

ANALYTICAL REPORT

PREPARED FOR

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JOB DESCRIPTION

Ford LTP

JOB NUMBER

240-204332-1

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Job Notes

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Authorization



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Definitions/Glossary

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

Job ID: 240-204332-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Arcadis U.S., Inc.
Project: Ford LTP

Job ID: 240-204332-1

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Job Narrative 240-204332-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 5/11/2024 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.2°C and 3.9°C.

GC/MS VOA

Method 8260D: The MS/MSD for batch 613143 was not analyzed due to an instrument malfunction.
TRIP BLANK_39 (240-204332-1), MW-137S_050624 (240-204332-2), MW-80SR_050624 (240-204332-3) and DUP-13 (240-204332-4)

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

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Method Summary

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

Job ID: 240-204332-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CLE
8260D SIM	Volatile Organic Compounds (GC/MS)	SW846	EET CLE
5030C	Purge and Trap	SW846	EET CLE

Protocol References:

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

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396



Sample Summary

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

Job ID: 240-204332-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-204332-1	TRIP BLANK_39	Water	05/06/24 00:00	05/11/24 08:00
240-204332-2	MW-137S_050624	Water	05/06/24 11:40	05/11/24 08:00
240-204332-3	MW-80SR_050624	Water	05/06/24 13:05	05/11/24 08:00
240-204332-4	DUP-13	Water	05/06/24 00:00	05/11/24 08:00
240-204332-5	MW-76_050824	Water	05/08/24 13:35	05/11/24 08:00
240-204332-6	MW-76S_050824	Water	05/08/24 14:30	05/11/24 08:00

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

Detection Summary

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

Job ID: 240-204332-1

Client Sample ID: TRIP BLANK_39

Lab Sample ID: 240-204332-1

No Detections.

Client Sample ID: MW-137S_050624

Lab Sample ID: 240-204332-2

No Detections.

Client Sample ID: MW-80SR_050624

Lab Sample ID: 240-204332-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	2.5		1.0	0.45	ug/L	1		8260D	Total/NA

Client Sample ID: DUP-13

Lab Sample ID: 240-204332-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	2.6		1.0	0.45	ug/L	1		8260D	Total/NA

Client Sample ID: MW-76_050824

Lab Sample ID: 240-204332-5

No Detections.

Client Sample ID: MW-76S_050824

Lab Sample ID: 240-204332-6

No Detections.

This Detection Summary does not include radiochemical test results.

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Client Sample Results

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

Job ID: 240-204332-1

Client Sample ID: TRIP BLANK_39

Lab Sample ID: 240-204332-1

Date Collected: 05/06/24 00:00

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/15/24 14:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/15/24 14:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 14:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/15/24 14:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 14:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/15/24 14:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		62 - 137		05/15/24 14:38	1
4-Bromofluorobenzene (Surr)	95		56 - 136		05/15/24 14:38	1
Toluene-d8 (Surr)	98		78 - 122		05/15/24 14:38	1
Dibromofluoromethane (Surr)	97		73 - 120		05/15/24 14:38	1

Client Sample Results

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

Job ID: 240-204332-1

Client Sample ID: MW-137S_050624

Lab Sample ID: 240-204332-2

Date Collected: 05/06/24 11:40

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D 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			05/17/24 20:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		68 - 127					05/17/24 20:15	1

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/15/24 15:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/15/24 15:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 15:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/15/24 15:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 15:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/15/24 15:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		62 - 137					05/15/24 15:01	1
4-Bromofluorobenzene (Surr)	92		56 - 136					05/15/24 15:01	1
Toluene-d8 (Surr)	94		78 - 122					05/15/24 15:01	1
Dibromofluoromethane (Surr)	96		73 - 120					05/15/24 15:01	1

Client Sample Results

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

Job ID: 240-204332-1

Client Sample ID: MW-80SR_050624

Lab Sample ID: 240-204332-3

Date Collected: 05/06/24 13:05

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D 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			05/17/24 20:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	108		68 - 127					05/17/24 20:38	1

