

 **ANALYTICAL REPORT****PREPARED FOR**

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JOB DESCRIPTION

Ford LTP - Off Site

JOB NUMBER

240-185646-1

Eurofins Cleveland

Job Notes

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The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



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Definitions/Glossary

Client: ARCADIS US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1-	Surrogate recovery exceeds control limits, low biased.
S1+	Surrogate recovery exceeds control limits, high biased.
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 US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Job ID: 240-185646-1

Laboratory: Eurofins Cleveland

Narrative

**Job Narrative
240-185646-1**

Receipt

The samples were received on 5/19/2023 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 0.8°C and 1.8°C

GC/MS VOA

Method 8260D: The continuing calibration verification (CCV) analyzed in batch 460-911905 was outside the method criteria for the following analyte(s): Trichloroethene. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

Method 8260D: Four surrogates are used for this analysis. The laboratory's SOP allows one of these surrogates to be outside acceptance criteria without performing re-extraction/re-analysis. The following samples contained an allowable number of surrogate compounds outside limits: TRIP BLANK_126 (240-185646-1) and MW-72_051723 (240-185646-2). These results have been reported and qualified.

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



Method Summary

Client: ARCADIS US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

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

Protocol References:

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

Laboratory References:

EET EDI = Eurofins Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900



Sample Summary

Client: ARCADIS US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-185646-1	TRIP BLANK_126	Water	05/17/23 00:00	05/19/23 08:00
240-185646-2	MW-72_051723	Water	05/17/23 10:15	05/19/23 08:00
240-185646-3	MW-72S_051723	Water	05/17/23 11:10	05/19/23 08:00
240-185646-4	MW-73D_051723	Water	05/17/23 12:00	05/19/23 08:00

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Detection Summary

Client: ARCADIS US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Client Sample ID: TRIP BLANK_126

Lab Sample ID: 240-185646-1

No Detections.

Client Sample ID: MW-72_051723

Lab Sample ID: 240-185646-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.75	J	1.0	0.45	ug/L	1		8260D	Total/NA

Client Sample ID: MW-72S_051723

Lab Sample ID: 240-185646-3

No Detections.

Client Sample ID: MW-73D_051723

Lab Sample ID: 240-185646-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.6		2.0	0.86	ug/L	1		8260D SIM	Total/NA

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Client Sample ID: TRIP BLANK_126

Lab Sample ID: 240-185646-1

Date Collected: 05/17/23 00:00

Matrix: Water

Date Received: 05/19/23 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			05/27/23 18:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/27/23 18:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 18:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/27/23 18:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 18:46	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/27/23 18:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		70 - 128		05/27/23 18:46	1
Dibromofluoromethane (Surr)	100		77 - 124		05/27/23 18:46	1
Toluene-d8 (Surr)	79	S1-	80 - 120		05/27/23 18:46	1
4-Bromofluorobenzene	104		76 - 120		05/27/23 18:46	1

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Client Sample ID: MW-72_051723

Lab Sample ID: 240-185646-2

Date Collected: 05/17/23 10:15

Matrix: Water

Date Received: 05/19/23 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			05/24/23 10:02	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	96		75 - 133					05/24/23 10:02	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			05/27/23 20:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/27/23 20:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 20:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/27/23 20:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 20:17	1
Vinyl chloride	0.75	J	1.0	0.45	ug/L			05/27/23 20:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		70 - 128					05/27/23 20:17	1
Dibromofluoromethane (Surr)	104		77 - 124					05/27/23 20:17	1
Toluene-d8 (Surr)	108		80 - 120					05/27/23 20:17	1
4-Bromofluorobenzene	125	S1+	76 - 120					05/27/23 20:17	1

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Client Sample ID: MW-72S_051723

Lab Sample ID: 240-185646-3

Date Collected: 05/17/23 11:10

Matrix: Water

Date Received: 05/19/23 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			05/24/23 10:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	96		75 - 133					05/24/23 10:24	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			05/27/23 21:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/27/23 21:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 21:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/27/23 21:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 21:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/27/23 21:02	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	94		70 - 128					05/27/23 21:02	1
Dibromofluoromethane (Surr)	107		77 - 124					05/27/23 21:02	1
Toluene-d8 (Surr)	90		80 - 120					05/27/23 21:02	1
4-Bromofluorobenzene	109		76 - 120					05/27/23 21:02	1

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Client Sample ID: MW-73D_051723

