

ANALYTICAL REPORT

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

Laboratory Job ID: 240-140931-1

Client Project/Site: Ford LTP

For:

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

Attn: Kristoffer Hinskey



Authorized for release by:
12/9/2020 10:11:15 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

Job ID: 240-140931-1

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.
□	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

Job ID: 240-140931-1

Job ID: 240-140931-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP

Report Number: 240-140931-1

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 11/25/2020 9:10 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.1° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples SUMP-34380CAPITOL-01_111920 (240-140931-1) and TRIP BLANK (240-140931-2) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 12/03/2020.

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

VOLATILE ORGANIC COMPOUNDS (GCMS SIM)

Sample SUMP-34380CAPITOL-01_111920 (240-140931-1) was analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The sample was analyzed on 12/01/2020.

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

Method Summary

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

Job ID: 240-140931-1

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

Protocol References:

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

Laboratory References:

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

Sample Summary

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

Job ID: 240-140931-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-140931-1	SUMP-34380CAPITOL-01_111920	Water	11/19/20 16:30	11/25/20 09:10	
240-140931-2	TRIP BLANK	Water	11/19/20 00:00	11/25/20 09:10	

Detection Summary

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

Job ID: 240-140931-1

Client Sample ID: SUMP-34380CAPITOL-01_111920

Lab Sample ID: 240-140931-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Tetrachloroethene	0.22	J	1.0	0.15	ug/L	1		8260B	Total/NA

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-140931-2

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

Job ID: 240-140931-1

Client Sample ID: SUMP-34380CAPITOL-01_111920

Lab Sample ID: 240-140931-1

Date Collected: 11/19/20 16:30

Matrix: Water

Date Received: 11/25/20 09:10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			12/01/20 14:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		70 - 133					12/01/20 14:14	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			12/03/20 12:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			12/03/20 12:45	1
Tetrachloroethene	0.22	J	1.0	0.15	ug/L			12/03/20 12:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			12/03/20 12:45	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			12/03/20 12:45	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			12/03/20 12:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	111		75 - 130					12/03/20 12:45	1
4-Bromofluorobenzene (Surr)	100		47 - 134					12/03/20 12:45	1
Toluene-d8 (Surr)	104		69 - 122					12/03/20 12:45	1
Dibromofluoromethane (Surr)	118		78 - 129					12/03/20 12:45	1

Client Sample Results

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

Job ID: 240-140931-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-140931-2

Date Collected: 11/19/20 00:00

Matrix: Water

Date Received: 11/25/20 09:10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			12/03/20 13:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			12/03/20 13:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			12/03/20 13:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			12/03/20 13:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			12/03/20 13:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			12/03/20 13:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	117		75 - 130		12/03/20 13:07	1
4-Bromofluorobenzene (Surr)	105		47 - 134		12/03/20 13:07	1
Toluene-d8 (Surr)	110		69 - 122		12/03/20 13:07	1
Dibromofluoromethane (Surr)	125		78 - 129		12/03/20 13:07	1

Surrogate Summary

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

Job ID: 240-140931-1

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (75-130)	BFB (47-134)	TOL (69-122)	DBFM (78-129)
240-140641-A-12 MS	Matrix Spike	115	104	107	125
240-140641-A-12 MSD	Matrix Spike Duplicate	110	113	108	115
240-140931-1	SUMP-34380CAPITOL-01_1119 20	111	100	104	118
240-140931-2	TRIP BLANK	117	105	110	125
LCS 240-463789/4	Lab Control Sample	108	100	99	110
MB 240-463789/6	Method Blank	105	91	96	114

Surrogate Legend

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

BFB = 4-Bromofluorobenzene (Surr)

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane (Surr)

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (70-133)			
240-140839-C-7 MS	Matrix Spike	102			
240-140839-C-7 MSD	Matrix Spike Duplicate	105			
240-140931-1	SUMP-34380CAPITOL-01_1119 20	97			
LCS 240-463494/4	Lab Control Sample	97			
MB 240-463494/5	Method Blank	98			

Surrogate Legend

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

QC Sample Results

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

Job ID: 240-140931-1

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

Lab Sample ID: MB 240-463789/6

Matrix: Water

Analysis Batch: 463789

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			12/03/20 10:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			12/03/20 10:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			12/03/20 10:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			12/03/20 10:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			12/03/20 10:09	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			12/03/20 10:09	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	105		75 - 130		12/03/20 10:09	1
4-Bromofluorobenzene (Surr)	91		47 - 134		12/03/20 10:09	1
Toluene-d8 (Surr)	96		69 - 122		12/03/20 10:09	1
Dibromofluoromethane (Surr)	114		78 - 129		12/03/20 10:09	1

Lab Sample ID: LCS 240-463789/4

Matrix: Water

Analysis Batch: 463789

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.8		ug/L		108	73 - 129
cis-1,2-Dichloroethene	10.0	11.2		ug/L		112	75 - 124
Tetrachloroethene	10.0	8.08		ug/L		81	70 - 125
trans-1,2-Dichloroethene	10.0	11.1		ug/L		111	74 - 130
Trichloroethene	10.0	8.82		ug/L		88	71 - 121
Vinyl chloride	10.0	11.1		ug/L		111	61 - 134

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	108		75 - 130
4-Bromofluorobenzene (Surr)	100		47 - 134
Toluene-d8 (Surr)	99		69 - 122
Dibromofluoromethane (Surr)	110		78 - 129