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/15/24 15:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/15/24 15:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 15:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/15/24 15:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 15:24	1
Vinyl chloride	2.5		1.0	0.45	ug/L			05/15/24 15:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		62 - 137					05/15/24 15:24	1
4-Bromofluorobenzene (Surr)	93		56 - 136					05/15/24 15:24	1
Toluene-d8 (Surr)	96		78 - 122					05/15/24 15:24	1
Dibromofluoromethane (Surr)	100		73 - 120					05/15/24 15:24	1

Client Sample Results

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

Job ID: 240-204332-1

Client Sample ID: DUP-13

Lab Sample ID: 240-204332-4

Date Collected: 05/06/24 00:00

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D 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			05/17/24 21:02	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		68 - 127					05/17/24 21:02	1

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/17/24 12:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/17/24 12:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/17/24 12:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/17/24 12:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/17/24 12:12	1
Vinyl chloride	2.6		1.0	0.45	ug/L			05/17/24 12:12	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		62 - 137					05/17/24 12:12	1
4-Bromofluorobenzene (Surr)	92		56 - 136					05/17/24 12:12	1
Toluene-d8 (Surr)	98		78 - 122					05/17/24 12:12	1
Dibromofluoromethane (Surr)	97		73 - 120					05/17/24 12:12	1

Client Sample Results

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

Job ID: 240-204332-1

Client Sample ID: MW-76_050824

Lab Sample ID: 240-204332-5

Date Collected: 05/08/24 13:35

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D 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			05/17/24 21:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		68 - 127					05/17/24 21:25	1

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/16/24 19:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/16/24 19:10	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/16/24 19:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/16/24 19:10	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/16/24 19:10	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/16/24 19:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		62 - 137					05/16/24 19:10	1
4-Bromofluorobenzene (Surr)	94		56 - 136					05/16/24 19:10	1
Toluene-d8 (Surr)	97		78 - 122					05/16/24 19:10	1
Dibromofluoromethane (Surr)	100		73 - 120					05/16/24 19:10	1

Client Sample Results

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

Job ID: 240-204332-1

Client Sample ID: MW-76S_050824

Lab Sample ID: 240-204332-6

Date Collected: 05/08/24 14:30

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D 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			05/17/24 21:49	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	108		68 - 127					05/17/24 21:49	1

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/16/24 19:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/16/24 19:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/16/24 19:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/16/24 19:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/16/24 19:33	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/16/24 19:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		62 - 137					05/16/24 19:33	1
4-Bromofluorobenzene (Surr)	95		56 - 136					05/16/24 19:33	1
Toluene-d8 (Surr)	98		78 - 122					05/16/24 19:33	1
Dibromofluoromethane (Surr)	98		73 - 120					05/16/24 19:33	1

Surrogate Summary

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

Job ID: 240-204332-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (62-137)	BFB (56-136)	TOL (78-122)	DBFM (73-120)
240-204319-A-2 MS	Matrix Spike	93	94	97	91
240-204319-C-2 MSD	Matrix Spike Duplicate	95	99	99	92
240-204332-1	TRIP BLANK_39	101	95	98	97
240-204332-2	MW-137S_050624	99	92	94	96
240-204332-3	MW-80SR_050624	100	93	96	100
240-204332-4	DUP-13	102	92	98	97
240-204332-5	MW-76_050824	103	94	97	100
240-204332-6	MW-76S_050824	101	95	98	98
240-204389-B-3 MS	Matrix Spike	94	101	99	95
240-204389-B-3 MSD	Matrix Spike Duplicate	95	100	98	95
LCS 240-613143/4	Lab Control Sample	99	100	101	95
LCS 240-613272/4	Lab Control Sample	94	98	100	97
LCS 240-613411/4	Lab Control Sample	96	99	100	94
MB 240-613143/7	Method Blank	103	96	99	99
MB 240-613272/7	Method Blank	100	94	97	97
MB 240-613411/7	Method Blank	100	93	95	97

Surrogate Legend

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

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)
		DCA (68-127)
240-204330-B-3 MS	Matrix Spike	109
240-204330-C-3 MSD	Matrix Spike Duplicate	101
240-204332-2	MW-137S_050624	106
240-204332-3	MW-80SR_050624	108
240-204332-4	DUP-13	103
240-204332-5	MW-76_050824	109
240-204332-6	MW-76S_050824	108
LCS 240-613472/4	Lab Control Sample	97
MB 240-613472/6	Method Blank	101

