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Environment Testing America

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ANALYTICAL REPORT

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

Laboratory Job ID: 240-134639-1

Client Project/Site: Ford LTP Off-Site

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

Attn: Kristoffer Hinskey

Mole Del your

Authorized for release by: 8/20/2020 9:46:58 AM

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

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

3

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Qualifiers

GC/MS VOA	
Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Clossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
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

Job ID: 240-134639-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Off-Site

Report Number: 240-134639-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Canton attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 8/7/2020 9:20 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.0° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples TRIP BLANK (240-134639-1) and MW-128S_080420 (240-134639-2) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 08/14/2020.

cis-1,2-Dichloroethene failed the recovery criteria high for LCS 240-447176/4. Refer to the QC report for details.

The laboratory control sample (LCS) for 447176 recovered outside control limits for one or multiple analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported: TRIP BLANK (240-134639-1), MW-128S_080420 (240-134639-2) and (LCS 240-447176/4).

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

VOLATILE ORGANIC COMPOUNDS (GCMS SIM)

Sample MW-128S_080420 (240-134639-2) was analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The sample was analyzed on 08/11/2020.

Job ID: 240-134639-1 (Continued)

Laboratory: Eurofins TestAmerica, Canton (Continued)

An MS/MSD was done in 240-446478 however the sample and the MS/MSD could not be reported. The effected sample is MW-128S_080420 (240-134639-2).

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

Method Summary

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

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

Protocol References:

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

Laboratory References:

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

Eurofins TestAmerica, Canton

Sample Summary

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

Lab Sample ID Client Sample ID	Matrix	Collected	Received	Asset ID
240-134639-1 TRIP BLANK	Water	08/04/20 00:00	08/07/20 09:20	
240-134639-2 MW-128S_080420	Water	08/04/20 11:10	08/07/20 09:20	

Detection	Summary
------------------	---------

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

Client Sample ID: TRIP BLANK

No Detections.

Client Sample ID: MW-128S_080420

No Detections.

Job ID: 240-134639-1

Lab Sample ID: 240-134639-1

Lab Sample ID: 240-134639-2

This Detection Summary does not include radiochemical test results.

Client Sample ID: TRIP BLANK Date Collected: 08/04/20 00:00 Date Received: 08/07/20 09:20

Lab Sample ID: 240-134639-1

Matrix: Water

5 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/14/20 11:29	1
cis-1,2-Dichloroethene	1.0	U *	1.0	0.38	ug/L			08/14/20 11:29	1
Tetrachloroethene	1.0	U	1.0	0.33	ug/L			08/14/20 11:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.43	ug/L			08/14/20 11:29	1
Trichloroethene	1.0	U	1.0	0.36	ug/L			08/14/20 11:29	1
Vinyl chloride	1.0	U	1.0	0.50	ug/L			08/14/20 11:29	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		75 - 130					08/14/20 11:29	1
4-Bromofluorobenzene (Surr)	104		47 - 134					08/14/20 11:29	1
Toluene-d8 (Surr)	106		69 - 122					08/14/20 11:29	1
Dibromofluoromethane (Surr)	123		78 - 129					08/14/20 11:29	1

Tetrachloroethene

Trichloroethene

Toluene-d8 (Surr)

Vinyl chloride

Surrogate

trans-1,2-Dichloroethene

1,2-Dichloroethane-d4 (Surr)

4-Bromofluorobenzene (Surr)

Dibromofluoromethane (Surr)

Client Sample ID: MW-128S_080420 Date Collected: 08/04/20 11:10 Date Received: 08/07/20 09:20

Method: 8260B SIM - Volati	le Organic Co	mpounds	(GC/MS)					
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/11/20 07:01
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed
1,2-Dichloroethane-d4 (Surr)	75		70 - 133			-		08/11/20 07:01
Method: 8260B - Volatile Or	ganic Compo	unds (GC/	MS)					
Analyte	-	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed
1,1-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/14/20 11:51
cis-1,2-Dichloroethene	1.0	U *	1.0	0.38	ug/L			08/14/20 11:51