Lab Sample ID: 240-140641-A-12 MS

Matrix: Water

Analysis Batch: 463789

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	560	F1	250	900	F1	ug/L		135	68 - 121
Tetrachloroethene	64		250	251		ug/L		75	52 - 129
trans-1,2-Dichloroethene	25	U	250	302		ug/L		121	69 - 126
Trichloroethene	28		250	261		ug/L		93	56 - 124
Vinyl chloride	25	U	250	305		ug/L		122	49 - 136

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	115		75 - 130
4-Bromofluorobenzene (Surr)	104		47 - 134
Toluene-d8 (Surr)	107		69 - 122
Dibromofluoromethane (Surr)	125		78 - 129

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-140931-1

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

Lab Sample ID: 240-140641-A-12 MSD

Matrix: Water

Analysis Batch: 463789

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	560	F1	250	849		ug/L		114	68 - 121	6	35
Tetrachloroethene	64		250	294		ug/L		92	52 - 129	16	35
trans-1,2-Dichloroethene	25	U	250	295		ug/L		118	69 - 126	2	35
Trichloroethene	28		250	269		ug/L		96	56 - 124	3	35
Vinyl chloride	25	U	250	301		ug/L		120	49 - 136	2	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	110		75 - 130
4-Bromofluorobenzene (Surr)	113		47 - 134
Toluene-d8 (Surr)	108		69 - 122
Dibromofluoromethane (Surr)	115		78 - 129

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

Lab Sample ID: MB 240-463494/5

Matrix: Water

Analysis Batch: 463494

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			12/01/20 12:58	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		70 - 133		12/01/20 12:58	1

Lab Sample ID: LCS 240-463494/4

Matrix: Water

Analysis Batch: 463494

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.2		ug/L		102	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		70 - 133

Lab Sample ID: 240-140839-C-7 MS

Matrix: Water

Analysis Batch: 463494

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	6.5		10.0	17.1		ug/L		106	46 - 170

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	102		70 - 133

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-140931-1

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

Lab Sample ID: 240-140839-C-7 MSD

Matrix: Water

Analysis Batch: 463494

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	6.5		10.0	17.3		ug/L		108	46 - 170	1	26
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	105		70 - 133								

QC Association Summary

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

Job ID: 240-140931-1

GC/MS VOA

Analysis Batch: 463494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-140931-1	SUMP-34380CAPITOL-01_111920	Total/NA	Water	8260B SIM	
MB 240-463494/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-463494/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-140839-C-7 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-140839-C-7 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 463789

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-140931-1	SUMP-34380CAPITOL-01_111920	Total/NA	Water	8260B	
240-140931-2	TRIP BLANK	Total/NA	Water	8260B	
MB 240-463789/6	Method Blank	Total/NA	Water	8260B	
LCS 240-463789/4	Lab Control Sample	Total/NA	Water	8260B	
240-140641-A-12 MS	Matrix Spike	Total/NA	Water	8260B	
240-140641-A-12 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

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

Job ID: 240-140931-1

Client Sample ID: SUMP-34380CAPITOL-01_111920

Lab Sample ID: 240-140931-1

Date Collected: 11/19/20 16:30

Matrix: Water

Date Received: 11/25/20 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	463789	12/03/20 12:45	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	463494	12/01/20 14:14	SAM	TAL CAN

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-140931-2

Date Collected: 11/19/20 00:00

Matrix: Water

Date Received: 11/25/20 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	463789	12/03/20 13:07	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

Job ID: 240-140931-1

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	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	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	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-21
West Virginia DEP	State	210	12-31-20

Chain of Custody Record

TestAmerica Laboratory location: N. Canton --- 4101 Shuffel Street NW/ North Canton, OH 44720 / 330-497-9396

Client Contact Company Name: Arcadis Address: 28550 Cabot Drive, Suite 500 City/State/Zip: Novi, MI, 48377 Phone: 248-994-2240 Project Name: Ford LTP Project Number: 30050315.302.01 PO # 30050315.302.01		Regulatory program: DW NPDES RCRA Other: Client Project Manager: Kris Hinskey Telephone: 248-994-2240 Email: kris@hinskey.com Method of Shipment/Carrier: Shipping/Tracking No:		Site Contact: Angela DeGrandis Telephone: 734-320-0065 Analysis Turnaround Time 5 Day		Lab Contact: Mike DeMonico Telephone: 330-497-9396 For lab use only Walk-in client Lab sampling Job/SDG No:		TestAmerica Laboratories, Inc. COC No: 1 of 1 COCs	
Sample Identification SUMP-34380CAPITOL-01_111920 Trip Blank		Matrix Air <input checked="" type="checkbox"/> Aqueous <input checked="" type="checkbox"/> Sediment <input type="checkbox"/> Solid <input type="checkbox"/> Other:		Containers & Preservatives HCl <input checked="" type="checkbox"/> HNO3 <input type="checkbox"/> H2SO4 <input type="checkbox"/> ZnAc <input type="checkbox"/> NaOH <input type="checkbox"/> Unpres <input type="checkbox"/> Other:		Analyses Filtered Sample (Y / N) N G Composite=C / Grab=G 1,1-DCE 82608 <input checked="" type="checkbox"/> X cis-1,2-DCE 82608 <input checked="" type="checkbox"/> X Trans-1,2-DCE 82608 <input checked="" type="checkbox"/> X PCE 82608 <input checked="" type="checkbox"/> X TCE 82608 <input checked="" type="checkbox"/> X Vinyl Chloride 82608 <input checked="" type="checkbox"/> X 1,4-Dioxane 82608 SIM <input checked="" type="checkbox"/> X		Sample Specific Notes / Special Instructions:	
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									
Special Instructions/QC Requirements & Comments: Submit all results through Cadena at jim.tomalia@cadenalabs.com. Cadena #E203631 Level IV Reporting.									
Relinquished by: <i>Bob Turner</i> Date/Time: 11/20/20 10:30 Company: Arcadis		Received by: <i>David Carr</i> Date/Time: 11/24/20 11:50 Company: Arcadis		Relinquished by: <i>Jim Tomalia</i> Date/Time: 11/24/20 17:00 Company: Arcadis		Received in Laboratory by: <i>Sammy Dyer</i> Date/Time: 11-25-20 9:10 Company: Arcadis		Date/Time: 11/20/20 10:30 Date/Time: 11/24/20 11:50 Date/Time: 11-25-20 9:10	