Lab Sample ID: 240-185646-4

Date Collected: 05/17/23 12:00

Matrix: Water

Date Received: 05/19/23 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	2.6		2.0	0.86	ug/L			05/24/23 10:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	96		75 - 133					05/24/23 10:45	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			05/27/23 21:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/27/23 21:25	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 21:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/27/23 21:25	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 21:25	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/27/23 21:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		70 - 128					05/27/23 21:25	1
Dibromofluoromethane (Surr)	107		77 - 124					05/27/23 21:25	1
Toluene-d8 (Surr)	104		80 - 120					05/27/23 21:25	1
4-Bromofluorobenzene	111		76 - 120					05/27/23 21:25	1

Surrogate Summary

Client: ARCADIS US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

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 (70-128)	DBFM (77-124)	TOL (80-120)	BFB (76-120)
240-185646-1	TRIP BLANK_126	93	100	79 S1-	104
240-185646-2	MW-72_051723	106	104	108	125 S1+
240-185646-2 MS	MW-72-MS_051723	99	97	94	101
240-185646-2 MSD	MW-72-MSD_051723	97	94	113	107
240-185646-3	MW-72S_051723	94	107	90	109
240-185646-4	MW-73D_051723	96	107	104	111
LCS 460-911905/3	Lab Control Sample	86	119	93	116
MB 460-911905/7	Method Blank	91	111	88	118

Surrogate Legend

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

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)
		BFB (75-133)
240-185646-2	MW-72_051723	96
240-185646-2 MS	MW-72-MS_051723	95
240-185646-2 MSD	MW-72-MSD_051723	96
240-185646-3	MW-72S_051723	96
240-185646-4	MW-73D_051723	96
LCS 460-911093/4	Lab Control Sample	97
LCSD 460-911093/5	Lab Control Sample Dup	98
MB 460-911093/9	Method Blank	96

Surrogate Legend

BFB = 4-Bromofluorobenzene

QC Sample Results

Client: ARCADIS US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

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

Lab Sample ID: MB 460-911905/7

Matrix: Water

Analysis Batch: 911905

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			05/27/23 18:23	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/27/23 18:23	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 18:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/27/23 18:23	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 18:23	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/27/23 18:23	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	91		70 - 128		05/27/23 18:23	1
Dibromofluoromethane (Surr)	111		77 - 124		05/27/23 18:23	1
Toluene-d8 (Surr)	88		80 - 120		05/27/23 18:23	1
4-Bromofluorobenzene	118		76 - 120		05/27/23 18:23	1

Lab Sample ID: LCS 460-911905/3

Matrix: Water

Analysis Batch: 911905

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	20.0	23.2		ug/L		116	68 - 133
cis-1,2-Dichloroethene	20.0	22.2		ug/L		111	78 - 121
Tetrachloroethene	20.0	20.4		ug/L		102	70 - 127
trans-1,2-Dichloroethene	20.0	22.1		ug/L		111	74 - 126
Trichloroethene	20.0	18.6		ug/L		93	71 - 121
Vinyl chloride	20.0	25.1		ug/L		126	55 - 144

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	86		70 - 128
Dibromofluoromethane (Surr)	119		77 - 124
Toluene-d8 (Surr)	93		80 - 120
4-Bromofluorobenzene	116		76 - 120

Lab Sample ID: 240-185646-2 MS

Matrix: Water

Analysis Batch: 911905

Client Sample ID: MW-72-MS_051723

Prep Type: Total/NA

Analyte	Sample	Sample	Spike Added	MS	MS	Unit	D	%Rec	%Rec Limits
	Result	Qualifier		Result	Qualifier				
1,1-Dichloroethene	1.0	U	20.0	20.7		ug/L		103	68 - 133
cis-1,2-Dichloroethene	1.0	U	20.0	20.6		ug/L		103	78 - 121
Tetrachloroethene	1.0	U	20.0	20.1		ug/L		101	70 - 127
trans-1,2-Dichloroethene	1.0	U	20.0	19.7		ug/L		98	74 - 126
Trichloroethene	1.0	U	20.0	20.4		ug/L		102	71 - 121
Vinyl chloride	0.75	J	20.0	18.9		ug/L		91	55 - 144

Surrogate	MS	MS	Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	99		70 - 128
Dibromofluoromethane (Surr)	97		77 - 124
Toluene-d8 (Surr)	94		80 - 120