1.0

1.0

1.0

1.0

Limits

75 - 130

47 - 134

69 - 122

78 - 129

0.33 ug/L

0.43 ug/L

0.36 ug/L

0.50 ug/L

1.0 U

1.0 U

1.0 U

1.0 U

%Recovery Qualifier

99

99

99

115

Lab Sample ID: 240-134639-2 Matrix: Wate

08/14/20 11:51

08/14/20 11:51

08/14/20 11:51

08/14/20 11:51

Analyzed

08/14/20 11:51 08/14/20 11:51

08/14/20 11:51

08/14/20 11:51

Prepared

Water	3
	4
Dil Fac	5
1 Dil Fac	6
1	7
Dil Fac	8
1	9
1	10
1 1	11
Dil Fac 1	12
1 1	13
1	

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Surrogate Summary

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

atrix: Water						Prep Type: Total/NA	
			Pe	ercent Surro	ogate Recover	y (Acceptance Limits)	
		DCA	BFB	TOL	DBFM		
ab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)		5
40-134639-1	TRIP BLANK	102	104	106	123		
40-134639-2	MW-128S_080420	99	99	99	115		
40-134647-C-6 MS	Matrix Spike	103	107	105	125		
40-134647-D-6 MSD	Matrix Spike Duplicate	103	103	105	124		
CS 240-447176/4	Lab Control Sample	102	102	107	123		
IB 240-447176/6	Method Blank	102	103	105	120		8
Surrogate Legend							
DCA = 1,2-Dichloroe	ethane-d4 (Surr)						9
BFB = 4-Bromofluor	obenzene (Surr)						
TOL = Toluene-d8 (S	Surr)						
DBFM = Dibromoflue	promethane (Surr)						
othod: 8260B	SIM - Volatile Organic	Compoun	de (GC)				
		compoun	us (60/	1413)		Bron Type: Total/NA	
atrix: Water						Prep Type: Total/NA	
			Pe	ercent Surro	ogate Recover	y (Acceptance Limits)	
		DCA					13
ab Sample ID	Client Sample ID	(70-133)					

Method: 8260B SIM -

Lab Sample ID

240-134639-1

240-134639-2

240-134647-C-6 MS

LCS 240-447176/4

MB 240-447176/6

240-134647-D-6 MSD

			Percent Surrogate Recovery (Acceptance Limits)	- 2
		DCA		
Lab Sample ID	Client Sample ID	(70-133)		
240-134639-2	MW-128S_080420	75		- 1
LCS 240-446478/4	Lab Control Sample	77		
MB 240-446478/5	Method Blank	79		

Surrogate Legend

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

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

Lab Sample ID: MB 240-447176/6 **Matrix: Water**

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

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analysis Batch: 447176 MB MB Analyte **Result Qualifier** RL MDL Unit Prepared Analyzed Dil Fac D 0.46 ug/L 1,1-Dichloroethene 1.0 U 1.0 08/14/20 09:38 1 cis-1,2-Dichloroethene 1.0 U 1.0 0.38 ug/L 08/14/20 09:38 1 Tetrachloroethene 1.0 U 1.0 0.33 ug/L 08/14/20 09:38 1 trans-1,2-Dichloroethene 1.0 U 1.0 0.43 ug/L 08/14/20 09:38 1 Trichloroethene 0.36 ug/L 1.0 U 1.0 08/14/20 09:38 1 Vinyl chloride 1.0 U 1.0 0.50 ug/L 08/14/20 09:38 1

	IVIB	IVIB				
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		75 - 130		08/14/20 09:38	1
4-Bromofluorobenzene (Surr)	103		47 - 134		08/14/20 09:38	1
Toluene-d8 (Surr)	105		69 - 122		08/14/20 09:38	1
Dibromofluoromethane (Surr)	120		78 - 129		08/14/20 09:38	1