DATA VERIFICATION REPORT



December 09, 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: 30050315.302.01 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 140931-1
Sample date: 2020-11-19
Report received by CADENA: 2020-12-09
Initial Data Verification completed by CADENA: 2020-12-09
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:

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 463789.

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: 140931-1

Sample Name: SUMP-34380CAPITOL-01_111920 TRIP BLANK
Lab Sample ID: 2401409311 2401409312
Sample Date: 11/19/2020 11/19/2020

Analyte	Cas No.	Result	Report	Units	Valid	Result	Report	Units	Valid	
			Limit		Qualifier		Limit		Qualifier	
GC/MS VOC										
OSW-8260B										
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	0.22	1.0	ug/l	J	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	---	
OSW-8260BBSim										
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 #240-140931-1

CADENA Verification Report: 2020-12-09

Analyses Performed By:

TestAmerica
Canton, Ohio

Report #39459R

Review Level: Tier III

Project: 30050315.302.02



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-140931-1 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:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						VOC (Full Scan)	VOC (SIM)	MISC
240-140931-1	SUMP-34380CAPITOL-01_111920	240-140931-1	Water	11/19/2020		X	X	
	TRIP BLANK	240-140931-2	Water	11/19/2020		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 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.

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 insure 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. Compound Identification

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

DATA REVIEW

All identified compounds met the specified criteria.

6. 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		
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

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE:



DATE: December 9, 2020

PEER REVIEW: Joseph C. Houser

DATE: December 9, 2020



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




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



Chain of Custody Record

TestAmerica Laboratory location: N. Canton --- 4101 Shuffel Street NW/ North Canton, OH 44720 / 330-497-9396

Client Contact Company Name: Arcadis Address: 28550 Cabot Drive, Suite 500 City/State/Zip: Novi, MI, 48377 Phone: 248-994-2240 Project Name: Ford LTP Project Number: 30050315.302.01 PO # 30050315.302.01		Regulatory program: DW NPDES RCRA Other: Client Project Manager: Kris Hinskey Telephone: 248-994-2240 Email: kris@hinskey.com Method of Shipment/Carrier: Shipping/Tracking No:		Site Contact: Angela DeGrandis Telephone: 734-320-0065 Analysis Turnaround Time 5 Day		Lab Contact: Mike DeMonico Telephone: 330-497-9396 For lab use only Walk-in client Lab sampling Job/SDG No:		TestAmerica Laboratories, Inc. COC No: 1 of 1 COCs	
Sample Identification SUMP-34380CAPITOL-01_111920 Trip Blank		Matrix Air <input checked="" type="checkbox"/> Aqueous <input checked="" type="checkbox"/> Sediment <input type="checkbox"/> Solid <input type="checkbox"/> Other:		Containers & Preservatives HCl <input checked="" type="checkbox"/> HNO3 <input type="checkbox"/> H2SO4 <input type="checkbox"/> ZnAc <input type="checkbox"/> NaOH <input type="checkbox"/> Unpres <input type="checkbox"/> Other:		Analyses Filtered Sample (Y / N) N G Composite=C / Grab=G 1,1-DCE 82608 <input checked="" type="checkbox"/> cis-1,2-DCE 82608 <input checked="" type="checkbox"/> Trans-1,2-DCE 82608 <input checked="" type="checkbox"/> PCE 82608 <input checked="" type="checkbox"/> TCE 82608 <input checked="" type="checkbox"/> Vinyl Chloride 82608 <input checked="" type="checkbox"/> 1,4-Dioxane 82608 SIM <input checked="" type="checkbox"/>		Sample Specific Notes / Special Instructions:	
<div style="text-align: center;">  240-140931 Chain of Custody </div>									
Possible Hazard Identification X Non-Hazard ___ Flammable ___ Skin Irritant ___ Poison B ___ Unknown Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ___ Return to Client ___ X Disposal By Lab ___ Archive For ___ Months									
Special Instructions/QC Requirements & Comments: Submit all results through Cadena at jim.tomalia@cadenalabs.com. Cadena #E203631 Level IV Reporting.									
Relinquished by: <i>Bob Turner</i> Date/Time: 11/20/20 10:30 Company: Arcadis		Received by: <i>David Carr</i> Date/Time: 11/24/20 11:50 Company: Arcadis		Relinquished by: <i>Jim Tomalia</i> Date/Time: 11/24/20 17:00 Company: Arcadis		Received in Laboratory by: <i>Sammy Dyer</i> Date/Time: 11/25/20 9:10 Company: Arcadis		Date/Time: 11/20/20 10:30 Date/Time: 11/24/20 11:50 Date/Time: 11/25/20 9:10	