Surrogate Legend

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

QC Sample Results

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

Job ID: 240-204332-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 240-613143/7

Matrix: Water

Analysis Batch: 613143

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/15/24 13:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/15/24 13:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 13:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/15/24 13:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 13:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/15/24 13:06	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	103		62 - 137		05/15/24 13:06	1
4-Bromofluorobenzene (Surr)	96		56 - 136		05/15/24 13:06	1
Toluene-d8 (Surr)	99		78 - 122		05/15/24 13:06	1
Dibromofluoromethane (Surr)	99		73 - 120		05/15/24 13:06	1

Lab Sample ID: LCS 240-613143/4

Matrix: Water

Analysis Batch: 613143

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
cis-1,2-Dichloroethene	25.0	25.2		ug/L		101	77 - 123
Tetrachloroethene	25.0	24.7		ug/L		99	76 - 123
trans-1,2-Dichloroethene	25.0	23.6		ug/L		94	75 - 124
Trichloroethene	25.0	22.7		ug/L		91	70 - 122
Vinyl chloride	12.5	11.3		ug/L		90	60 - 144

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	99		62 - 137
4-Bromofluorobenzene (Surr)	100		56 - 136
Toluene-d8 (Surr)	101		78 - 122
Dibromofluoromethane (Surr)	95		73 - 120

Lab Sample ID: MB 240-613272/7

Matrix: Water

Analysis Batch: 613272

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/16/24 11:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/16/24 11:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/16/24 11:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/16/24 11:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/16/24 11:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/16/24 11:52	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	100		62 - 137		05/16/24 11:52	1
4-Bromofluorobenzene (Surr)	94		56 - 136		05/16/24 11:52	1
Toluene-d8 (Surr)	97		78 - 122		05/16/24 11:52	1

Eurofins Cleveland

QC Sample Results

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

Job ID: 240-204332-1

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

Lab Sample ID: MB 240-613272/7

Matrix: Water

Analysis Batch: 613272

Client Sample ID: Method Blank

Prep Type: Total/NA

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Dibromofluoromethane (Surr)	97		73 - 120		05/16/24 11:52	1

Lab Sample ID: LCS 240-613272/4

Matrix: Water

Analysis Batch: 613272

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
1,1-Dichloroethene	25.0	23.6		ug/L		94	63 - 134
cis-1,2-Dichloroethene	25.0	24.7		ug/L		99	77 - 123
Tetrachloroethene	25.0	24.0		ug/L		96	76 - 123
trans-1,2-Dichloroethene	25.0	22.2		ug/L		89	75 - 124
Trichloroethene	25.0	23.0		ug/L		92	70 - 122
Vinyl chloride	12.5	11.5		ug/L		92	60 - 144

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	94		62 - 137
4-Bromofluorobenzene (Surr)	98		56 - 136
Toluene-d8 (Surr)	100		78 - 122
Dibromofluoromethane (Surr)	97		73 - 120

Lab Sample ID: 240-204319-A-2 MS

Matrix: Water

Analysis Batch: 613272

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	%Rec Limits
				Result	Qualifier				
1,1-Dichloroethene	1.0	U	25.0	22.2		ug/L		89	56 - 135
cis-1,2-Dichloroethene	0.59	J	25.0	24.6		ug/L		96	66 - 128
Tetrachloroethene	1.0	U	25.0	22.3		ug/L		89	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	20.9		ug/L		84	56 - 136
Trichloroethene	1.0	U	25.0	20.3		ug/L		81	61 - 124
Vinyl chloride	1300	E	12.5	1240	E 4	ug/L		-618	43 - 157

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	93		62 - 137
4-Bromofluorobenzene (Surr)	94		56 - 136
Toluene-d8 (Surr)	97		78 - 122
Dibromofluoromethane (Surr)	91		73 - 120