Lab Sample ID: LCS 240-447176/4 **Matrix: Water** Analysis Batch: 447176

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
1,1-Dichloroethene	10.0	12.4		ug/L		124	73 - 129	
cis-1,2-Dichloroethene	10.0	12.5	*	ug/L		125	75 - 124	
Tetrachloroethene	10.0	11.7		ug/L		117	70 - 125	
trans-1,2-Dichloroethene	10.0	12.3		ug/L		123	74 - 130	
Trichloroethene	10.0	11.4		ug/L		114	71 ₋ 121	
Vinyl chloride	10.0	11.8		ug/L		118	61 - 134	

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	102		75 - 130
4-Bromofluorobenzene (Surr)	102		47 - 134
Toluene-d8 (Surr)	107		69 - 122
Dibromofluoromethane (Surr)	123		78 - 129

107

105

Lab Sample ID: 240-134647-C-6 MS **Matrix: Water** Analysis Batch: 447176

4-Bromofluorobenzene (Surr)

Toluene-d8 (Surr)

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
1,1-Dichloroethene	1.0	U	10.0	11.2		ug/L		112	64 - 132	
cis-1,2-Dichloroethene	1.0	U *	10.0	11.7		ug/L		117	68 ₋ 121	
Tetrachloroethene	1.0	U	10.0	9.90		ug/L		99	52 ₋ 129	
trans-1,2-Dichloroethene	1.0	U	10.0	12.0		ug/L		120	69 ₋ 126	
Trichloroethene	1.0	U	10.0	10.8		ug/L		108	56 ₋ 124	
Vinyl chloride	4.7		10.0	16.3		ug/L		115	49 - 136	
	MS	MS								
Surrogate	%Recovery	Qualifier	Limits							
1,2-Dichloroethane-d4 (Surr)	103		75 - 130							

Client Samp	le ID: M	atrix Spil	ke

Prep Type: Total/NA

Eurofins TestAmerica, Canton

10

47 - 134

69 - 122

Lab Sample ID: 240-134647-C-6 MS

Job ID: 240-134639-1

Client Sample ID: Matrix Spike

0 7 8 9 10 11 12

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

Matrix: Water Analysis Batch: 447176										Prep Type: 1		
	MS	MS										
Surrogate	%Recovery	Qualifier	Limits									
Dibromofluoromethane (Surr)	125		78 - 129									
Lab Sample ID: 240-1346	47-D-6 MSD					Clie	ent Sa	ampl	e ID: N	latrix Spike D	uplica	ate
Matrix: Water										Prep Type: 1	otal/	NA
Analysis Batch: 447176												
	Sample 3	Sample	Spike	MSD	MSD					%Rec.	R	RPD
Analyte		Qualifier	Added	Result	Qualif	er Unit		D	%Rec	Limits RF	D Li	imit
1,1-Dichloroethene	1.0	U	10.0	11.7		ug/L			117	64 - 132	4	35
cis-1,2-Dichloroethene	1.0	U *	10.0	11.9		ug/L			119	68 - 121	1	35
Tetrachloroethene	1.0	U	10.0	10.2		ug/L			102	52 - 129	3	35
rans-1,2-Dichloroethene	1.0	U	10.0	11.5		ug/L			115	69 - 126	4	35
Trichloroethene	1.0	U	10.0	10.6		ug/L			106	56 - 124	1	35
Vinyl chloride	4.7		10.0	16.7		ug/L			120	49 - 136	3	35
	MSD	MSD										
Surrogate	%Recovery	Qualifier	Limits									
1,2-Dichloroethane-d4 (Surr)	103		75 - 130									
4-Bromofluorobenzene (Surr)	103		47 - 134									
Toluene-d8 (Surr)	105		69 - 122									
Dibromofluoromethane (Surr)	124		78 - 129									
lethod: 8260B SIM - \	/olatile Org	anic Cor	npounds (GC/MS	S)							
Lab Sample ID: MB 240-4	AC 479/5				-			Clie	nt Som	nio ID: Mothe	d Pla	mk
Lab Sample ID: MB 240-4 Matrix: Water	404/0/3							Cile	ni Jall	ple ID: Metho		
										Prep Type: 1	otal/	NA
Analysis Batch: 446478		МВ МВ										
Analyte	-	sult Qualifier	RL		NDL U	nit	D	Dr	epared	Analyzed	Dil	Fac
1,4-Dioxane					0.86 u			F10	epaieu	-1000000000000000000000000000000000000		1
					- •	-						
	1	MB MB										

