

ANALYTICAL REPORT

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

Laboratory Job ID: 240-159538-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey



Authorized for release by:
11/22/2021 10:20:58 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 - Off-Site

Job ID: 240-159538-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery 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.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

Job ID: 240-159538-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-159538-1

Comments

No additional comments.

Receipt

The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1° C.

GC/MS VOA

Method 8260B: The continuing calibration verification (CCV) for analytical batch 512679 exceeded control criteria for one or multiple compounds. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: MW-206_110121 (240-159538-3).

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

VOA Prep

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

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

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

Protocol References:

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

Laboratory References:

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

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Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159538-1	TRIP BLANK_37	Water	11/01/21 00:00	11/06/21 08:00
240-159538-2	MW-206S_110121	Water	11/01/21 11:20	11/06/21 08:00
240-159538-3	MW-206_110121	Water	11/01/21 10:30	11/06/21 08:00

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Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

Client Sample ID: TRIP BLANK_37

Lab Sample ID: 240-159538-1

No Detections.

Client Sample ID: MW-206S_110121

Lab Sample ID: 240-159538-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	3.3		1.0	0.44	ug/L		1	8260B	Total/NA

Client Sample ID: MW-206_110121

Lab Sample ID: 240-159538-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	32	J	33	15	ug/L	33.33		8260B	Total/NA
trans-1,2-Dichloroethene	88		33	17	ug/L	33.33		8260B	Total/NA
Trichloroethene	1100		33	15	ug/L	33.33		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

Client Sample ID: TRIP BLANK_37

Lab Sample ID: 240-159538-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 05:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 05:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 05:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 05:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		62 - 137		11/12/21 05:01	1
4-Bromofluorobenzene (Surr)	85		56 - 136		11/12/21 05:01	1
Toluene-d8 (Surr)	115		78 - 122		11/12/21 05:01	1
Dibromofluoromethane (Surr)	104		73 - 120		11/12/21 05:01	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

Client Sample ID: MW-206S_110121

Lab Sample ID: 240-159538-2

Date Collected: 11/01/21 11:20

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 05:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 05:23	1
Trichloroethene	3.3		1.0	0.44	ug/L			11/12/21 05:23	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 05:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	105		62 - 137		11/12/21 05:23	1
4-Bromofluorobenzene (Surr)	84		56 - 136		11/12/21 05:23	1
Toluene-d8 (Surr)	115		78 - 122		11/12/21 05:23	1
Dibromofluoromethane (Surr)	105		73 - 120		11/12/21 05:23	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

Client Sample ID: MW-206_110121

Lab Sample ID: 240-159538-3

Date Collected: 11/01/21 10:30

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	32	J	33	15	ug/L			11/12/21 16:23	33.33
trans-1,2-Dichloroethene	88		33	17	ug/L			11/12/21 16:23	33.33
Trichloroethene	1100		33	15	ug/L			11/12/21 16:23	33.33
Vinyl chloride	33	U	33	15	ug/L			11/12/21 16:23	33.33

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	123		62 - 137		11/12/21 16:23	33.33
4-Bromofluorobenzene (Surr)	67		56 - 136		11/12/21 16:23	33.33
Toluene-d8 (Surr)	90		78 - 122		11/12/21 16:23	33.33
Dibromofluoromethane (Surr)	109		73 - 120		11/12/21 16:23	33.33

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA	BFB	TOL	DBFM
		(62-137)	(56-136)	(78-122)	(73-120)
240-159538-1	TRIP BLANK_37	103	85	115	104
240-159538-2	MW-206S_110121	105	84	115	105
240-159538-3	MW-206_110121	123	67	90	109
240-159539-B-5 MS	Matrix Spike	96	94	116	97
240-159539-B-5 MSD	Matrix Spike Duplicate	90	87	108	92
240-159556-B-5 MS	Matrix Spike	105	94	102	98
240-159556-B-5 MSD	Matrix Spike Duplicate	102	98	100	92
LCS 240-512565/4	Lab Control Sample	89	87	107	90
LCS 240-512679/4	Lab Control Sample	100	99	99	89
MB 240-512565/6	Method Blank	92	73	102	90
MB 240-512679/7	Method Blank	117	69	91	103

Surrogate Legend

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

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

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

Lab Sample ID: MB 240-512565/6
Matrix: Water
Analysis Batch: 512565

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 23:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 23:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 23:50	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	92		62 - 137		11/11/21 23:50	1
4-Bromofluorobenzene (Surr)	73		56 - 136		11/11/21 23:50	1
Toluene-d8 (Surr)	102		78 - 122		11/11/21 23:50	1
Dibromofluoromethane (Surr)	90		73 - 120		11/11/21 23:50	1

Lab Sample ID: LCS 240-512565/4
Matrix: Water
Analysis Batch: 512565

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

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	77 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.95		ug/L		90	70 - 122
Vinyl chloride	10.0	9.56		ug/L		96	60 - 144

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	89		62 - 137
4-Bromofluorobenzene (Surr)	87		56 - 136
Toluene-d8 (Surr)	107		78 - 122
Dibromofluoromethane (Surr)	90		73 - 120

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	%Rec. Limits
				Result	Qualifier				
cis-1,2-Dichloroethene	43		250	285		ug/L		97	66 - 128
trans-1,2-Dichloroethene	86		250	316		ug/L		92	56 - 136
Trichloroethene	830	F1	250	936	F1	ug/L		41	61 - 124
Vinyl chloride	25	U	250	246		ug/L		99	43 - 157

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	96		62 - 137
4-Bromofluorobenzene (Surr)	94		56 - 136
Toluene-d8 (Surr)	116		78 - 122
Dibromofluoromethane (Surr)	97		73 - 120

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

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

Lab Sample ID: 240-159539-B-5 MSD
Matrix: Water
Analysis Batch: 512565

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
cis-1,2-Dichloroethene	43		250	272		ug/L		92	66 - 128	5	14
trans-1,2-Dichloroethene	86		250	297		ug/L		84	56 - 136	6	15
Trichloroethene	830	F1	250	885	F1	ug/L		21	61 - 124	6	15
Vinyl chloride	25	U	250	233		ug/L		93	43 - 157	6	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		62 - 137
4-Bromofluorobenzene (Surr)	87		56 - 136
Toluene-d8 (Surr)	108		78 - 122
Dibromofluoromethane (Surr)	92		73 - 120

Lab Sample ID: MB 240-512679/7
Matrix: Water
Analysis Batch: 512679

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 12:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 12:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 12:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 12:01	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	117		62 - 137		11/12/21 12:01	1
4-Bromofluorobenzene (Surr)	69		56 - 136		11/12/21 12:01	1
Toluene-d8 (Surr)	91		78 - 122		11/12/21 12:01	1
Dibromofluoromethane (Surr)	103		73 - 120		11/12/21 12:01	1

Lab Sample ID: LCS 240-512679/4
Matrix: Water
Analysis Batch: 512679

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	75 - 124
Trichloroethene	10.0	8.95		ug/L		89	70 - 122
Vinyl chloride	10.0	7.65		ug/L		77	60 - 144

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	100		62 - 137
4-Bromofluorobenzene (Surr)	99		56 - 136
Toluene-d8 (Surr)	99		78 - 122
Dibromofluoromethane (Surr)	89		73 - 120

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

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

Lab Sample ID: 240-159556-B-5 MS
Matrix: Water
Analysis Batch: 512679

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
cis-1,2-Dichloroethene	20	U	200	208		ug/L		104	66 - 128
trans-1,2-Dichloroethene	20	U	200	211		ug/L		106	56 - 136
Trichloroethene	20	U	200	175		ug/L		87	61 - 124
Vinyl chloride	20	U	200	166		ug/L		83	43 - 157

Surrogate	MS %Recovery	MS Qualifier	MS Limits
1,2-Dichloroethane-d4 (Surr)	105		62 - 137
4-Bromofluorobenzene (Surr)	94		56 - 136
Toluene-d8 (Surr)	102		78 - 122
Dibromofluoromethane (Surr)	98		73 - 120

Lab Sample ID: 240-159556-B-5 MSD
Matrix: Water
Analysis Batch: 512679

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
cis-1,2-Dichloroethene	20	U	200	200		ug/L		100	66 - 128	4	14
trans-1,2-Dichloroethene	20	U	200	205		ug/L		103	56 - 136	3	15
Trichloroethene	20	U	200	176		ug/L		88	61 - 124	1	15
Vinyl chloride	20	U	200	166		ug/L		83	43 - 157	0	24