Lab Sample ID: 240-204319-C-2 MSD

Matrix: Water

Analysis Batch: 613272

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD		Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
				Result	Qualifier						
1,1-Dichloroethene	1.0	U	25.0	23.3		ug/L		93	56 - 135	5	26
cis-1,2-Dichloroethene	0.59	J	25.0	24.2		ug/L		94	66 - 128	2	14
Tetrachloroethene	1.0	U	25.0	23.9		ug/L		96	62 - 131	7	20
trans-1,2-Dichloroethene	1.0	U	25.0	22.0		ug/L		88	56 - 136	5	15
Trichloroethene	1.0	U	25.0	21.3		ug/L		85	61 - 124	5	15

Eurofins Cleveland

QC Sample Results

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

Job ID: 240-204332-1

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

Lab Sample ID: 240-204319-C-2 MSD

Client Sample ID: Matrix Spike Duplicate

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 613272

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Vinyl chloride	1300	E	12.5	1260	E 4	ug/L		-412	43 - 157	2	24
MSD MSD											
Surrogate	%Recovery	Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	95		62 - 137								
4-Bromofluorobenzene (Surr)	99		56 - 136								
Toluene-d8 (Surr)	99		78 - 122								
Dibromofluoromethane (Surr)	92		73 - 120								

Lab Sample ID: MB 240-613411/7

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 613411

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/17/24 11:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/17/24 11:48	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/17/24 11:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/17/24 11:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/17/24 11:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/17/24 11:48	1
MB MB									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		62 - 137					05/17/24 11:48	1
4-Bromofluorobenzene (Surr)	93		56 - 136					05/17/24 11:48	1
Toluene-d8 (Surr)	95		78 - 122					05/17/24 11:48	1
Dibromofluoromethane (Surr)	97		73 - 120					05/17/24 11:48	1

Lab Sample ID: LCS 240-613411/4

Client Sample ID: Lab Control Sample

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 613411

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1-Dichloroethene	25.0	23.8		ug/L		95	63 - 134
cis-1,2-Dichloroethene	25.0	24.8		ug/L		99	77 - 123
Tetrachloroethene	25.0	24.5		ug/L		98	76 - 123
trans-1,2-Dichloroethene	25.0	22.3		ug/L		89	75 - 124
Trichloroethene	25.0	22.7		ug/L		91	70 - 122
Vinyl chloride	12.5	11.7		ug/L		93	60 - 144
LCS LCS							
Surrogate	%Recovery	Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	96		62 - 137				
4-Bromofluorobenzene (Surr)	99		56 - 136				
Toluene-d8 (Surr)	100		78 - 122				
Dibromofluoromethane (Surr)	94		73 - 120				

QC Sample Results

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

Job ID: 240-204332-1

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

Lab Sample ID: 240-204389-B-3 MS
Matrix: Water
Analysis Batch: 613411

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

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec	Limits
	Result	Qualifier	Added	Result	Qualifier					
1,1-Dichloroethene	1.0	U	25.0	21.6		ug/L		86		56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	23.1		ug/L		92		66 - 128
Tetrachloroethene	1.0	U	25.0	21.4		ug/L		86		62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	20.4		ug/L		82		56 - 136
Trichloroethene	1.0	U	25.0	19.9		ug/L		80		61 - 124
Vinyl chloride	1.0	U	12.5	11.5		ug/L		92		43 - 157
MS MS										
Surrogate	%Recovery	Qualifier	Limits							
1,2-Dichloroethane-d4 (Surr)	94		62 - 137							
4-Bromofluorobenzene (Surr)	101		56 - 136							
Toluene-d8 (Surr)	99		78 - 122							
Dibromofluoromethane (Surr)	95		73 - 120							

Lab Sample ID: 240-204389-B-3 MSD
Matrix: Water
Analysis Batch: 613411

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

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	Limits	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier						RPD	Limit
1,1-Dichloroethene	1.0	U	25.0	22.8		ug/L		91		56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	25.0	23.2		ug/L		93		66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	23.5		ug/L		94		62 - 131	9	20
trans-1,2-Dichloroethene	1.0	U	25.0	21.1		ug/L		84		56 - 136	3	15
Trichloroethene	1.0	U	25.0	21.2		ug/L		85		61 - 124	6	15
Vinyl chloride	1.0	U	12.5	11.4		ug/L		91		43 - 157	1	24
MSD MSD												
Surrogate	%Recovery	Qualifier	Limits									
1,2-Dichloroethane-d4 (Surr)	95		62 - 137									
4-Bromofluorobenzene (Surr)	100		56 - 136									
Toluene-d8 (Surr)	98		78 - 122									
Dibromofluoromethane (Surr)	95		73 - 120									