Analysis Batch: 446478											
	MB	МВ									
Analyte	Result	Qualifier	RL	r	MDL Un	t	D	Pr	epared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0		0.86 ug	L	·			08/11/20 05:46	1
	MB	MB									
Surrogate	%Recovery	Qualifier	Limits					Pr	epared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	79		70 - 133							08/11/20 05:46	1
Lab Sample ID: LCS 240-4 Matrix: Water	46478/4					C	lient	San	nple ID:	Lab Control S Prep Type: T	
•	46478/4		Spike	LCS	LCS	C	lient	San	nple ID:		
Matrix: Water	46478/4		Spike Added	-	LCS Qualifie		lient	San D	nple ID: %Rec	Prep Type: T	
Matrix: Water Analysis Batch: 446478	46478/4		•	-			lient			Prep Type: T %Rec.	
Matrix: Water Analysis Batch: 446478 Analyte	46478/4		Added	Result		r <u>Unit</u>	lient		%Rec	Prep Type: T %Rec. Limits	
Matrix: Water Analysis Batch: 446478 Analyte			Added	Result		r <u>Unit</u>	lient		%Rec	Prep Type: T %Rec. Limits	

GC/MS VOA

Analysis Batch: 446478

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134639-2	MW-128S_080420	Total/NA	Water	8260B SIM	
MB 240-446478/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-446478/4	Lab Control Sample	Total/NA	Water	8260B SIM	

Analysis Batch: 447176

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134639-1	TRIP BLANK	Total/NA	Water	8260B	
240-134639-2	MW-128S_080420	Total/NA	Water	8260B	
MB 240-447176/6	Method Blank	Total/NA	Water	8260B	
LCS 240-447176/4	Lab Control Sample	Total/NA	Water	8260B	
240-134647-C-6 MS	Matrix Spike	Total/NA	Water	8260B	
240-134647-D-6 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Matrix: Water

Lab Sample ID: 240-134639-1

TAL CAN

TAL CAN

Client Sample ID: TRIP BLANK Date Collected: 08/04/20 00:00 Date Received: 08/07/20 09:20

Analysis

Analysis

8260B

8260B SIM

	Batch	Batch		Dilution	Batch	Prepared			
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	8260B		1	447176	08/14/20 11:29	LEE	TAL CAN	
Client Sam	ple ID: MW	-128S_08042	20				Lab Sa	mple ID:	240-1346
Date Collecte	d: 08/04/20 1	1:10							Matrix: V
Date Receive	d: 08/07/20 0	9:20							
_	Batch	Batch		Dilution	Batch	Prepared			
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	

1

1

447176 08/14/20 11:51 LEE

446478 08/11/20 07:01 SAM

Laboratory References:

Total/NA

Total/NA

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

Eurofins TestAmerica, Canton

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

Job ID: 240-134639-1

Laboratory: Eurofins TestAmerica, Canton

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-20 *
lowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-20
Minnesota	NELAP	OH00048	12-31-20
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-21
West Virginia DEP	State	210	12-31-20

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

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Multi (M. 14.01) Table (M. 14.01)<	ification fifeation oug 2.0 .oug 2.0 .oug 2.0	rhinskey@arcadis.com	Telephone: 734-644-5131		Telephone: 3.	30-497-9396		
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9. SAMPLE PRESERVATION	
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ime preserved: Preservative(s) added/Lot number(s):	(1)
OA Sample Preservation - Date/Time VOAs Frozen:	(1)