Client Sample Results

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

Job ID: 240-140931-1

Client Sample ID: SUMP-34380CAPITOL-01_111920

Lab Sample ID: 240-140931-1

Date Collected: 11/19/20 16:30

Matrix: Water

Date Received: 11/25/20 09:10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			12/01/20 14:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		70 - 133					12/01/20 14:14	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			12/03/20 12:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			12/03/20 12:45	1
Tetrachloroethene	0.22	J	1.0	0.15	ug/L			12/03/20 12:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			12/03/20 12:45	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			12/03/20 12:45	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			12/03/20 12:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	111		75 - 130					12/03/20 12:45	1
4-Bromofluorobenzene (Surr)	100		47 - 134					12/03/20 12:45	1
Toluene-d8 (Surr)	104		69 - 122					12/03/20 12:45	1
Dibromofluoromethane (Surr)	118		78 - 129					12/03/20 12:45	1

Client Sample Results

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

Job ID: 240-140931-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-140931-2

Date Collected: 11/19/20 00:00

Matrix: Water

Date Received: 11/25/20 09:10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			12/03/20 13:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			12/03/20 13:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			12/03/20 13:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			12/03/20 13:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			12/03/20 13:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			12/03/20 13:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	117		75 - 130		12/03/20 13:07	1
4-Bromofluorobenzene (Surr)	105		47 - 134		12/03/20 13:07	1
Toluene-d8 (Surr)	110		69 - 122		12/03/20 13:07	1
Dibromofluoromethane (Surr)	125		78 - 129		12/03/20 13:07	1

12/3/2020

Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #:
Workorder #: 2011571

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 11/24/2020 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott
Project Manager

WORK ORDER #: 2011571

Work Order Summary

CLIENT:	Mr. Jim Tomalia Arcadis U.S., Inc. 28550 Cabot Dr. Suite 500 Novi, MI 48377	BILL TO:	Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129
PHONE:	517-819-0356	P.O. #	30050315.0302.01
FAX:		PROJECT #	Ford LTP
DATE RECEIVED:	11/24/2020	CONTACT:	Ausha Scott
DATE COMPLETED:	12/03/2020		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	AA-34380CAPITOL-01_111920	Modified TO-15	5.5 "Hg	5 psi
02A	IAF-34380CAPITOL-02_111920	Modified TO-15	7.0 "Hg	5 psi
03A	IAB-34380CAPITOL-03_111920	Modified TO-15	7.0 "Hg	5 psi
04A	IAG-34380CAPITOL-01_111920	Modified TO-15	5.0 "Hg	5 psi
04B	IAG-34380CAPITOL-01_111920	Modified TO-15	5.0 "Hg	5 psi
05A	Lab Blank	Modified TO-15	NA	NA
05B	Lab Blank	Modified TO-15	NA	NA
06A	CCV	Modified TO-15	NA	NA
06B	CCV	Modified TO-15	NA	NA
07A	LCS	Modified TO-15	NA	NA
07AA	LCSD	Modified TO-15	NA	NA
07B	LCS	Modified TO-15	NA	NA
07BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY:



Technical Director

DATE: 12/03/20

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935

Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)

Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.

Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, LLC.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
Modified TO-15
Arcadis U.S., Inc.
Workorder# 2011571

Four 6 Liter Summa Canister (100% Cert Ambient) samples were received on November 24, 2020. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the EATL modifications.

<i>Requirement</i>	<i>TO-15</i>	<i>ATL Modifications</i>
Initial Calibration	<=30% RSD with 2 compounds allowed out to < 40% RSD	<=30% RSD with 4 compounds allowed out to < 40% RSD
Blank and standards	Zero Air	UHP Nitrogen provides a higher purity gas matrix than zero air

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified may be false positives.

Dilution was performed on sample IAG-34380CAPITOL-01_111920 due to the presence of high level target species.

The results for sample IAG-34380CAPITOL-01_111920 was acquired from two separate data files originating from the same analytical run. The two data files have the same base file name and are differentiated with a "sim" extension on the SIM data file.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates

as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	AA-34380CAPITOL-01_111920	Date/Time Analyzed:	12/1/20 07:13 AM
Lab ID:	2011571-01A	Dilution Factor:	1.64
Date/Time Collected:	11/19/20 04:00 PM	Instrument/File name:	msd20.i / 20113008
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.37	0.57	0.65	Not Detected
1,4-Dioxane	123-91-1	0.34	0.52	0.59	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.30	0.57	0.65	Not Detected
Tetrachloroethene	127-18-4	0.43	0.98	1.1	1.7
trans-1,2-Dichloroethene	156-60-5	0.32	0.57	0.65	Not Detected
Trichloroethene	79-01-6	0.46	0.78	0.88	Not Detected
Vinyl Chloride	75-01-4	0.13	0.37	0.42	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	106
4-Bromofluorobenzene	460-00-4	70-130	107
Toluene-d8	2037-26-5	70-130	94

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAF-34380CAPITOL-02_111920	Date/Time Analyzed:	12/1/20 07:52 AM
Lab ID:	2011571-02A	Dilution Factor:	1.75
Date/Time Collected:	11/19/20 04:05 PM	Instrument/Filename:	msd20.i / 20113009
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.39	0.61	0.69	Not Detected
1,4-Dioxane	123-91-1	0.37	0.55	0.63	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.33	0.61	0.69	Not Detected
Tetrachloroethene	127-18-4	0.46	1.0	1.2	260
trans-1,2-Dichloroethene	156-60-5	0.35	0.61	0.69	Not Detected
Trichloroethene	79-01-6	0.49	0.83	0.94	Not Detected
Vinyl Chloride	75-01-4	0.14	0.39	0.45	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	100
4-Bromofluorobenzene	460-00-4	70-130	109
Toluene-d8	2037-26-5	70-130	93