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

Lab Sample ID: MB 240-613472/6
Matrix: Water
Analysis Batch: 613472

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

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			05/17/24 13:36	1
MB MB									
Surrogate	%Recovery	Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	101		68 - 127						

QC Sample Results

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

Job ID: 240-204332-1

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

Lab Sample ID: LCS 240-613472/4

Matrix: Water

Analysis Batch: 613472

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dioxane	10.0	9.74		ug/L		97	75 - 121
Surrogate	%Recovery	LCS Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	97		68 - 127				

Lab Sample ID: 240-204330-B-3 MS

Matrix: Water

Analysis Batch: 613472

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dioxane	2.0	U	10.0	9.67		ug/L		97	20 - 180
Surrogate	%Recovery	MS Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	109		68 - 127						

Lab Sample ID: 240-204330-C-3 MSD

Matrix: Water

Analysis Batch: 613472

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	Limit
1,4-Dioxane	2.0	U	10.0	9.93		ug/L		99	20 - 180	3	20
Surrogate	%Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	101		68 - 127								

QC Association Summary

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

Job ID: 240-204332-1

GC/MS VOA

Analysis Batch: 613143

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-204332-1	TRIP BLANK_39	Total/NA	Water	8260D	
240-204332-2	MW-137S_050624	Total/NA	Water	8260D	
240-204332-3	MW-80SR_050624	Total/NA	Water	8260D	
MB 240-613143/7	Method Blank	Total/NA	Water	8260D	
LCS 240-613143/4	Lab Control Sample	Total/NA	Water	8260D	

Analysis Batch: 613272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-204332-5	MW-76_050824	Total/NA	Water	8260D	
240-204332-6	MW-76S_050824	Total/NA	Water	8260D	
MB 240-613272/7	Method Blank	Total/NA	Water	8260D	
LCS 240-613272/4	Lab Control Sample	Total/NA	Water	8260D	
240-204319-A-2 MS	Matrix Spike	Total/NA	Water	8260D	
240-204319-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260D	

Analysis Batch: 613411

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-204332-4	DUP-13	Total/NA	Water	8260D	
MB 240-613411/7	Method Blank	Total/NA	Water	8260D	
LCS 240-613411/4	Lab Control Sample	Total/NA	Water	8260D	
240-204389-B-3 MS	Matrix Spike	Total/NA	Water	8260D	
240-204389-B-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260D	

Analysis Batch: 613472

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-204332-2	MW-137S_050624	Total/NA	Water	8260D SIM	
240-204332-3	MW-80SR_050624	Total/NA	Water	8260D SIM	
240-204332-4	DUP-13	Total/NA	Water	8260D SIM	
240-204332-5	MW-76_050824	Total/NA	Water	8260D SIM	
240-204332-6	MW-76S_050824	Total/NA	Water	8260D SIM	
MB 240-613472/6	Method Blank	Total/NA	Water	8260D SIM	
LCS 240-613472/4	Lab Control Sample	Total/NA	Water	8260D SIM	
240-204330-B-3 MS	Matrix Spike	Total/NA	Water	8260D SIM	
240-204330-C-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260D SIM	

Lab Chronicle

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

Job ID: 240-204332-1

Client Sample ID: TRIP BLANK_39

Lab Sample ID: 240-204332-1

Date Collected: 05/06/24 00:00

Matrix: Water

Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	613143	LEE	EET CLE	05/15/24 14:38

Client Sample ID: MW-137S_050624

Lab Sample ID: 240-204332-2

Date Collected: 05/06/24 11:40

Matrix: Water

Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	613143	LEE	EET CLE	05/15/24 15:01
Total/NA	Analysis	8260D SIM		1	613472	MDH	EET CLE	05/17/24 20:15

Client Sample ID: MW-80SR_050624

Lab Sample ID: 240-204332-3

Date Collected: 05/06/24 13:05

Matrix: Water

Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	613143	LEE	EET CLE	05/15/24 15:24
Total/NA	Analysis	8260D SIM		1	613472	MDH	EET CLE	05/17/24 20:38