Surrogate	MSD %Recovery	MSD Qualifier	MSD Limits
1,2-Dichloroethane-d4 (Surr)	102		62 - 137
4-Bromofluorobenzene (Surr)	98		56 - 136
Toluene-d8 (Surr)	100		78 - 122
Dibromofluoromethane (Surr)	92		73 - 120

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

GC/MS VOA

Analysis Batch: 512565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159538-1	TRIP BLANK_37	Total/NA	Water	8260B	
240-159538-2	MW-206S_110121	Total/NA	Water	8260B	
MB 240-512565/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512565/4	Lab Control Sample	Total/NA	Water	8260B	
240-159539-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159539-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 512679

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159538-3	MW-206_110121	Total/NA	Water	8260B	
MB 240-512679/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512679/4	Lab Control Sample	Total/NA	Water	8260B	
240-159556-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159556-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

Client Sample ID: TRIP BLANK_37

Lab Sample ID: 240-159538-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 05:01	LEE	TAL CAN

Client Sample ID: MW-206S_110121

Lab Sample ID: 240-159538-2

Date Collected: 11/01/21 11:20

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 05:23	LEE	TAL CAN

Client Sample ID: MW-206_110121

Lab Sample ID: 240-159538-3

Date Collected: 11/01/21 10:30

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		33.33	512679	11/12/21 16:23	LEE	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 - Off-Site

Job ID: 240-159538-1

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	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

Client Project Manager: Kris Hinskey
 Telephone: 248-994-2240
 Email: kris@hinskey.com

Site Contact: Julia McClafferty
 Telephone: 734-644-5131

Lab Contact: Mike DelMontico
 Telephone: 330-497-9396

Company Name: Arcadis
 Address: 28550 Cabot Drive, Suite 500
 City/State/Zip: Novi, MI, 48377

Phone: 248-994-2240

Project Name: Ford LTP OIE-Site
 Project Number: 30080642.402.04
 PO # 30080642.402.04

Sampler Name: SETH TURVER
 Method of Shipment/Carrier:
 Shipping/Tracking No:

Sample Identification	Sample Date	Sample Time	Matrix				Containers & Preservatives				Filtered Sample (Y/N)	Composite=C / Grab=C	Analyses										Sample Specific Notes / Special Instructions:		
			Air	Aqueous	Sediment	Solid	Other:	H2SO4	HNO3	HCl			NaOH	NaOH	NaOH	Other:	ms-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM			
TRIP BLANK_37	---	---	X																						1 Trip Blank
MW-206S-110121	11/121	1120		3																					3 VOAs for 8260B 3 VOAs for 8260B-SIM
MW-206-110121	11/121	1030		3																					

240-159538 Chain of Custody

Possible Hazard Identification
 Non-Hazard Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments:
 Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
 Level IV Reporting requested.

Relinquished by: *SETH TURVER*
 Relinquished by: *Chris Turver*
 Relinquished by: *Sen Ford*

Received by: *NOVE COLD STORAGE*
 Received by: *Sen Ford*
 Received in Laboratory by: *M. S.*

Company: ARCADIS
 Company: ARCADIS
 Company: ETA

Date/Time: 11/121/1500
 Date/Time: 11/5/21/1435
 Date/Time: 11/5/21/1448

Company: 11/121 / ARCADIS
 Company: ETA
 Company: ETA

Date/Time: 11/4/21/1500
 Date/Time: 11/5/21/1435
 Date/Time: 11/6/21/8:00

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return to Client Disposal By Lab Archive For _____ Months

Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 159538
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Matthew Swana
Cooler Received on 11/6/21 Opened on 11/6/21
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: Wei Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.0 °C Corrected Cooler Temp. 1.1 °C
IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
-Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
-Were tamper/custody seals intact and uncompromised? Yes No NA

3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
If yes, Questions 13-17 have been checked at the originating laboratory.

13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC157842
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? Yes No NA  ← Larger than this.
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 01042016 Yes No
17. Was a LL Hg or Me Hg trip blank present? Yes No No

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

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

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page Samples processed by: [Signature]

19. 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)

20. 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: _____

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 240-159538-1

Login Number: 159538

List Source: Eurofins TestAmerica, Canton

List Number: 1

Creator: Cribley, Ryan D

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		



DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159538-1
Sample date: 2021-11-01
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:3
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers:
GCMS VOC QC batch 512565.

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

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at <http://clms.cadenaco.com/index.cfm>.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia, Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 159538-1

Sample Name:	TRIP BLANK_37	MW-206S_110121	MW-206_110121
Lab Sample ID:	2401595381	2401595382	2401595383
Sample Date:	11/1/2021	11/1/2021	11/1/2021

Analyte	Cas No.	Report		Units	Valid Qualifier	Report		Units	Valid Qualifier	Report		Units	Valid Qualifier
		Result	Limit			Result	Limit			Result	Limit		
GC/MS VOC													
<u>OSW-8260B</u>													
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	32	33	ug/l	J
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	88	33	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	3.3	1.0	ug/l	---	1100	33	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	33	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG # 240-159538-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:

TestAmerica

North Canton, Ohio

Report # 43674R

Review Level: Tier III

Project: 30080642.402.04



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159538-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_37	240-159538-1	Water	11/01/21		X	
MW-206S_110121	240-159538-2	Water	11/01/21		X	
MW-206_110121	240-159538-3	Water	11/01/21		X	

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
 - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
 - J+ The result is an estimated quantity, but the result may be biased high.
 - J- The result is an estimated quantity, but the result may be biased low.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

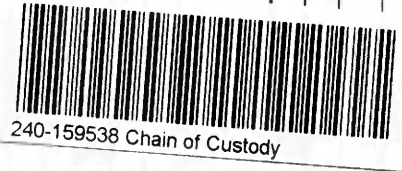
**CHAIN OF CUSTODY
CORRECTED SAMPLE ANALYSIS DATA
SHEETS**



Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Client Contact		Regulatory program: <input type="checkbox"/> DW <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> Other										TestAmerica Laboratories, Inc.														
Company Name: Arcadis		Client Project Manager: Kris Hinskey				Site Contact: Julia McClafferty				Lab Contact: Mike DelMonico				COC No:												
Address: 28550 Cabot Drive, Suite 500		Telephone: 248-994-2240				Telephone: 734-644-5131				Telephone: 330-497-9396				1 of 1 COCs												
City/State/Zip: Navi, MI, 48377		Email: kristoffer.hinskey@arcadis.com				Analysis Turnaround Time				Analyses				For lab use only												
Phone: 248-994-2240		Sampler Name: SETH TURNER				TAT if different from below								Walk-in client												
Project Name: Ford LTP Off-Site		Method of Shipment/Carrier:				10 day <input checked="" type="checkbox"/> 3 weeks <input type="checkbox"/>								Lab sampling												
Project Number: 30080642.402.04		Shipping/Tracking No:				<input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/>								Job/SDG No:												
PO # 30080642.402.04						<input type="checkbox"/> 1 week <input type="checkbox"/>																				
						<input type="checkbox"/> 2 days <input type="checkbox"/>																				
						<input type="checkbox"/> 1 day <input type="checkbox"/>																				
Sample Identification		Sample Date	Sample Time	Matrix			Containers & Preservatives							Sample Specific Notes / Special Instructions:												
				Air	Aqueous	Sediment	Solid	Other:	H2SO4	HNO3	HCl	NaOH	ZnAc	NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	
TRIP BLANK_37		---	---	X							1						NG	G	X	X	X	X	X			1 Trip Blank
MW-206S_110121		11/1/21	1120	3							3						NG	G	X	X		X	X			3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-206_110121		11/1/21	1030	3							3						NG	G	X	X		X	X			



Page 494 of 496

11/22/2021

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Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159538-1

Client Sample ID: TRIP BLANK_37

Lab Sample ID: 240-159538-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 05:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 05:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 05:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 05:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		62 - 137		11/12/21 05:01	1
4-Bromofluorobenzene (Surr)	85		56 - 136		11/12/21 05:01	1
Toluene-d8 (Surr)	115		78 - 122		11/12/21 05:01	1
Dibromofluoromethane (Surr)	104		73 - 120		11/12/21 05:01	1