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAB-34380CAPITOL-03_111920	Date/Time Analyzed:	12/1/20 08:31 AM
Lab ID:	2011571-03A	Dilution Factor:	1.75
Date/Time Collected:	11/19/20 04:08 PM	Instrument/Filename:	msd20.i / 20113010
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.39	0.61	0.69	Not Detected
1,4-Dioxane	123-91-1	0.37	0.55	0.63	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.33	0.61	0.69	Not Detected
Tetrachloroethene	127-18-4	0.46	1.0	1.2	280
trans-1,2-Dichloroethene	156-60-5	0.35	0.61	0.69	Not Detected
Trichloroethene	79-01-6	0.49	0.83	0.94	Not Detected
Vinyl Chloride	75-01-4	0.14	0.39	0.45	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	101
4-Bromofluorobenzene	460-00-4	70-130	109
Toluene-d8	2037-26-5	70-130	93

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAG-34380CAPITOL-01_111920	Date/Time Analyzed:	12/1/20 11:22 AM
Lab ID:	2011571-04A	Dilution Factor:	16.1
Date/Time Collected:	11/19/20 04:02 PM	Instrument/Filename:	msd20.i / 20113013
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	3.6	5.6	6.4	Not Detected
1,4-Dioxane	123-91-1	3.4	5.1	5.8	Not Detected
cis-1,2-Dichloroethene	156-59-2	3.0	5.6	6.4	Not Detected
Tetrachloroethene	127-18-4	4.2	9.6	11	3300
trans-1,2-Dichloroethene	156-60-5	3.2	5.6	6.4	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	103
4-Bromofluorobenzene	460-00-4	70-130	107
Toluene-d8	2037-26-5	70-130	96

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	IAG-34380CAPITOL-01_111920	Date/Time Analyzed:	12/1/20 11:22 AM
Lab ID:	2011571-04B	Dilution Factor:	16.1
Date/Time Collected:	11/19/20 04:02 PM	Instrument/Filename:	msd20.i / 20113013sim
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.21	0.86	1.7	Not Detected
Vinyl Chloride	75-01-4	0.15	0.20	0.41	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	94
4-Bromofluorobenzene	460-00-4	70-130	106
Toluene-d8	2037-26-5	70-130	95

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	Lab Blank	Date/Time Analyzed:	12/1/20 06:18 AM
Lab ID:	2011571-05A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20113007a
Media:	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.22	0.35	0.40	Not Detected
1,4-Dioxane	123-91-1	0.21	0.32	0.36	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.19	0.35	0.40	Not Detected
Tetrachloroethene	127-18-4	0.26	0.60	0.68	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.20	0.35	0.40	Not Detected
Trichloroethene	79-01-6	0.28	0.47	0.54	Not Detected
Vinyl Chloride	75-01-4	0.081	0.22	0.26	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	116
4-Bromofluorobenzene	460-00-4	70-130	107
Toluene-d8	2037-26-5	70-130	94

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	Lab Blank	Date/Time Analyzed:	12/1/20 06:18 AM
Lab ID:	2011571-05B	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20113007sima
Media:	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.013	0.054	0.11	0.086 J
Vinyl Chloride	75-01-4	0.0093	0.013	0.026	Not Detected

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	111
4-Bromofluorobenzene	460-00-4	70-130	106
Toluene-d8	2037-26-5	70-130	96

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	CCV	Date/Time Analyzed:	11/30/20 06:58 PM
Lab ID:	2011571-06A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20113002
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	110
1,4-Dioxane	123-91-1	99
cis-1,2-Dichloroethene	156-59-2	113
Tetrachloroethene	127-18-4	102
trans-1,2-Dichloroethene	156-60-5	108
Trichloroethene	79-01-6	95
Vinyl Chloride	75-01-4	106

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	98
4-Bromofluorobenzene	460-00-4	70-130	94
Toluene-d8	2037-26-5	70-130	98

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	CCV	Date/Time Analyzed:	11/30/20 06:58 PM
Lab ID:	2011571-06B	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/File name:	msd20.i / 20113002sim
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
Trichloroethene	79-01-6	89
Vinyl Chloride	75-01-4	100

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	94
4-Bromofluorobenzene	460-00-4	70-130	91
Toluene-d8	2037-26-5	70-130	97

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	LCS	Date/Time Analyzed:	11/30/20 07:53 PM
Lab ID:	2011571-07A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/File name:	msd20.i / 20113003
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	106
1,4-Dioxane	123-91-1	101
cis-1,2-Dichloroethene	156-59-2	109
Tetrachloroethene	127-18-4	100
trans-1,2-Dichloroethene	156-60-5	104
Trichloroethene	79-01-6	95
Vinyl Chloride	75-01-4	102

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	96
4-Bromofluorobenzene	460-00-4	70-130	96
Toluene-d8	2037-26-5	70-130	97

* % Recovery is calculated using unrounded analytical results.

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	LCSD	Date/Time Analyzed:	11/30/20 08:42 PM
Lab ID:	2011571-07AA	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/File name:	msd20.i / 20113004
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	108
1,4-Dioxane	123-91-1	101
cis-1,2-Dichloroethene	156-59-2	110
Tetrachloroethene	127-18-4	102
trans-1,2-Dichloroethene	156-60-5	106
Trichloroethene	79-01-6	97
Vinyl Chloride	75-01-4	104

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	95
4-Bromofluorobenzene	460-00-4	70-130	97
Toluene-d8	2037-26-5	70-130	97

* % Recovery is calculated using unrounded analytical results.

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	LCS	Date/Time Analyzed:	11/30/20 07:53 PM
Lab ID:	2011571-07B	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20113003sim
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
Trichloroethene	79-01-6	90
Vinyl Chloride	75-01-4	96

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	93
4-Bromofluorobenzene	460-00-4	70-130	94
Toluene-d8	2037-26-5	70-130	96

* % Recovery is calculated using unrounded analytical results.