Client Sample ID: DUP-13

Lab Sample ID: 240-204332-4

Date Collected: 05/06/24 00:00

Matrix: Water

Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	613411	LEE	EET CLE	05/17/24 12:12
Total/NA	Analysis	8260D SIM		1	613472	MDH	EET CLE	05/17/24 21:02

Client Sample ID: MW-76_050824

Lab Sample ID: 240-204332-5

Date Collected: 05/08/24 13:35

Matrix: Water

Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	613272	LEE	EET CLE	05/16/24 19:10
Total/NA	Analysis	8260D SIM		1	613472	MDH	EET CLE	05/17/24 21:25

Client Sample ID: MW-76S_050824

Lab Sample ID: 240-204332-6

Date Collected: 05/08/24 14:30

Matrix: Water

Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	613272	LEE	EET CLE	05/16/24 19:33
Total/NA	Analysis	8260D SIM		1	613472	MDH	EET CLE	05/17/24 21:49

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Accreditation/Certification Summary

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

Job ID: 240-204332-1

Laboratory: Eurofins Cleveland

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	02-28-25
Georgia	State	4062	02-27-25
Illinois	NELAP	200004	07-31-24
Iowa	State	421	06-01-25
Kentucky (WW)	State	KY98016	12-30-24
Minnesota	NELAP	039-999-348	12-31-24
New Jersey	NELAP	OH001	06-30-24
New York	NELAP	10975	04-02-25
Ohio VAP	State	ORELAP 4062	02-27-25
Oregon	NELAP	4062	02-27-25
Pennsylvania	NELAP	68-00340	08-31-24
Texas	NELAP	T104704517-22-19	08-31-24
USDA	US Federal Programs	P330-18-00281	01-05-27
Virginia	NELAP	460175	09-14-24
West Virginia DEP	State	210	12-31-24



Temperature readings

Client Sample ID	Lab ID	Container Type	Container	Preservation	Preservation
			pH	Temp	Added
					Lot Number
TRIP BLANK 39	240-204332-A-1	Voa Vial 40ml	Hydrochloric Acid		
MW-137S_050624	240-204332-A-2	Voa Vial 40ml	Hydrochloric Acid		
MW-137S_050624	240-204332-B-2	Voa Vial 40ml	Hydrochloric Acid		
MW-137S_050624	240-204332-C-2	Voa Vial 40ml	Hydrochloric Acid		
MW-137S_050624	240-204332-D-2	Voa Vial 40ml	Hydrochloric Acid		
MW-137S_050624	240-204332-E-2	Voa Vial 40ml	Hydrochloric Acid		
MW-137S_050624	240-204332-F-2	Voa Vial 40ml	Hydrochloric Acid		
MW-80SR_050624	240-204332-A-3	Voa Vial 40ml	Hydrochloric Acid		
MW-80SR_050624	240-204332-B-3	Voa Vial 40ml	Hydrochloric Acid		
MW-80SR_050624	240-204332-C-3	Voa Vial 40ml	Hydrochloric Acid		
MW-80SR_050624	240-204332-D-3	Voa Vial 40ml	Hydrochloric Acid		
MW-80SR_050624	240-204332-E-3	Voa Vial 40ml	Hydrochloric Acid		
MW-80SR_050624	240-204332-F-3	Voa Vial 40ml	Hydrochloric Acid		
DUP-13	240-204332-A-4	Voa Vial 40ml	Hydrochloric Acid		
DUP-13	240-204332-B-4	Voa Vial 40ml	Hydrochloric Acid		
DUP-13	240-204332-C-4	Voa Vial 40ml	Hydrochloric Acid		
DUP-13	240-204332-D-4	Voa Vial 40ml	Hydrochloric Acid		
DUP-13	240-204332-E-4	Voa Vial 40ml	Hydrochloric Acid		
DUP-13	240-204332-F-4	Voa Vial 40ml	Hydrochloric Acid		
MW-76_050824	240-204332-A-5	Voa Vial 40ml	Hydrochloric Acid		
MW-76_050824	240-204332-B-5	Voa Vial 40ml	Hydrochloric Acid		
MW-76_050824	240-204332-C-5	Voa Vial 40ml	Hydrochloric Acid		
MW-76_050824	240-204332-D-5	Voa Vial 40ml	Hydrochloric Acid		
MW-76_050824	240-204332-E-5	Voa Vial 40ml	Hydrochloric Acid		
MW-76_050824	240-204332-F-5	Voa Vial 40ml	Hydrochloric Acid		
MW-76S_050824	240-204332-A-6	Voa Vial 40ml	Hydrochloric Acid		
MW-76S_050824	240-204332-B-6	Voa Vial 40ml	Hydrochloric Acid		
MW-76S_050824	240-204332-C-6	Voa Vial 40ml	Hydrochloric Acid		
MW-76S_050824	240-204332-D-6	Voa Vial 40ml	Hydrochloric Acid		
MW-76S_050824	240-204332-E-6	Voa Vial 40ml	Hydrochloric Acid		
MW-76S_050824	240-204332-F-6	Voa Vial 40ml	Hydrochloric Acid		