Client Sample ID: MW-206S_110121

Lab Sample ID: 240-159538-2

Date Collected: 11/01/21 11:20

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 05:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 05:23	1
Trichloroethene	3.3		1.0	0.44	ug/L			11/12/21 05:23	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 05:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	105		62 - 137		11/12/21 05:23	1
4-Bromofluorobenzene (Surr)	84		56 - 136		11/12/21 05:23	1
Toluene-d8 (Surr)	115		78 - 122		11/12/21 05:23	1
Dibromofluoromethane (Surr)	105		73 - 120		11/12/21 05:23	1

Client Sample ID: MW-206_110121

Lab Sample ID: 240-159538-3

Date Collected: 11/01/21 10:30

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	32	J	33	15	ug/L			11/12/21 16:23	33.33
trans-1,2-Dichloroethene	88		33	17	ug/L			11/12/21 16:23	33.33
Trichloroethene	1100		33	15	ug/L			11/12/21 16:23	33.33
Vinyl chloride	33	U	33	15	ug/L			11/12/21 16:23	33.33

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	123		62 - 137		11/12/21 16:23	33.33
4-Bromofluorobenzene (Surr)	67		56 - 136		11/12/21 16:23	33.33
Toluene-d8 (Surr)	90		78 - 122		11/12/21 16:23	33.33
Dibromofluoromethane (Surr)	109		73 - 120		11/12/21 16:23	33.33

ANALYTICAL REPORT

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

Laboratory Job ID: 240-159539-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey



Authorized for release by:
11/22/2021 10:21:23 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery 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.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Job ID: 240-159539-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-159539-1

Comments

No additional comments.

Receipt

The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4° C.

GC/MS VOA

Method 8260B: The continuing calibration verification (CCV) for analytical batch 512679 exceeded control criteria for one or multiple compounds. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_16 (240-159539-1).

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

VOA Prep

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



Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Method	Method Description	Protocol	Laboratory
8260B	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

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

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159539-1	TRIP BLANK_16	Water	11/02/21 00:00	11/06/21 08:00
240-159539-2	MW-202S_110221	Water	11/02/21 12:31	11/06/21 08:00
240-159539-3	MW-202_110221	Water	11/02/21 13:46	11/06/21 08:00
240-159539-4	MW-203S_110221	Water	11/02/21 18:16	11/06/21 08:00
240-159539-5	MW-203_110221	Water	11/02/21 19:16	11/06/21 08:00

- 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 - Off-Site

Job ID: 240-159539-1

Client Sample ID: TRIP BLANK_16

Lab Sample ID: 240-159539-1

No Detections.

Client Sample ID: MW-202S_110221

Lab Sample ID: 240-159539-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.52	J	1.0	0.44	ug/L	1		8260B	Total/NA

Client Sample ID: MW-202_110221

Lab Sample ID: 240-159539-3

No Detections.

Client Sample ID: MW-203S_110221

Lab Sample ID: 240-159539-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
trans-1,2-Dichloroethene	0.82	J	1.0	0.51	ug/L	1		8260B	Total/NA
Trichloroethene	18		1.0	0.44	ug/L	1		8260B	Total/NA

Client Sample ID: MW-203_110221

Lab Sample ID: 240-159539-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	43		25	12	ug/L	25		8260B	Total/NA
trans-1,2-Dichloroethene	86		25	13	ug/L	25		8260B	Total/NA
Trichloroethene	830	F1	25	11	ug/L	25		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: TRIP BLANK_16

Lab Sample ID: 240-159539-1

Date Collected: 11/02/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 16:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 16:45	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 16:45	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 16:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	126		62 - 137		11/12/21 16:45	1
4-Bromofluorobenzene (Surr)	66		56 - 136		11/12/21 16:45	1
Toluene-d8 (Surr)	87		78 - 122		11/12/21 16:45	1
Dibromofluoromethane (Surr)	111		73 - 120		11/12/21 16:45	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-202S_110221

Lab Sample ID: 240-159539-2

Date Collected: 11/02/21 12:31

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 06:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 06:31	1
Trichloroethene	0.52	J	1.0	0.44	ug/L			11/12/21 06:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 06:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		62 - 137		11/12/21 06:31	1
4-Bromofluorobenzene (Surr)	69		56 - 136		11/12/21 06:31	1
Toluene-d8 (Surr)	104		78 - 122		11/12/21 06:31	1
Dibromofluoromethane (Surr)	92		73 - 120		11/12/21 06:31	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-202_110221

Lab Sample ID: 240-159539-3

Date Collected: 11/02/21 13:46

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 06:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 06:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 06:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 06:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		62 - 137		11/12/21 06:53	1
4-Bromofluorobenzene (Surr)	75		56 - 136		11/12/21 06:53	1
Toluene-d8 (Surr)	106		78 - 122		11/12/21 06:53	1
Dibromofluoromethane (Surr)	96		73 - 120		11/12/21 06:53	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-203S_110221

Lab Sample ID: 240-159539-4

Date Collected: 11/02/21 18:16

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 07:16	1
trans-1,2-Dichloroethene	0.82	J	1.0	0.51	ug/L			11/12/21 07:16	1
Trichloroethene	18		1.0	0.44	ug/L			11/12/21 07:16	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 07:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		62 - 137		11/12/21 07:16	1
4-Bromofluorobenzene (Surr)	77		56 - 136		11/12/21 07:16	1
Toluene-d8 (Surr)	113		78 - 122		11/12/21 07:16	1
Dibromofluoromethane (Surr)	97		73 - 120		11/12/21 07:16	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-203_110221

Lab Sample ID: 240-159539-5

Date Collected: 11/02/21 19:16

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	43		25	12	ug/L			11/12/21 07:38	25
trans-1,2-Dichloroethene	86		25	13	ug/L			11/12/21 07:38	25
Trichloroethene	830	F1	25	11	ug/L			11/12/21 07:38	25
Vinyl chloride	25	U	25	11	ug/L			11/12/21 07:38	25

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	90		62 - 137		11/12/21 07:38	25
4-Bromofluorobenzene (Surr)	73		56 - 136		11/12/21 07:38	25
Toluene-d8 (Surr)	103		78 - 122		11/12/21 07:38	25
Dibromofluoromethane (Surr)	91		73 - 120		11/12/21 07:38	25



Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA	BFB	TOL	DBFM
		(62-137)	(56-136)	(78-122)	(73-120)
240-159539-1	TRIP BLANK_16	126	66	87	111
240-159539-2	MW-202S_110221	91	69	104	92
240-159539-3	MW-202_110221	96	75	106	96
240-159539-4	MW-203S_110221	97	77	113	97
240-159539-5	MW-203_110221	90	73	103	91
240-159539-5 MS	MW-203_110221	96	94	116	97
240-159539-5 MSD	MW-203_110221	90	87	108	92
240-159556-B-5 MS	Matrix Spike	105	94	102	98
240-159556-B-5 MSD	Matrix Spike Duplicate	102	98	100	92
LCS 240-512565/4	Lab Control Sample	89	87	107	90
LCS 240-512679/4	Lab Control Sample	100	99	99	89
MB 240-512565/6	Method Blank	92	73	102	90
MB 240-512679/7	Method Blank	117	69	91	103

Surrogate Legend

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

BFB = 4-Bromofluorobenzene (Surr)

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane (Surr)

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

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

Lab Sample ID: MB 240-512565/6
Matrix: Water
Analysis Batch: 512565

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 23:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 23:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 23:50	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	92		62 - 137		11/11/21 23:50	1
4-Bromofluorobenzene (Surr)	73		56 - 136		11/11/21 23:50	1
Toluene-d8 (Surr)	102		78 - 122		11/11/21 23:50	1
Dibromofluoromethane (Surr)	90		73 - 120		11/11/21 23:50	1

Lab Sample ID: LCS 240-512565/4
Matrix: Water
Analysis Batch: 512565

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

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	77 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.95		ug/L		90	70 - 122
Vinyl chloride	10.0	9.56		ug/L		96	60 - 144

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	89		62 - 137
4-Bromofluorobenzene (Surr)	87		56 - 136
Toluene-d8 (Surr)	107		78 - 122
Dibromofluoromethane (Surr)	90		73 - 120