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	LCSD	Date/Time Analyzed:	11/30/20 08:42 PM
Lab ID:	2011571-07BB	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20113004sim
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
Trichloroethene	79-01-6	92
Vinyl Chloride	75-01-4	98

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	92
4-Bromofluorobenzene	460-00-4	70-130	94
Toluene-d8	2037-26-5	70-130	96

* % Recovery is calculated using unrounded analytical results.



December 03, 2020

Kris Hinskey
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CADENA project ID: E203631
Project: Ford Livonia Transmission Project - Soil Gas and Groundwater
Project number: 30050315.0302.01
Client project scope reference: Sample COC only was used to define project analytical requirements. Laboratory: Eurofins AirToxics - Folsom
Laboratory submittal: 2011571
Sample date: 2020-11-19
Report received by CADENA: 2020-12-03
Initial Data Verification completed: 2020-12-03

4 Air samples were analyzed for TO-15 parameters.

TO-15 method blank from 12/1 batch had a detection below the RL for trichloroethylene. Qualification of field results was not required based on this method blank detection.

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 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.

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) TO-15 Analysis

SDG #2011571

CADENA Verification Report: 2020-12-03

Analyses Performed By:
Eurofins Air Toxics
Folsom, California

Report #39460R
Review Level: Tier III
Project: 30050315.302.02



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 2011571 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:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						TO-15 (Full Scan)	TO-15 (SIM)	MISC
2011571	AA-34380CAPITOL-01_111920	2011571-01A	Air	11/19/2020		X		
	IAF-34380CAPITOL-02_111920	2011571-02A	Air	11/19/2020		X		
	IAB-34380CAPITOL-03_111920	2011571-03A	Air	11/19/2020		X		
	IAG-34380CAPITOL-01_111920	2011571-04B	Air	11/19/2020		X	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) Method TO-15 (Full Scan) and TO-15-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.

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	Return Canister Pressure
USEPA TO-15 and USEPA TO-15-SIM	Air	30 days from collection to analysis (Canister)	Ambient Temperature	< -2" Hg

All samples were analyzed within the specified holding time and canister return pressure / vacuum 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 (30%) 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 (30%) and RRF value greater than control limit (0.05).

All compounds associated with the continuing 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 requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than 140% or less than 60% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

DATA REVIEW

5. 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.

6. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 35% for air 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 not greater than five times the RL, a control limit of three times the RL is applied to the difference between the duplicate sample results.

A field duplicate was not performed on a sample within this SDG.

7. System Performance and Overall Assessment

The laboratory noted: Dilution was performed on sample IAG-34380CAPITOL-01_111920 due to the presence of high-level target species.

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: TO-15 (Full Scan) and TO-15 SIM	Reported		Performance Acceptable		Not Required	
	No	Yes	No	Yes		
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)						
Tier II Validation						
Canister return pressure (<-2"Hg)		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		
Internal standard		X		X		
Field Duplicate Sample RPD	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

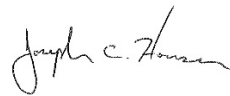
%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Joseph C. Houser

SIGNATURE:



DATE: December 9, 2020

PEER REVIEW: Andrew Korycinski

DATE: December 9, 2020



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



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



MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	AA-34380CAPITOL-01_111920	Date/Time Analyzed:	12/1/20 07:13 AM
Lab ID:	2011571-01A	Dilution Factor:	1.64
Date/Time Collected:	11/19/20 04:00 PM	Instrument/File name:	msd20.i / 20113008
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.37	0.57	0.65	Not Detected
1,4-Dioxane	123-91-1	0.34	0.52	0.59	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.30	0.57	0.65	Not Detected
Tetrachloroethene	127-18-4	0.43	0.98	1.1	1.7
trans-1,2-Dichloroethene	156-60-5	0.32	0.57	0.65	Not Detected
Trichloroethene	79-01-6	0.46	0.78	0.88	Not Detected
Vinyl Chloride	75-01-4	0.13	0.37	0.42	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	106
4-Bromofluorobenzene	460-00-4	70-130	107
Toluene-d8	2037-26-5	70-130	94

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAF-34380CAPITOL-02_111920	Date/Time Analyzed:	12/1/20 07:52 AM
Lab ID:	2011571-02A	Dilution Factor:	1.75
Date/Time Collected:	11/19/20 04:05 PM	Instrument/Filename:	msd20.i / 20113009
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.39	0.61	0.69	Not Detected
1,4-Dioxane	123-91-1	0.37	0.55	0.63	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.33	0.61	0.69	Not Detected
Tetrachloroethene	127-18-4	0.46	1.0	1.2	260
trans-1,2-Dichloroethene	156-60-5	0.35	0.61	0.69	Not Detected
Trichloroethene	79-01-6	0.49	0.83	0.94	Not Detected
Vinyl Chloride	75-01-4	0.14	0.39	0.45	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	100
4-Bromofluorobenzene	460-00-4	70-130	109
Toluene-d8	2037-26-5	70-130	93

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAB-34380CAPITOL-03_111920	Date/Time Analyzed:	12/1/20 08:31 AM
Lab ID:	2011571-03A	Dilution Factor:	1.75
Date/Time Collected:	11/19/20 04:08 PM	Instrument/Filename:	msd20.i / 20113010
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.39	0.61	0.69	Not Detected
1,4-Dioxane	123-91-1	0.37	0.55	0.63	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.33	0.61	0.69	Not Detected
Tetrachloroethene	127-18-4	0.46	1.0	1.2	280
trans-1,2-Dichloroethene	156-60-5	0.35	0.61	0.69	Not Detected
Trichloroethene	79-01-6	0.49	0.83	0.94	Not Detected
Vinyl Chloride	75-01-4	0.14	0.39	0.45	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	101
4-Bromofluorobenzene	460-00-4	70-130	109
Toluene-d8	2037-26-5	70-130	93