DATA VERIFICATION REPORT



May 28, 2024

Megan Meckley
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI US 48377

CADENA project ID: E203728
Project: Ford Livonia Transmission Plant - Soil Gas, Ground Water and Soil
Project number: 30206169.401.03
Event Specific Scope of Work References: Sample COC
Laboratory: Eurofins Environment Testing LLC - Cleveland
Laboratory submittal: 204332-1
Sample date: 2024-05-06 2024-05-08
Report received by CADENA: 2024-05-28
Initial Data Verification completed by CADENA: 2024-05-28
Number of Samples:6
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

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

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

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

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

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA 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: E203728

Laboratory: Eurofins Environment Testing LLC - Cleveland

Laboratory Submittal: 204332-1

Analyte	Cas No.	Sample Name: TRIP BLANK_39				MW-137S_050624				MW-80SR_050624				DUP-13				MW-76_050824				MW-76S_050824			
		Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier
GC/MS VOC																									
<u>OSW-8260D</u>																									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	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	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	2.5	1.0	ug/l	---	2.6	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
<u>OSW-8260DSIM</u>																									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

Data Review

Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG # 240-204332-1

CADENA Verification Report: 2024-05-28

Analyses Performed By:
Eurofins Cleveland
Barberton, Ohio

Report # 54280R
Review Level: Tier III
Project: 30206169.401.02

DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-204332-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_39	240-204332-1	Water	05/06/2024		X	
MW-137S_050624	240-204332-2	Water	05/06/2024		X	X
MW-80SR_050624	240-204332-3	Water	05/06/2024		X	X
DUP-13	240-204332-4	Water	05/06/2024	MW-80SR_050624	X	X
MW-76_050824	240-204332-5	Water	05/08/2024		X	X
MW-76S_050824	240-204332-6	Water	05/08/2024		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) SW-846 Method 8260D and 8260D SIM. Data were reviewed in accordance with USEPA National Functional Guidelines for Organic Superfund Methods Data Review, EPA 540-R-20-005, November 2020 (with reference to the historical USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999), as appropriate.

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.
 - UB Analyte considered non-detect at the listed value due to associated blank contamination.
 - 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 8260D/8260D-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

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

System performance and column resolution were acceptable.

3. Calibration

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

3.1 Initial Calibration

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

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

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

3.2 Continuing Calibration

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

All compounds associated with the 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 require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

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

Results for duplicate samples are summarized in the following table.

DATA REVIEW

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-80SR_050624 / DUP-13	Vinyl chloride	2.5	2.6	AC

Note:

AC – Acceptable

The results between the parent sample and field duplicate were acceptable.