Lab Sample ID: 240-159539-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: MW-203_110221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	%Rec. Limits
				Result	Qualifier				
cis-1,2-Dichloroethene	43		250	285		ug/L		97	66 - 128
trans-1,2-Dichloroethene	86		250	316		ug/L		92	56 - 136
Trichloroethene	830	F1	250	936	F1	ug/L		41	61 - 124
Vinyl chloride	25	U	250	246		ug/L		99	43 - 157

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	96		62 - 137
4-Bromofluorobenzene (Surr)	94		56 - 136
Toluene-d8 (Surr)	116		78 - 122
Dibromofluoromethane (Surr)	97		73 - 120

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

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

Lab Sample ID: 240-159539-5 MSD
Matrix: Water
Analysis Batch: 512565

Client Sample ID: MW-203_110221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	43		250	272		ug/L		92	66 - 128	5	14
trans-1,2-Dichloroethene	86		250	297		ug/L		84	56 - 136	6	15
Trichloroethene	830	F1	250	885	F1	ug/L		21	61 - 124	6	15
Vinyl chloride	25	U	250	233		ug/L		93	43 - 157	6	24
MSD MSD											
Surrogate	%Recovery	Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	90		62 - 137								
4-Bromofluorobenzene (Surr)	87		56 - 136								
Toluene-d8 (Surr)	108		78 - 122								
Dibromofluoromethane (Surr)	92		73 - 120								

Lab Sample ID: MB 240-512679/7
Matrix: Water
Analysis Batch: 512679

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 12:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 12:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 12:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 12:01	1
MB MB									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	117		62 - 137					11/12/21 12:01	1
4-Bromofluorobenzene (Surr)	69		56 - 136					11/12/21 12:01	1
Toluene-d8 (Surr)	91		78 - 122					11/12/21 12:01	1
Dibromofluoromethane (Surr)	103		73 - 120					11/12/21 12:01	1

Lab Sample ID: LCS 240-512679/4
Matrix: Water
Analysis Batch: 512679

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	75 - 124
Trichloroethene	10.0	8.95		ug/L		89	70 - 122
Vinyl chloride	10.0	7.65		ug/L		77	60 - 144
LCS LCS							
Surrogate	%Recovery	Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	100		62 - 137				
4-Bromofluorobenzene (Surr)	99		56 - 136				
Toluene-d8 (Surr)	99		78 - 122				
Dibromofluoromethane (Surr)	89		73 - 120				

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

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

Lab Sample ID: 240-159556-B-5 MS
Matrix: Water
Analysis Batch: 512679

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
cis-1,2-Dichloroethene	20	U	200	208		ug/L		104	66 - 128
trans-1,2-Dichloroethene	20	U	200	211		ug/L		106	56 - 136
Trichloroethene	20	U	200	175		ug/L		87	61 - 124
Vinyl chloride	20	U	200	166		ug/L		83	43 - 157

Surrogate	MS %Recovery	MS Qualifier	MS Limits
1,2-Dichloroethane-d4 (Surr)	105		62 - 137
4-Bromofluorobenzene (Surr)	94		56 - 136
Toluene-d8 (Surr)	102		78 - 122
Dibromofluoromethane (Surr)	98		73 - 120

Lab Sample ID: 240-159556-B-5 MSD
Matrix: Water
Analysis Batch: 512679

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
cis-1,2-Dichloroethene	20	U	200	200		ug/L		100	66 - 128	4	14
trans-1,2-Dichloroethene	20	U	200	205		ug/L		103	56 - 136	3	15
Trichloroethene	20	U	200	176		ug/L		88	61 - 124	1	15
Vinyl chloride	20	U	200	166		ug/L		83	43 - 157	0	24

Surrogate	MSD %Recovery	MSD Qualifier	MSD Limits
1,2-Dichloroethane-d4 (Surr)	102		62 - 137
4-Bromofluorobenzene (Surr)	98		56 - 136
Toluene-d8 (Surr)	100		78 - 122
Dibromofluoromethane (Surr)	92		73 - 120

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

GC/MS VOA

Analysis Batch: 512565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159539-2	MW-202S_110221	Total/NA	Water	8260B	
240-159539-3	MW-202_110221	Total/NA	Water	8260B	
240-159539-4	MW-203S_110221	Total/NA	Water	8260B	
240-159539-5	MW-203_110221	Total/NA	Water	8260B	
MB 240-512565/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512565/4	Lab Control Sample	Total/NA	Water	8260B	
240-159539-5 MS	MW-203_110221	Total/NA	Water	8260B	
240-159539-5 MSD	MW-203_110221	Total/NA	Water	8260B	

Analysis Batch: 512679

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159539-1	TRIP BLANK_16	Total/NA	Water	8260B	
MB 240-512679/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512679/4	Lab Control Sample	Total/NA	Water	8260B	
240-159556-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159556-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: TRIP BLANK_16

Lab Sample ID: 240-159539-1

Date Collected: 11/02/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512679	11/12/21 16:45	LEE	TAL CAN

Client Sample ID: MW-202S_110221

Lab Sample ID: 240-159539-2

Date Collected: 11/02/21 12:31

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 06:31	LEE	TAL CAN

Client Sample ID: MW-202_110221

Lab Sample ID: 240-159539-3

Date Collected: 11/02/21 13:46

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 06:53	LEE	TAL CAN

Client Sample ID: MW-203S_110221

Lab Sample ID: 240-159539-4

Date Collected: 11/02/21 18:16

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 07:16	LEE	TAL CAN

Client Sample ID: MW-203_110221

Lab Sample ID: 240-159539-5

Date Collected: 11/02/21 19:16

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		25	512565	11/12/21 07:38	LEE	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 - Off-Site

Job ID: 240-159539-1

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	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

Client Contact: Arcadis
Address: 28550 Cabot Drive, Suite 500
City/State/Zip: Novi, MI, 48377
Phone: 248-994-2240
Project Name: Ford LTP OIE-Site
Project Number: 30080642.402.04
PO # 30080642.402.04

Client Project Manager: Kris Hinskey
Telephone: 248-994-2240
Email: kristoffer.hinskey@arcadis.com

Site Contact: Julia McClafferty
Telephone: 734-644-5131

Lab Contact: Mike DelMonico
Telephone: 330-497-9396

Analysis Turnaround Time: 10 day
FAT if different from below: 3 weeks 2 weeks 1 week 2 days 1 day

Sampler Name: Gary Schaefer
Method of Shipment/Carrier:
Shipping/Tracking No:

Filtered Sample (Y/N) Composite=C / Grab=G

Containers & Preservatives: H2SO4 HNO3 HCl NaOH KOH Other:

Matrix: Air Aqueous Sediment Solid Other:

Sample Date Sample Time

Analyses: 1,4-DCE 8260B Cis-1,2-DCE 8260B Trans-1,2-DCE 8260B PCE 8260B TCE 8260B Vinyl Chloride 8260B 1,4-Dioxane 8260B SIM

Sample Specific Notes / Special Instructions:

1 Trip Blank
3 VOAs for 8260B
3 VOAs for 8260B SIM

1 of 1 COCs
For lab use only

Walk-in client
Lab sampling
Job/SDG No:

240-159539 Chain of Custody

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return to Client Disposal By Lab Archive For _____ Months

Possible Hazard Identification: Non-Hazard Flammable Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by: Gary Schaefer
Relinquished by: [Signature]
Relinquished by: [Signature]

Company: Arcadis
Company: ARCADIS
Company: ETA

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159539

Client ARCADIS Site Name _____

Cooler unpacked by:
Matthew Swana

Cooler Received on 11/6/21 Opened on 11/6/21

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-14 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C
 IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
 -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No NA
 -Were tamper/custody seals intact and uncompromised? Yes No NA

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

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 (ID/Date/Time) be reconciled with the COC? Yes No
 9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? Yes No
 10. Were correct bottle(s) used for the test(s) indicated? Yes No
 11. Sufficient quantity received to perform indicated analyses? Yes No
 12. Are these work share samples and all listed on the COC? Yes No

If yes, Questions 13-17 have been checked at the originating laboratory.
 13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC157842
 14. Were VOAs on the COC? Yes No
 15. Were air bubbles >6 mm in any VOA vials? Yes No NA **●** ← Larger than this.
 16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 01042016 Yes No
 17. Was a LL Hg or Me Hg trip blank present? Yes No

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

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page

Samples processed by: [Signature]

19. 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)

20. 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: _____



DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159539-1
Sample date: 2021-11-02
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:5
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MSD - MS and MSD recovery outliers or one recovery and the MS/MSD RPD were outliers with the recovery biased LOW for these analytes. Results for the client sample spiked only should be considered to be estimated and qualified with a J flag if detected and UJ flags if non-detect for these analytes:
GCMS VOC sample -005 - TRICHLOROETHYLENE - J flag.