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	IAG-34380CAPITOL-01_111920	Date/Time Analyzed:	12/1/20 11:22 AM
Lab ID:	2011571-04A	Dilution Factor:	16.1
Date/Time Collected:	11/19/20 04:02 PM	Instrument/Filename:	msd20.i / 20113013
Media:	6 Liter Summa Canister (100% Cert Ambier)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	3.6	5.6	6.4	Not Detected
1,4-Dioxane	123-91-1	3.4	5.1	5.8	Not Detected
cis-1,2-Dichloroethene	156-59-2	3.0	5.6	6.4	Not Detected
Tetrachloroethene	127-18-4	4.2	9.6	11	3300
trans-1,2-Dichloroethene	156-60-5	3.2	5.6	6.4	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	103
4-Bromofluorobenzene	460-00-4	70-130	107
Toluene-d8	2037-26-5	70-130	96

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	IAG-34380CAPITOL-01_111920	Date/Time Analyzed:	12/1/20 11:22 AM
Lab ID:	2011571-04B	Dilution Factor:	16.1
Date/Time Collected:	11/19/20 04:02 PM	Instrument/Filename:	msd20.i / 20113013sim
Media:	6 Liter Summa Canister (100% Cert Ambier		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.21	0.86	1.7	Not Detected
Vinyl Chloride	75-01-4	0.15	0.20	0.41	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	94
4-Bromofluorobenzene	460-00-4	70-130	106
Toluene-d8	2037-26-5	70-130	95

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

PID: _____ Workorder # **2011571**

180 Blue Ravine Rd. Suite B, Folsom, CA 95630

Phone (800) 985-5955; Fax (916) 351-8279

Click links below to view:

Canister Sampling Guide

Helium Shroud Video

Client: Ford PID: NA

Project Name: Ford LTP

Project Manager: Kris Hinskey P.O.# 30050315.0302.01

Sampler: Seth Turner, Andrew Banitt

Site Name: 34380 capitol

Special Instructions/Notes: Report ONLY: 1,1-DCE, cis-1,2-

DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit

results through Cadena at jim.tomalia@cadena.com. Cadena

#E203631. Level IV Reporting

Turnaround Time (Rush surcharges may apply)

5 Day Turnaround Time

Canister Vacuum/Pressure

Requested Analyses

Lab Use Only

TO-15 (See
Special
Instructions/Notes)

Do Not Analyze

1000

.....

[illegible]

Relinquished by: (Signature/Affiliation)

Date	11/20/20	Time	1100
------	----------	------	------

Received by: (Signature/Affiliation)

Date	Time
------	------

Relinquished by: (Signature/Affiliation)

Date	Time
------	------

Received by: (Signature/Affiliation)

Date	Time
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Relinquished by: (Signature/Affiliation)

Date	Time
------	------

Received by: (Signature/Affiliation)

Date	Time
------	------

Lab Use Only

Shipper Name:	<u>FIDEL</u>	Custody Seals Intact?	Yes	No	None
---------------	--------------	-----------------------	-----	----	------

Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, of shipping of samples. D.O.T Hotline (800) 467-4922

12/3/2020

Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #:
Workorder #: 2011572

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 11/24/2020 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott
Project Manager

WORK ORDER #: 2011572

Work Order Summary

CLIENT:	Mr. Jim Tomalia Arcadis U.S., Inc. 28550 Cabot Dr. Suite 500 Novi, MI 48377	BILL TO:	Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129
PHONE:	517-819-0356	P.O. #	30050315.0302.01
FAX:		PROJECT #	Ford LTP
DATE RECEIVED:	11/24/2020	CONTACT:	Ausha Scott
DATE COMPLETED:	12/03/2020		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	SSMP-34380CAPITOL-01_111920	TO-15	6.0 "Hg	15 psi
02A	Lab Blank	TO-15	NA	NA
03A	CCV	TO-15	NA	NA
04A	LCS	TO-15	NA	NA
04AA	LCSD	TO-15	NA	NA

CERTIFIED BY:



Technical Director

DATE: 12/03/20

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935

Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)

Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.

Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, LLC.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
Arcadis U.S., Inc.
Workorder# 2011572

One 1 Liter Summa Canister (100% Certified) sample was received on November 24, 2020. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified may be false positives.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	SSMP-34380CAPITOL-01_111920	Date/Time Analyzed:	12/2/20 02:29 PM
Lab ID:	2011572-01A	Dilution Factor:	2.52
Date/Time Collected:	11/19/20 04:43 PM	Instrument/File name:	msdj.i / j120209
Media:	1 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.7	3.0	5.0	Not Detected
1,4-Dioxane	123-91-1	4.4	12	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	1.3	3.0	5.0	Not Detected
Tetrachloroethene	127-18-4	2.4	5.1	8.5	100
trans-1,2-Dichloroethene	156-60-5	1.0	3.0	5.0	Not Detected
Trichloroethene	79-01-6	1.6	4.1	6.8	Not Detected
Vinyl Chloride	75-01-4	0.58	1.9	3.2	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	94
4-Bromofluorobenzene	460-00-4	70-130	103
Toluene-d8	2037-26-5	70-130	101

EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	Lab Blank	Date/Time Analyzed:	12/2/20 01:18 PM
Lab ID:	2011572-02A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdj.i / j120208c
Media:	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.67	1.2	2.0	Not Detected
1,4-Dioxane	123-91-1	1.8	4.9	7.2	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.52	1.2	2.0	Not Detected
Tetrachloroethene	127-18-4	0.95	2.0	3.4	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.40	1.2	2.0	Not Detected
Trichloroethene	79-01-6	0.64	1.6	2.7	Not Detected
Vinyl Chloride	75-01-4	0.23	0.77	1.3	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	91
4-Bromofluorobenzene	460-00-4	70-130	97
Toluene-d8	2037-26-5	70-130	96

EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	CCV	Date/Time Analyzed:	12/2/20 11:13 AM
Lab ID:	2011572-03A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdj.i / j120205
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	88
1,4-Dioxane	123-91-1	92
cis-1,2-Dichloroethene	156-59-2	95
Tetrachloroethene	127-18-4	112
trans-1,2-Dichloroethene	156-60-5	95
Trichloroethene	79-01-6	94
Vinyl Chloride	75-01-4	76

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	88
4-Bromofluorobenzene	460-00-4	70-130	115
Toluene-d8	2037-26-5	70-130	94

EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	LCS	Date/Time Analyzed:	12/2/20 10:03 AM
Lab ID:	2011572-04A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdj.i / j120203
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	92
1,4-Dioxane	123-91-1	92
cis-1,2-Dichloroethene	156-59-2	98
Tetrachloroethene	127-18-4	116
trans-1,2-Dichloroethene	156-60-5	98
Trichloroethene	79-01-6	99
Vinyl Chloride	75-01-4	79

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	91
4-Bromofluorobenzene	460-00-4	70-130	117
Toluene-d8	2037-26-5	70-130	96

* % Recovery is calculated using unrounded analytical results.

EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	LCSD	Date/Time Analyzed:	12/2/20 10:31 AM
Lab ID:	2011572-04AA	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdj.i / j120204
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	90
1,4-Dioxane	123-91-1	91
cis-1,2-Dichloroethene	156-59-2	98
Tetrachloroethene	127-18-4	114
trans-1,2-Dichloroethene	156-60-5	98
Trichloroethene	79-01-6	98
Vinyl Chloride	75-01-4	78

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	89
4-Bromofluorobenzene	460-00-4	70-130	117
Toluene-d8	2037-26-5	70-130	96

* % Recovery is calculated using unrounded analytical results.



December 03, 2020

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

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - Soil Gas and Groundwater
Project number: 30050315.0302.01
Client project scope reference: Sample COC only was used to define project analytical requirements. Laboratory: Eurofins AirToxics - Folsom
Laboratory submittal: 2011572
Sample date: 2020-11-19
Report received by CADENA: 2020-12-03
Initial Data Verification completed: 2020-12-03

1 Air sample was analyzed for TO-15 parameters.

No QC non-conformances were observed as part of this level 2 verification review.

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 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.

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) TO-15 Analysis

SDG #2011572

CADENA Verification Report: 2020-12-03

Analyses Performed By:
Eurofins Air Toxics
Folsom, California

Report #39461R
Review Level: Tier III
Project: 30050315.302.02



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 2011572 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:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						TO-15 (Full Scan)	TO-15 (SIM)	MISC
2011572	SSMP-34380CAPITOL-01_111920	2011572-01A	Air	11/19/2020		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) Method TO-15 (Full Scan). 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	Return Canister Pressure
USEPA TO-15	Air	30 days from collection to analysis (Canister)	Ambient Temperature	< -2" Hg

All samples were analyzed within the specified holding time and canister return pressure / vacuum 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 (30%) 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 (30%) and RRF value greater than control limit (0.05).

All compounds associated with the continuing 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 requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than 140% or less than 60% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

DATA REVIEW

5. 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.

6. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 35% for air 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 not greater than five times the RL, a control limit of three times the RL is applied to the difference between the duplicate sample results.

A field duplicate was not performed on a sample 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 REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: TO-15 (Full Scan)	Reported		Performance Acceptable		Not Required	
	No	Yes	No	Yes		
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)						
Tier II Validation						
Canister return pressure (<-2"Hg)		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		
Internal standard		X		X		
Field Duplicate Sample RPD	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

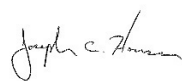
%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Joseph C. Houser

SIGNATURE:



DATE: December 9, 2020

PEER REVIEW: Andrew Korycinski

DATE: December 9, 2020



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



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



EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

Client ID:	SSMP-34380CAPITOL-01_111920	Date/Time Analyzed:	12/2/20 02:29 PM
Lab ID:	2011572-01A	Dilution Factor:	2.52
Date/Time Collected:	11/19/20 04:43 PM	Instrument/File name:	msdj.i / j120209
Media:	1 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.7	3.0	5.0	Not Detected
1,4-Dioxane	123-91-1	4.4	12	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	1.3	3.0	5.0	Not Detected
Tetrachloroethene	127-18-4	2.4	5.1	8.5	100
trans-1,2-Dichloroethene	156-60-5	1.0	3.0	5.0	Not Detected
Trichloroethene	79-01-6	1.6	4.1	6.8	Not Detected
Vinyl Chloride	75-01-4	0.58	1.9	3.2	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	94
4-Bromofluorobenzene	460-00-4	70-130	103
Toluene-d8	2037-26-5	70-130	101

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

PID: _____ Workorder **2011572**

Click links below to view:

Canister Sampling Guide

Helium Shroud Video

180 Blue Ravine Rd. Suite B, Folsom, CA 95630

Phone (800) 985-5955; Fax (916) 351-8279

[illegible]