240-119764-3	TRIP BLANK	Total/NA	Water	8260B	
MB 240-404863/9	Method Blank	Total/NA	Water	8260B	
LCS 240-404863/6	Lab Control Sample	Total/NA	Water	8260B	
240-119639-A-9 MS	Matrix Spike	Total/NA	Water	8260B	
240-119639-A-9 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

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

Job ID: 240-119764-1

Client Sample ID: MW-70_092619

Lab Sample ID: 240-119764-1

Date Collected: 09/26/19 16:09

Matrix: Water

Date Received: 10/01/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5	404863	10/09/19 21:00	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	404131	10/04/19 16:19	SAM	TAL CAN

Client Sample ID: DUP-11

Lab Sample ID: 240-119764-2

Date Collected: 09/26/19 00:00

Matrix: Water

Date Received: 10/01/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5	404863	10/09/19 21:25	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	404131	10/04/19 16:43	SAM	TAL CAN

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-119764-3

Date Collected: 09/26/19 00:00

Matrix: Water

Date Received: 10/01/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	404863	10/09/19 21:49	HMB	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: 240-119764-1

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-20
Connecticut	State	PH-0590	12-31-19
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-20
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-20
Kansas	NELAP	E-10336	04-30-20
Kentucky (UST)	State	112225	02-23-20
Kentucky (WW)	State	KY98016	12-31-19
Minnesota	NELAP	OH00048	12-31-19
Minnesota (Petrofund)	State Program	3506	07-31-21
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-23-20
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-16-00404	12-28-19
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-20
West Virginia DEP	State	210	12-31-19

Eurofins TestAmerica Canton Sample Receipt Form/Narrative

Login # : 112764


Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: [Signature]
 Cooler Received on 10-01-19 Opened on 10-01-19
 FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time

Storage Location

TestAmerica Cooler # 1A 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-10 (CF +0.7 °C) Observed Cooler Temp. 4.6 °C Corrected Cooler Temp. 5.3 °C
 IR GUN #IR-11 (CF +0.9 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 4 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?
 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# HC991818
 13. Were VOAs on the COC? Yes No
 14. Were air bubbles >6 mm in any VOA vials? Yes No NA  ← Larger than this.
 15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # NA 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:

AG

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: _____