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

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

Qualifiers added during verification have been added to the electronic data which is available for download from the CADENA CLMS. Refer to the attached table of analytical results that have been qualified during verification.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at <http://clms.cadenaco.com/index.cfm>.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 159539-1

Sample Name: MW-203_110221

Lab Sample ID: 2401595395

Sample Date: 11/2/2021

Analyte	Cas No.	Result	Report		Units	Valid Qualifier
			Limit			
GC/MS VOC						
<u>OSW-8260B</u>						
Trichloroethene	79-01-6	830	25	ug/l	J	

Analytical Results Summary

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 159539-1

Sample Name:	TRIP BLANK_16	MW-202S_110221	MW-202_110221	MW-203S_110221	MW-203_110221
Lab Sample ID:	2401595391	2401595392	2401595393	2401595394	2401595395
Sample Date:	11/2/2021	11/2/2021	11/2/2021	11/2/2021	11/2/2021

Analyte	Cas No.	TRIP BLANK_16				MW-202S_110221				MW-202_110221				MW-203S_110221				MW-203_110221			
		Result	Limit	Units	Valid	Result	Limit	Units	Valid	Result	Limit	Units	Valid	Result	Limit	Units	Valid	Result	Limit	Units	Valid
GC/MS VOC																					
<u>OSW-8260B</u>																					
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	43	25	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	0.82	1.0	ug/l	J	86	25	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	0.52	1.0	ug/l	J	ND	1.0	ug/l	---	18	1.0	ug/l	---	830	25	ug/l	J
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	25	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG # 240-159539-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:


TestAmerica

North Canton, Ohio

Report # 43581R

Review Level: Tier III

Project: 30080642.402.04

A large, solid orange geometric shape, resembling a right-angled triangle or a trapezoid, is positioned in the bottom right corner of the page. It is oriented with its hypotenuse facing upwards and to the right. A thin white diagonal line runs from the bottom-left corner of this shape towards the top-right corner. A thin white horizontal line crosses the page, passing through the shape.

DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159539-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK_16	240-159539-1	Water	11/02/21		X
MW-202S_110221	240-159539-2	Water	11/02/21		X
MW-202_110221	240-159539-3	Water	11/02/21		X
MW-203S_110221	240-159539-4	Water	11/02/21		X
MW-203_110221	240-159539-5	Water	11/02/21		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
 - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
 - J+ The result is an estimated quantity, but the result may be biased high.
 - J- The result is an estimated quantity, but the result may be biased low.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

DATA REVIEW

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation


%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

DATA REVIEW


**NO CORRECTIONS/QUALIFIERS ADDED
TO SAMPLE ANALYSIS DATA SHEETS**

**CHAIN OF CUSTODY
CORRECTED SAMPLE ANALYSIS DATA
SHEETS**



Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Client Contact		Regulatory program: <input type="checkbox"/> DW <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> Other										TestAmerica Laboratories, Inc.																	
Company Name: Arcadis		Client Project Manager: Kris Hinskey				Site Contact: Julia McClafferty				Lab Contact: Mike DelMonico				COC No:															
Address: 28550 Cabot Drive, Suite 500		Telephone: 248-994-2240				Telephone: 734-644-5131				Telephone: 330-497-9396				1 of 1 COCs															
City/State/Zip: Novi, MI, 48377		Email: kristoffer.hinskey@arcadis.com				Analysis Turnaround Time				Analyses				For lab use only															
Phone: 248-994-2240		Sampler Name: Gary Schaefer				TAT if different from below 10 day				<input type="checkbox"/> 3 weeks <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day				Walk-in client															
Project Name: Ford LTP Off-Site		Method of Shipment/Carrier:				Filtered Sample (Y/N)								Lab sampling															
Project Number: 30080642.402.04		Shipping/Tracking No:				Composite=C / Grab=G				<input checked="" type="checkbox"/> 1,1-DCE 8260B <input checked="" type="checkbox"/> cis-1,2-DCE 8260B <input checked="" type="checkbox"/> Trans-1,2-DCE 8260B <input checked="" type="checkbox"/> PCE 8260B <input checked="" type="checkbox"/> TCE 8260B <input checked="" type="checkbox"/> Vinyl Chloride 8260B <input checked="" type="checkbox"/> 1,4-Dioxane 8260B SIM				Job/SDG No:															
PO # 30080642.402.04		Sample Identification		Sample Date	Sample Time	Matrix					Containers & Preservatives					Sample Specific Notes / Special Instructions:													
		Air	Aqueous	Sediment	Solid	Other:	H2SO4	HNO3	HCl	NaOH	ZnAc	NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM						
TRIP BLANK_16			X						1						NG		X	X	X	X	X			1 Trip Blank					
MW-2025-110221			X						3						NG		X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM					
MW-202-110221			X						3						NG		X	X	X	X				I					
MW-2035-110221			X						3						NG		X	X	X	X									
MW-203-110221			X						3						NG		X	X	X	X									
		 240-159539 Chain of Custody																											
Possible Hazard Identification		<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown										Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months													
Special Instructions/QC Requirements & Comments:																													
Submit all results through Cadena at jtomalla@cadenaco.com, Cadena #E203631 Level IV Reporting requested.																													
Relinquished by: Gary Schaefer		Company: Arcadis		Date/Time: 11/04/21 1558		Received by: Novi cold storage		Company: Arcadis		Date/Time: 11/04/21 1558		Relinquished by: [Signature]		Company: ARCADIS		Date/Time: 11/5/21 1435		Received by: Jeni Hale		Company: ETA		Date/Time: 11/5/21 1435		Relinquished by: Jeni Hale		Company: ETA		Date/Time: 11/6/21 8:00	

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Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: TRIP BLANK_16

Lab Sample ID: 240-159539-1

Date Collected: 11/02/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 16:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 16:45	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 16:45	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 16:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	126		62 - 137		11/12/21 16:45	1
4-Bromofluorobenzene (Surr)	66		56 - 136		11/12/21 16:45	1
Toluene-d8 (Surr)	87		78 - 122		11/12/21 16:45	1
Dibromofluoromethane (Surr)	111		73 - 120		11/12/21 16:45	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-202S_110221

Lab Sample ID: 240-159539-2

Date Collected: 11/02/21 12:31

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 06:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 06:31	1
Trichloroethene	0.52	J	1.0	0.44	ug/L			11/12/21 06:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 06:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		62 - 137		11/12/21 06:31	1
4-Bromofluorobenzene (Surr)	69		56 - 136		11/12/21 06:31	1
Toluene-d8 (Surr)	104		78 - 122		11/12/21 06:31	1
Dibromofluoromethane (Surr)	92		73 - 120		11/12/21 06:31	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-202_110221

Lab Sample ID: 240-159539-3

Date Collected: 11/02/21 13:46

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 06:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 06:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 06:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 06:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		62 - 137		11/12/21 06:53	1
4-Bromofluorobenzene (Surr)	75		56 - 136		11/12/21 06:53	1
Toluene-d8 (Surr)	106		78 - 122		11/12/21 06:53	1
Dibromofluoromethane (Surr)	96		73 - 120		11/12/21 06:53	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-203S_110221

Lab Sample ID: 240-159539-4

Date Collected: 11/02/21 18:16

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 07:16	1
trans-1,2-Dichloroethene	0.82	J	1.0	0.51	ug/L			11/12/21 07:16	1
Trichloroethene	18		1.0	0.44	ug/L			11/12/21 07:16	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 07:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		62 - 137		11/12/21 07:16	1
4-Bromofluorobenzene (Surr)	77		56 - 136		11/12/21 07:16	1
Toluene-d8 (Surr)	113		78 - 122		11/12/21 07:16	1
Dibromofluoromethane (Surr)	97		73 - 120		11/12/21 07:16	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-203_110221

Lab Sample ID: 240-159539-5

Date Collected: 11/02/21 19:16

Matrix: Water

Date Received: 11/06/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	43		25	12	ug/L			11/12/21 07:38	25
trans-1,2-Dichloroethene	86		25	13	ug/L			11/12/21 07:38	25
Trichloroethene	830	F4 J	25	11	ug/L			11/12/21 07:38	25
Vinyl chloride	25	U	25	11	ug/L			11/12/21 07:38	25

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	90		62 - 137		11/12/21 07:38	25
4-Bromofluorobenzene (Surr)	73		56 - 136		11/12/21 07:38	25
Toluene-d8 (Surr)	103		78 - 122		11/12/21 07:38	25
Dibromofluoromethane (Surr)	91		73 - 120		11/12/21 07:38	25

ANALYTICAL REPORT

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

Laboratory Job ID: 240-159138-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey



Authorized for release by:
11/17/2021 10:51:19 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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

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



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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery 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.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Job ID: 240-159138-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159138-1

Comments

No additional comments.