WI-NC-099

Login # : 13-1639

Co	oler D	escrip		IR Gun #	Canton Sample Recei	Corrected	Coolant
-	(Cir	cle)		(Circle)	Temp °C	Temp °C	(Circle)
TA	Client	Box	Other	IR-10 IR-11	3.1	4.0	Water None
TA	Client	Box	Other	IR-10 IR-TT	1.2	2.2	Water None
TA	Client	Box	Other	IR-10 IR-TD	1.3	2.2	Wellce Blue ice D Water None
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WI-NC-099 Cooler Receipt Form Page 2 - Multiple Coolers

DATA VERIFICATION REPORT



August 20, 2020

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: 30050315.0402.04 off site Event Specific Scope of Work References: Sample COC Laboratory: TestAmerica - North Canton Laboratory submittal: 134639-1 Sample date: 2020-08-04 Report received by CADENA: 2020-08-20 Initial Data Verification completed by CADENA: 2020-08-20 Number of Samples: 1 Water and 1 trip blank 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:

LCS recoveries were outliers biased HIGH for these tests and analytes (or one LCS and the associated LCS/LCSD RPD). All associated client sample results were non-detect for these analytes so were not affected by the high bias and qualification was not required: GCMS VOC QC batch 447176 - CIS-1,2-DICHLOROETHYLENE.

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 Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
В	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 contaminates) 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.
Е	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 contaminates) 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: 134639-1

		Sample Name: Lab Sample ID: Sample Date:	TRIP BLA 2401346 8/4/202	5391			MW-128 2401346 8/4/202		20	
				Report		Valid		Report		Valid
	Analyte	Cas No.	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier
GC/MS VOC										
<u>OSW-8260</u>	<u>)B</u>									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l		ND	1.0	ug/l	
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l		ND	1.0	ug/l	
	Tetrachloroethene	127-18-4	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	
	Trichloroethene	79-01-6	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	
<u>OSW-8260</u>)BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	



Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG # 240-134639-1 CADENA Verification Report: 2020-08-20

Analyses Performed By: TestAmerica Edison, New Jersey

Report #38044R Review Level: Tier III Project: 30050315.402.02

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-134639-1 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		ļ	Analysis	
SDG	Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	VOC (Full Scan)	VOC (SIM)	MISC
0.40.40.4000.4	TRIP BLANK	240-134639-1	Water	8/4/2020		х		
240-134639-1	MW-128S_080420	240-134639-2	Water	8/4/2020		Х	Х	

ANALYTICAL DATA PACKAGE DOCUMENTATION

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

		Rep	orted		mance ptable	Not
	Items Reviewed	No	Yes	No	Yes	Required
1. San	nple receipt condition		Х		Х	
2. Req	uested analyses and sample results		Х		Х	
3. Mas	ster tracking list		Х		Х	
4. Met	hods of analysis		Х		Х	
5. Rep	porting limits		Х		Х	
6. San	nple collection date		Х		Х	
7. Lab	oratory sample received date		Х		Х	
8. San	nple preservation verification (as applicable)		Х		Х	
9. San	nple preparation/extraction/analysis dates		Х		Х	
10. Fully	y executed Chain-of-Custody (COC) form		Х		Х	
	rative summary of Quality Assurance or sample plems provided		х		Х	
12. Data	a Package Completeness and Compliance		Х		Х	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. 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.

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/8260B-SIM	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.

DATA REVIEW

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 was not performed on a sample within this SDG.

6. Compound Identification

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

No compounds were detected in the samples within this SDG.

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 VALIDATION CHECKLIST FOR VOCs

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

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Joseph C. Houser

SIGNATURE:

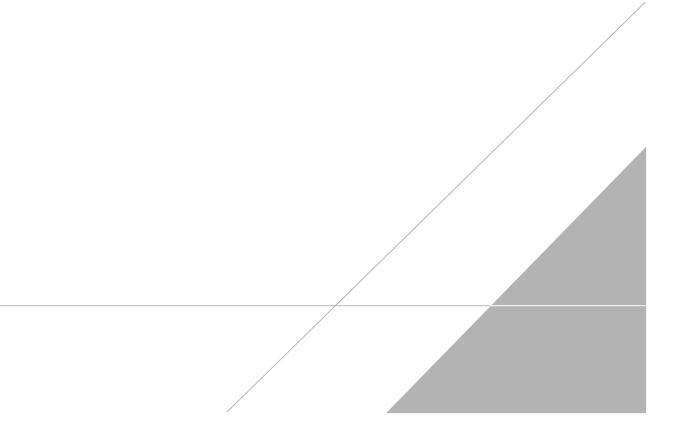
Jough c. House

DATE: August 27, 2020

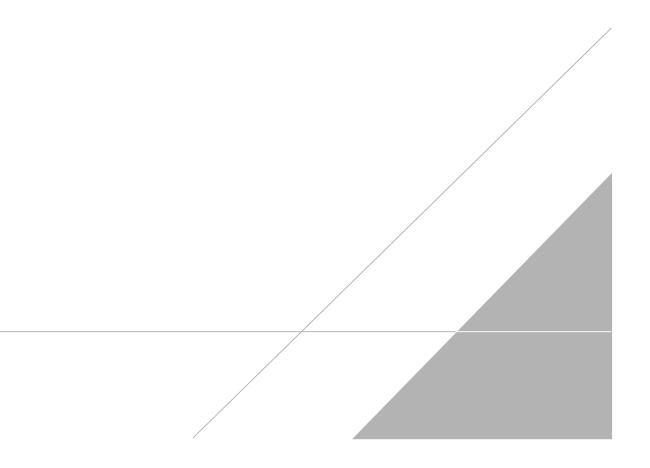
PEER REVIEW: Andrew Korycinski

DATE: August 27, 2020

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS



Client Sample ID: TRIP BLANK Date Collected: 08/04/20 00:00 Date Received: 08/07/20 09:20

Lab Sample ID: 240-134639-1 Matrix: Water

Matrix: Water

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Method: 8260B - Volatile O Analyte	-	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene			1.0	0.46			Tiepuleu	08/14/20 11:29	1
cis-1.2-Dichloroethene		U -	1.0		0			08/14/20 11:29	1
,		-		0.38	0				I
Tetrachloroethene	1.0	U	1.0	0.33	ug/L			08/14/20 11:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.43	ug/L			08/14/20 11:29	1
Trichloroethene	1.0	U	1.0	0.36	ug/L			08/14/20 11:29	1
Vinyl chloride	1.0	U	1.0	0.50	ug/L			08/14/20 11:29	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		75 - 130			-		08/14/20 11:29	1
4-Bromofluorobenzene (Surr)	104		47 - 134					08/14/20 11:29	1
Toluene-d8 (Surr)	106		69 - 122					08/14/20 11:29	1
Dibromofluoromethane (Surr)	123		78 - 129					08/14/20 11:29	1

Client Sample ID: MW-128S_080420 Date Collected: 08/04/20 11:10 Date Received: 08/07/20 09:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/11/20 07:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	75		70 - 133			-		08/11/20 07:01	1
_ Method: 8260B - Volatile O	rganic Compo	unds (GC/	MS)						
Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/14/20 11:51	1
cis-1,2-Dichloroethene	1.0	U ←	1.0	0.38	ug/L			08/14/20 11:51	1
Tetrachloroethene	1.0	U	1.0	0.33	ug/L			08/14/20 11:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.43	ug/L			08/14/20 11:51	1
Trichloroethene	1.0	U	1.0	0.36	ug/L			08/14/20 11:51	1
Vinyl chloride	1.0	U	1.0	0.50	ug/L			08/14/20 11:51	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		75 - 130			-		08/14/20 11:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	99		75 - 130		08/14/20 11:51	1	
4-Bromofluorobenzene (Surr)	99	4	47 - 134		08/14/20 11:51	1	
Toluene-d8 (Surr)	99	(59 - 122		08/14/20 11:51	1	
Dibromofluoromethane (Surr)	115		78 - 129		08/14/20 11:51	1	

Lab Sample ID: 240-134639-2

Matrix: Water

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