6. Compound Identification

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

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

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

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

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

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Bindu Sree M B

SIGNATURE: 

DATE: June 13, 2024

PEER REVIEW: Andrew Korycinski

DATE: June 17, 2024

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



CHAIN OF CUSTODY

**CORRECTED SAMPLE ANALYSIS DATA
SHEETS**



Client Sample Results

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

Job ID: 240-204332-1

Client Sample ID: TRIP BLANK_39

Lab Sample ID: 240-204332-1

Date Collected: 05/06/24 00:00

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/15/24 14:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/15/24 14:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 14:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/15/24 14:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 14:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/15/24 14:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		62 - 137		05/15/24 14:38	1
4-Bromofluorobenzene (Surr)	95		56 - 136		05/15/24 14:38	1
Toluene-d8 (Surr)	98		78 - 122		05/15/24 14:38	1
Dibromofluoromethane (Surr)	97		73 - 120		05/15/24 14:38	1

Client Sample ID: MW-137S_050624

Lab Sample ID: 240-204332-2

Date Collected: 05/06/24 11:40

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D 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			05/17/24 20:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		68 - 127		05/17/24 20:15	1

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/15/24 15:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/15/24 15:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 15:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/15/24 15:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 15:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/15/24 15:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		62 - 137		05/15/24 15:01	1
4-Bromofluorobenzene (Surr)	92		56 - 136		05/15/24 15:01	1
Toluene-d8 (Surr)	94		78 - 122		05/15/24 15:01	1
Dibromofluoromethane (Surr)	96		73 - 120		05/15/24 15:01	1

Client Sample ID: MW-80SR_050624

Lab Sample ID: 240-204332-3

Date Collected: 05/06/24 13:05

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D 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			05/17/24 20:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	108		68 - 127		05/17/24 20:38	1

Client Sample Results

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

Job ID: 240-204332-1

Client Sample ID: MW-80SR_050624

Lab Sample ID: 240-204332-3

Date Collected: 05/06/24 13:05

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/15/24 15:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/15/24 15:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 15:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/15/24 15:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/15/24 15:24	1
Vinyl chloride	2.5		1.0	0.45	ug/L			05/15/24 15:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		62 - 137		05/15/24 15:24	1
4-Bromofluorobenzene (Surr)	93		56 - 136		05/15/24 15:24	1
Toluene-d8 (Surr)	96		78 - 122		05/15/24 15:24	1
Dibromofluoromethane (Surr)	100		73 - 120		05/15/24 15:24	1

Client Sample ID: DUP-13

Lab Sample ID: 240-204332-4

Date Collected: 05/06/24 00:00

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D 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			05/17/24 21:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		68 - 127		05/17/24 21:02	1

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/17/24 12:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/17/24 12:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/17/24 12:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/17/24 12:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/17/24 12:12	1
Vinyl chloride	2.6		1.0	0.45	ug/L			05/17/24 12:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		62 - 137		05/17/24 12:12	1
4-Bromofluorobenzene (Surr)	92		56 - 136		05/17/24 12:12	1
Toluene-d8 (Surr)	98		78 - 122		05/17/24 12:12	1
Dibromofluoromethane (Surr)	97		73 - 120		05/17/24 12:12	1

Client Sample ID: MW-76_050824

Lab Sample ID: 240-204332-5

Date Collected: 05/08/24 13:35

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D 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			05/17/24 21:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		68 - 127		05/17/24 21:25	1

Client Sample Results

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

Job ID: 240-204332-1

Client Sample ID: MW-76_050824

Lab Sample ID: 240-204332-5

Date Collected: 05/08/24 13:35

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/16/24 19:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/16/24 19:10	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/16/24 19:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/16/24 19:10	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/16/24 19:10	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/16/24 19:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		62 - 137		05/16/24 19:10	1
4-Bromofluorobenzene (Surr)	94		56 - 136		05/16/24 19:10	1
Toluene-d8 (Surr)	97		78 - 122		05/16/24 19:10	1
Dibromofluoromethane (Surr)	100		73 - 120		05/16/24 19:10	1

Client Sample ID: MW-76S_050824

Lab Sample ID: 240-204332-6

Date Collected: 05/08/24 14:30

Matrix: Water

Date Received: 05/11/24 08:00

Method: SW846 8260D 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			05/17/24 21:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	108		68 - 127		05/17/24 21:49	1

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			05/16/24 19:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/16/24 19:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/16/24 19:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/16/24 19:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/16/24 19:33	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/16/24 19:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		62 - 137		05/16/24 19:33	1
4-Bromofluorobenzene (Surr)	95		56 - 136		05/16/24 19:33	1
Toluene-d8 (Surr)	98		78 - 122		05/16/24 19:33	1
Dibromofluoromethane (Surr)	98		73 - 120		05/16/24 19:33	1