Receipt

The samples were received on 11/3/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.2° C.

GC/MS VOA

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

VOA Prep

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

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Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Method	Method Description	Protocol	Laboratory
8260B	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 - Off-Site

Job ID: 240-159138-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159138-1	TRIP BLANK_15	Water	11/01/21 00:00	11/03/21 08:00
240-159138-2	MW-204S_110121	Water	11/01/21 12:21	11/03/21 08:00
240-159138-3	MW-204_110121	Water	11/01/21 13:26	11/03/21 08:00
240-159138-4	MW-205S_110121	Water	11/01/21 15:36	11/03/21 08:00
240-159138-5	MW-205_110121	Water	11/01/21 16:56	11/03/21 08:00

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- 12
- 13
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Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: TRIP BLANK_15

Lab Sample ID: 240-159138-1

No Detections.

Client Sample ID: MW-204S_110121

Lab Sample ID: 240-159138-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	2.7		1.0	0.46	ug/L	1		8260B	Total/NA
Trichloroethene	7.4		1.0	0.44	ug/L	1		8260B	Total/NA

Client Sample ID: MW-204_110121

Lab Sample ID: 240-159138-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	51		2.5	1.1	ug/L	2.5		8260B	Total/NA

Client Sample ID: MW-205S_110121

Lab Sample ID: 240-159138-4

No Detections.

Client Sample ID: MW-205_110121

Lab Sample ID: 240-159138-5

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 - Off-Site

Job ID: 240-159138-1

Client Sample ID: TRIP BLANK_15

Lab Sample ID: 240-159138-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/03/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		62 - 137		11/11/21 04:04	1
4-Bromofluorobenzene (Surr)	85		56 - 136		11/11/21 04:04	1
Toluene-d8 (Surr)	110		78 - 122		11/11/21 04:04	1
Dibromofluoromethane (Surr)	94		73 - 120		11/11/21 04:04	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-204S_110121

Lab Sample ID: 240-159138-2

Date Collected: 11/01/21 12:21

Matrix: Water

Date Received: 11/03/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	2.7		1.0	0.46	ug/L			11/12/21 12:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 12:20	1
Trichloroethene	7.4		1.0	0.44	ug/L			11/12/21 12:20	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 12:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		62 - 137		11/12/21 12:20	1
4-Bromofluorobenzene (Surr)	77		56 - 136		11/12/21 12:20	1
Toluene-d8 (Surr)	105		78 - 122		11/12/21 12:20	1
Dibromofluoromethane (Surr)	92		73 - 120		11/12/21 12:20	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-204_110121

Lab Sample ID: 240-159138-3

Date Collected: 11/01/21 13:26

Matrix: Water

Date Received: 11/03/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	2.5	U	2.5	1.2	ug/L			11/11/21 19:22	2.5
trans-1,2-Dichloroethene	2.5	U	2.5	1.3	ug/L			11/11/21 19:22	2.5
Trichloroethene	51		2.5	1.1	ug/L			11/11/21 19:22	2.5
Vinyl chloride	2.5	U	2.5	1.1	ug/L			11/11/21 19:22	2.5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		62 - 137		11/11/21 19:22	2.5
4-Bromofluorobenzene (Surr)	75		56 - 136		11/11/21 19:22	2.5
Toluene-d8 (Surr)	104		78 - 122		11/11/21 19:22	2.5
Dibromofluoromethane (Surr)	95		73 - 120		11/11/21 19:22	2.5



Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-205S_110121

Lab Sample ID: 240-159138-4

Date Collected: 11/01/21 15:36

Matrix: Water

Date Received: 11/03/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:26	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:26	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:26	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		62 - 137		11/11/21 04:26	1
4-Bromofluorobenzene (Surr)	78		56 - 136		11/11/21 04:26	1
Toluene-d8 (Surr)	105		78 - 122		11/11/21 04:26	1
Dibromofluoromethane (Surr)	96		73 - 120		11/11/21 04:26	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-205_110121

Lab Sample ID: 240-159138-5

Date Collected: 11/01/21 16:56

Matrix: Water

Date Received: 11/03/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		62 - 137		11/11/21 04:48	1
4-Bromofluorobenzene (Surr)	78		56 - 136		11/11/21 04:48	1
Toluene-d8 (Surr)	102		78 - 122		11/11/21 04:48	1
Dibromofluoromethane (Surr)	90		73 - 120		11/11/21 04:48	1



Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA	BFB	TOL	DBFM
		(62-137)	(56-136)	(78-122)	(73-120)
240-159138-1	TRIP BLANK_15	96	85	110	94
240-159138-2	MW-204S_110121	93	77	105	92
240-159138-3	MW-204_110121	93	75	104	95
240-159138-4	MW-205S_110121	96	78	105	96
240-159138-5	MW-205_110121	91	78	102	90
240-159143-E-3 MSD	Matrix Spike Duplicate	94	97	117	95
240-159143-H-3 MS	Matrix Spike	90	88	108	92
240-159185-C-26 MS	Matrix Spike	89	83	111	87
240-159185-C-26 MSD	Matrix Spike Duplicate	92	90	109	90
240-159556-B-7 MS	Matrix Spike	92	88	106	91
240-159556-B-7 MSD	Matrix Spike Duplicate	90	84	109	93
LCS 240-512327/4	Lab Control Sample	88	84	107	90
LCS 240-512497/4	Lab Control Sample	93	93	113	95
LCS 240-512676/4	Lab Control Sample	94	90	112	95
MB 240-512327/6	Method Blank	92	78	103	91
MB 240-512497/6	Method Blank	94	82	109	92
MB 240-512676/6	Method Blank	97	83	111	96

Surrogate Legend

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

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

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

Lab Sample ID: MB 240-512327/6
Matrix: Water
Analysis Batch: 512327

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
cis-1,2-Dichloroethene	0.541	J	1.0	0.46	ug/L			11/10/21 23:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/10/21 23:58	1
Trichloroethene	0.468	J	1.0	0.44	ug/L			11/10/21 23:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/10/21 23:58	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	92		62 - 137		11/10/21 23:58	1
4-Bromofluorobenzene (Surr)	78		56 - 136		11/10/21 23:58	1
Toluene-d8 (Surr)	103		78 - 122		11/10/21 23:58	1
Dibromofluoromethane (Surr)	91		73 - 120		11/10/21 23:58	1

Lab Sample ID: LCS 240-512327/4
Matrix: Water
Analysis Batch: 512327

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
trans-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Trichloroethene	10.0	9.37		ug/L		94	70 - 122
Vinyl chloride	10.0	8.92		ug/L		89	60 - 144

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	88		62 - 137
4-Bromofluorobenzene (Surr)	84		56 - 136
Toluene-d8 (Surr)	107		78 - 122
Dibromofluoromethane (Surr)	90		73 - 120

Lab Sample ID: 240-159143-E-3 MSD
Matrix: Water
Analysis Batch: 512327

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

Analyte	Sample		Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
	Result	Qualifier									
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128	4	14
trans-1,2-Dichloroethene	1.0	U	10.0	9.34		ug/L		93	56 - 136	4	15
Trichloroethene	1.0	U	10.0	7.92		ug/L		79	61 - 124	6	15
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	43 - 157	6	24

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	94		62 - 137
4-Bromofluorobenzene (Surr)	97		56 - 136
Toluene-d8 (Surr)	117		78 - 122
Dibromofluoromethane (Surr)	95		73 - 120

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

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

Lab Sample ID: 240-159143-H-3 MS
Matrix: Water
Analysis Batch: 512327

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
cis-1,2-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	66 - 128
trans-1,2-Dichloroethene	1.0	U	10.0	8.94		ug/L		89	56 - 136
Trichloroethene	1.0	U	10.0	7.46		ug/L		75	61 - 124
Vinyl chloride	1.0	U	10.0	9.56		ug/L		96	43 - 157

Surrogate	MS %Recovery	MS Qualifier	MS Limits
1,2-Dichloroethane-d4 (Surr)	90		62 - 137
4-Bromofluorobenzene (Surr)	88		56 - 136
Toluene-d8 (Surr)	108		78 - 122
Dibromofluoromethane (Surr)	92		73 - 120

Lab Sample ID: MB 240-512497/6
Matrix: Water
Analysis Batch: 512497

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 12:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 12:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 12:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 12:17	1

Surrogate	MB %Recovery	MB Qualifier	MB Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	94		62 - 137		11/11/21 12:17	1
4-Bromofluorobenzene (Surr)	82		56 - 136		11/11/21 12:17	1
Toluene-d8 (Surr)	109		78 - 122		11/11/21 12:17	1
Dibromofluoromethane (Surr)	92		73 - 120		11/11/21 12:17	1

Lab Sample ID: LCS 240-512497/4
Matrix: Water
Analysis Batch: 512497

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	10.0	11.1		ug/L		111	77 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.47		ug/L		95	70 - 122
Vinyl chloride	10.0	10.1		ug/L		101	60 - 144

Surrogate	LCS %Recovery	LCS Qualifier	LCS Limits
1,2-Dichloroethane-d4 (Surr)	93		62 - 137
4-Bromofluorobenzene (Surr)	93		56 - 136
Toluene-d8 (Surr)	113		78 - 122
Dibromofluoromethane (Surr)	95		73 - 120

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

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

Lab Sample ID: 240-159185-C-26 MS
Matrix: Water
Analysis Batch: 512497

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
cis-1,2-Dichloroethene	7100		3330	9520		ug/L		72	66 - 128
trans-1,2-Dichloroethene	330	U	3330	2870		ug/L		86	56 - 136
Trichloroethene	8300	F1	3330	10000	F1	ug/L		51	61 - 124
Vinyl chloride	330	U	3330	2880		ug/L		86	43 - 157

Surrogate	MS %Recovery	MS Qualifier	MS Limits
1,2-Dichloroethane-d4 (Surr)	89		62 - 137
4-Bromofluorobenzene (Surr)	83		56 - 136
Toluene-d8 (Surr)	111		78 - 122
Dibromofluoromethane (Surr)	87		73 - 120

Lab Sample ID: 240-159185-C-26 MSD
Matrix: Water
Analysis Batch: 512497

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
cis-1,2-Dichloroethene	7100		3330	10100		ug/L		90	66 - 128	6	14
trans-1,2-Dichloroethene	330	U	3330	3270		ug/L		98	56 - 136	13	15
Trichloroethene	8300	F1	3330	10700		ug/L		71	61 - 124	6	15
Vinyl chloride	330	U	3330	3410		ug/L		102	43 - 157	17	24

Surrogate	MSD %Recovery	MSD Qualifier	MSD Limits
1,2-Dichloroethane-d4 (Surr)	92		62 - 137
4-Bromofluorobenzene (Surr)	90		56 - 136
Toluene-d8 (Surr)	109		78 - 122
Dibromofluoromethane (Surr)	90		73 - 120

Lab Sample ID: MB 240-512676/6
Matrix: Water
Analysis Batch: 512676

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 11:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 11:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 11:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 11:58	1

Surrogate	MB %Recovery	MB Qualifier	MB Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		62 - 137		11/12/21 11:58	1
4-Bromofluorobenzene (Surr)	83		56 - 136		11/12/21 11:58	1
Toluene-d8 (Surr)	111		78 - 122		11/12/21 11:58	1
Dibromofluoromethane (Surr)	96		73 - 120		11/12/21 11:58	1

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

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

Lab Sample ID: LCS 240-512676/4
Matrix: Water
Analysis Batch: 512676

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	75 - 124
Trichloroethene	10.0	9.00		ug/L		90	70 - 122
Vinyl chloride	10.0	10.0		ug/L		100	60 - 144

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	94		62 - 137
4-Bromofluorobenzene (Surr)	90		56 - 136
Toluene-d8 (Surr)	112		78 - 122
Dibromofluoromethane (Surr)	95		73 - 120

Lab Sample ID: 240-159556-B-7 MS
Matrix: Water
Analysis Batch: 512676

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
cis-1,2-Dichloroethene	10	U	100	94.5		ug/L		94	66 - 128
trans-1,2-Dichloroethene	10	U	100	95.2		ug/L		95	56 - 136
Trichloroethene	10	U	100	78.2		ug/L		78	61 - 124
Vinyl chloride	10	U	100	89.4		ug/L		89	43 - 157

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	92		62 - 137
4-Bromofluorobenzene (Surr)	88		56 - 136
Toluene-d8 (Surr)	106		78 - 122
Dibromofluoromethane (Surr)	91		73 - 120

Lab Sample ID: 240-159556-B-7 MSD
Matrix: Water
Analysis Batch: 512676

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
cis-1,2-Dichloroethene	10	U	100	102		ug/L		102	66 - 128	8	14
trans-1,2-Dichloroethene	10	U	100	103		ug/L		103	56 - 136	8	15
Trichloroethene	10	U	100	87.1		ug/L		87	61 - 124	11	15
Vinyl chloride	10	U	100	103		ug/L		103	43 - 157	15	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		62 - 137
4-Bromofluorobenzene (Surr)	84		56 - 136
Toluene-d8 (Surr)	109		78 - 122
Dibromofluoromethane (Surr)	93		73 - 120

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

GC/MS VOA

Analysis Batch: 512327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159138-1	TRIP BLANK_15	Total/NA	Water	8260B	
240-159138-4	MW-205S_110121	Total/NA	Water	8260B	
240-159138-5	MW-205_110121	Total/NA	Water	8260B	
MB 240-512327/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512327/4	Lab Control Sample	Total/NA	Water	8260B	
240-159143-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159143-H-3 MS	Matrix Spike	Total/NA	Water	8260B	

Analysis Batch: 512497

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159138-3	MW-204_110121	Total/NA	Water	8260B	
MB 240-512497/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512497/4	Lab Control Sample	Total/NA	Water	8260B	
240-159185-C-26 MS	Matrix Spike	Total/NA	Water	8260B	
240-159185-C-26 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 512676

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159138-2	MW-204S_110121	Total/NA	Water	8260B	
MB 240-512676/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512676/4	Lab Control Sample	Total/NA	Water	8260B	
240-159556-B-7 MS	Matrix Spike	Total/NA	Water	8260B	
240-159556-B-7 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: TRIP BLANK_15

Lab Sample ID: 240-159138-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 04:04	LEE	TAL CAN

Client Sample ID: MW-204S_110121

Lab Sample ID: 240-159138-2

Date Collected: 11/01/21 12:21

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512676	11/12/21 12:20	LEE	TAL CAN

Client Sample ID: MW-204_110121

Lab Sample ID: 240-159138-3

Date Collected: 11/01/21 13:26

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		2.5	512497	11/11/21 19:22	LEE	TAL CAN

Client Sample ID: MW-205S_110121

Lab Sample ID: 240-159138-4

Date Collected: 11/01/21 15:36

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 04:26	LEE	TAL CAN

Client Sample ID: MW-205_110121

Lab Sample ID: 240-159138-5

Date Collected: 11/01/21 16:56

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 04:48	LEE	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 - Off-Site

Job ID: 240-159138-1

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	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21


**Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility**

Login # : 159138

Client ARCADIS Site Name _____ Cooler unpacked by Matthew Suma
 Cooler Received on 11/3/21 Opened on 11/3/21
 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-14 (CF +0.1 °C) Observed Cooler Temp 0 1 °C Corrected Cooler Temp 0 2 °C
 IR GUN #IR-15 (CF +0.2 °C) Observed Cooler Temp _____ °C Corrected Cooler Temp _____ °C
- 2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
 Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
 -Were tamper/custody seals intact and uncompromised? Yes No NA
- 3 Shippers' packing slip attached to the cooler(s)? Yes No
 4 Did custody papers accompany the sample(s)? Yes No
 5 Were the custody papers relinquished & signed in the appropriate place? Yes No
 6 Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
 7 Did all bottles arrive in good condition (Unbroken)? Yes No
 8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
 9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
 10 Were correct bottle(s) used for the test(s) indicated? Yes No
 11 Sufficient quantity received to perform indicated analyses? Yes No
 12 Are these work share samples and all listed on the COC? Yes No
 If yes, Questions 13-17 have been checked at the originating laboratory
- 13 Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC157842
 14 Were VOAs on the COC? Yes No
 15 Were air bubbles >6 mm in any VOA vials?  Larger than this. Yes No NA
 16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 01042016 Yes No
 17 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 _____

18 CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page Samples processed by _____

19 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)

20 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 _____

DATA VERIFICATION REPORT



November 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631

Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater

Project number: 30080642.402.04 WA03 OFF-SITE GW

Event Specific Scope of Work References: Sample COC

Laboratory: TestAmerica - North Canton

Laboratory submittal: 159138-1

Sample date: 2021-11-01

Report received by CADENA: 2021-11-17

Initial Data Verification completed by CADENA: 2021-11-17

Number of Samples:5

Sample Matrices:Water

Test Categories:GCMS VOC

Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 512327 method blank had detections below the RL for the following analytes: CIS-1,2-DICHLOROETHENE and TRICHLOROETHENE. Qualification of client sample results was not required based on these method blank detections.

GCMS QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

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

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at <http://clms.cadenaco.com/index.cfm>.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 159138-1

Sample Name:	TRIP BLANK_15	MW-204S_110121	MW-204_110121	MW-205S_110121	MW-205_110121
Lab Sample ID:	2401591381	2401591382	2401591383	2401591384	2401591385
Sample Date:	11/1/2021	11/1/2021	11/1/2021	11/1/2021	11/1/2021

Analyte	Cas No.	TRIP BLANK_15				MW-204S_110121				MW-204_110121				MW-205S_110121				MW-205_110121			
		Result	Limit	Units	Valid	Result	Limit	Units	Valid	Result	Limit	Units	Valid	Result	Limit	Units	Valid	Result	Limit	Units	Valid
GC/MS VOC																					
<u>OSW-8260B</u>																					
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	2.7	1.0	ug/l	---	ND	2.5	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	2.5	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	7.4	1.0	ug/l	---	51	2.5	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	2.5	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG # 240-159138-1

CADENA Verification Report: 2021-11-17

Analyses Performed By:


TestAmerica

North Canton, Ohio

Report # 43557R

Review Level: Tier III

Project: 30080642.402.04



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159138-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK_15	240-159138-1	Water	11/01/2021		X
MW-204S_110121	240-159138-2	Water	11/01/2021		X
MW-204_110121	240-159138-3	Water	11/01/2021		X
MW-205S_110121	240-159138-4	Water	11/01/2021		X
MW-205_110121	240-159138-5	Water	11/01/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
 - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
 - J+ The result is an estimated quantity, but the result may be biased high.
 - J- The result is an estimated quantity, but the result may be biased low.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation


%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 02, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 2, 2021

**NO CORRECTIONS/QUALIFIERS ADDED
TO SAMPLE ANALYSIS DATA SHEETS**

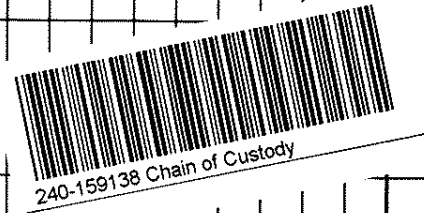


**CHAIN OF CUSTODY
CORRECTED SAMPLE ANALYSIS DATA
SHEETS**



TestAmerica Laboratory location Brighton 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Client Contact		Regulatory program		DW		NPDES		RCRA		Other													
Company Name: Arcadis		Client Project Manager: Kris Hinskey				Site Contact: Julia McClafferty				Lab Contact: Mike DelMonico		TestAmerica Laboratories, Inc.											
Address: 28550 Cabot Drive, Suite 500		Telephone: 248-994-2240				Telephone: 734-644-5131				Telephone: 330-497-9396		COC No:											
City/State/Zip: Novi, MI, 48377		Email: kristoffer.hinskey@arcadis.com				Analysis Turnaround Time				Analyses		1 of 1 COCs											
Phone: 248-994-2240		Sampler Name: Gary Schafel				TAT if different from below				For lab use only		Walk-in client											
Project Name: Ford LTP Off-Site		Method of Shipment/Carrier:				10 day				1 week		Lab sampling											
Project Number: 30080642.402.04		Shipping/Tracking No:				2 days				2 days		Job/SDG No:											
PO # 30080642.402.04						1 day																	
Sample Identification	Sample Date	Sample Time	Matrix					Containers & Preservatives					Filtered Sample (Y/N)	Composite=C / Grab=G	1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:	
			Air	Aqueous	Sediment	Solid	Other	MDS04	MNO3	HCl	NaOH	ZnAc											NaOH
TRIP BLANK_ 15			X					1						NG	X	X	X	X	X	X			1 Trip Blank
MW-2045-11/01/21	11/01/21	12:21	X					3						NG	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM	
MW-204-11/01/21	11/01/21	13:26	X					3						NG	X	X	X	X					
MW-2055-11/01/21	11/01/21	15:36	X					3						NG	X	X	X	X					
MW-205-11/01/21	11/01/21	16:56	X					3						NG	X	X	X	X					



Page 21 of 22

11/17/2021

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Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: TRIP BLANK_15

Lab Sample ID: 240-159138-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/03/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		62 - 137		11/11/21 04:04	1
4-Bromofluorobenzene (Surr)	85		56 - 136		11/11/21 04:04	1
Toluene-d8 (Surr)	110		78 - 122		11/11/21 04:04	1
Dibromofluoromethane (Surr)	94		73 - 120		11/11/21 04:04	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-204S_110121

Lab Sample ID: 240-159138-2

Date Collected: 11/01/21 12:21

Matrix: Water

Date Received: 11/03/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	2.7		1.0	0.46	ug/L			11/12/21 12:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 12:20	1
Trichloroethene	7.4		1.0	0.44	ug/L			11/12/21 12:20	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 12:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		62 - 137		11/12/21 12:20	1
4-Bromofluorobenzene (Surr)	77		56 - 136		11/12/21 12:20	1
Toluene-d8 (Surr)	105		78 - 122		11/12/21 12:20	1
Dibromofluoromethane (Surr)	92		73 - 120		11/12/21 12:20	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-204_110121

Lab Sample ID: 240-159138-3

Date Collected: 11/01/21 13:26

Matrix: Water

Date Received: 11/03/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	2.5	U	2.5	1.2	ug/L			11/11/21 19:22	2.5
trans-1,2-Dichloroethene	2.5	U	2.5	1.3	ug/L			11/11/21 19:22	2.5
Trichloroethene	51		2.5	1.1	ug/L			11/11/21 19:22	2.5
Vinyl chloride	2.5	U	2.5	1.1	ug/L			11/11/21 19:22	2.5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		62 - 137		11/11/21 19:22	2.5
4-Bromofluorobenzene (Surr)	75		56 - 136		11/11/21 19:22	2.5
Toluene-d8 (Surr)	104		78 - 122		11/11/21 19:22	2.5
Dibromofluoromethane (Surr)	95		73 - 120		11/11/21 19:22	2.5

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-205S_110121

Lab Sample ID: 240-159138-4

Date Collected: 11/01/21 15:36

Matrix: Water

Date Received: 11/03/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:26	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:26	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:26	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		62 - 137		11/11/21 04:26	1
4-Bromofluorobenzene (Surr)	78		56 - 136		11/11/21 04:26	1
Toluene-d8 (Surr)	105		78 - 122		11/11/21 04:26	1
Dibromofluoromethane (Surr)	96		73 - 120		11/11/21 04:26	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-205_110121

Lab Sample ID: 240-159138-5

Date Collected: 11/01/21 16:56

Matrix: Water

Date Received: 11/03/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		62 - 137		11/11/21 04:48	1
4-Bromofluorobenzene (Surr)	78		56 - 136		11/11/21 04:48	1
Toluene-d8 (Surr)	102		78 - 122		11/11/21 04:48	1
Dibromofluoromethane (Surr)	90		73 - 120		11/11/21 04:48	1