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QC Sample Results

Client: ARCADIS US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

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

Lab Sample ID: 240-185646-2 MS
Matrix: Water
Analysis Batch: 911905

Client Sample ID: MW-72-MS_051723
Prep Type: Total/NA

	MS	MS	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene	101		76 - 120

Lab Sample ID: 240-185646-2 MSD
Matrix: Water
Analysis Batch: 911905

Client Sample ID: MW-72-MSD_051723
Prep Type: Total/NA

Analyte	Sample		Spike Added	MSD		Unit	D	%Rec	%Rec		RPD	
	Result	Qualifier		Result	Qualifier				Limits	RPD	Limit	
1,1-Dichloroethene	1.0	U	20.0	20.8		ug/L		104	68 - 133	1	30	
cis-1,2-Dichloroethene	1.0	U	20.0	20.9		ug/L		104	78 - 121	1	30	
Tetrachloroethene	1.0	U	20.0	23.7		ug/L		118	70 - 127	16	30	
trans-1,2-Dichloroethene	1.0	U	20.0	20.5		ug/L		103	74 - 126	4	30	
Trichloroethene	1.0	U	20.0	20.2		ug/L		101	71 - 121	1	30	
Vinyl chloride	0.75	J	20.0	21.3		ug/L		103	55 - 144	12	30	

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		70 - 128
Dibromofluoromethane (Surr)	94		77 - 124
Toluene-d8 (Surr)	113		80 - 120
4-Bromofluorobenzene	107		76 - 120

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

Lab Sample ID: MB 460-911093/9
Matrix: Water
Analysis Batch: 911093

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

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			05/24/23 07:52	1

	MB	MB		Prepared	Analyzed	Dil Fac
Surrogate	%Recovery	Qualifier	Limits			
4-Bromofluorobenzene	96		75 - 133		05/24/23 07:52	1

Lab Sample ID: LCS 460-911093/4
Matrix: Water
Analysis Batch: 911093

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

Analyte	Spike Added	LCS		Unit	D	%Rec	%Rec	
		Result	Qualifier				Limits	RPD
1,4-Dioxane	5.00	3.99		ug/L		80	57 - 124	

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene	97		75 - 133

Lab Sample ID: LCSD 460-911093/5
Matrix: Water
Analysis Batch: 911093

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

Analyte	Spike Added	LCSD		Unit	D	%Rec	%Rec		RPD	
		Result	Qualifier				Limits	RPD	Limit	
1,4-Dioxane	5.00	4.76		ug/L		95	57 - 124	18	30	

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

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

	<i>LCSD</i>	<i>LCSD</i>	
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
4-Bromofluorobenzene	98		75 - 133

Lab Sample ID: 240-185646-2 MS
Matrix: Water
Analysis Batch: 911093

Client Sample ID: MW-72-MS_051723
Prep Type: Total/NA

<i>Analyte</i>	<i>Sample</i>	<i>Sample</i>	<i>Spike</i>	<i>MS</i>	<i>MS</i>			<i>%Rec</i>	<i>Limits</i>
	<i>Result</i>	<i>Qualifier</i>	<i>Added</i>	<i>Result</i>	<i>Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>Limits</i>
1,4-Dioxane	2.0	U	5.00	4.87		ug/L		97	57 - 124

	<i>MS</i>	<i>MS</i>	
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
4-Bromofluorobenzene	95		75 - 133

Lab Sample ID: 240-185646-2 MSD
Matrix: Water
Analysis Batch: 911093

Client Sample ID: MW-72-MSD_051723
Prep Type: Total/NA

<i>Analyte</i>	<i>Sample</i>	<i>Sample</i>	<i>Spike</i>	<i>MSD</i>	<i>MSD</i>			<i>%Rec</i>	<i>Limits</i>	<i>RPD</i>	<i>Limit</i>
	<i>Result</i>	<i>Qualifier</i>	<i>Added</i>	<i>Result</i>	<i>Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>Limits</i>	<i>RPD</i>	<i>Limit</i>
1,4-Dioxane	2.0	U	5.00	4.40		ug/L		88	57 - 124	10	30

	<i>MSD</i>	<i>MSD</i>	
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
4-Bromofluorobenzene	96		75 - 133

QC Association Summary

Client: ARCADIS US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

GC/MS VOA

Analysis Batch: 911093

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-185646-2	MW-72_051723	Total/NA	Water	8260D SIM	
240-185646-3	MW-72S_051723	Total/NA	Water	8260D SIM	
240-185646-4	MW-73D_051723	Total/NA	Water	8260D SIM	
MB 460-911093/9	Method Blank	Total/NA	Water	8260D SIM	
LCS 460-911093/4	Lab Control Sample	Total/NA	Water	8260D SIM	
LCSD 460-911093/5	Lab Control Sample Dup	Total/NA	Water	8260D SIM	
240-185646-2 MS	MW-72-MS_051723	Total/NA	Water	8260D SIM	
240-185646-2 MSD	MW-72-MSD_051723	Total/NA	Water	8260D SIM	

Analysis Batch: 911905

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-185646-1	TRIP BLANK_126	Total/NA	Water	8260D	
240-185646-2	MW-72_051723	Total/NA	Water	8260D	
240-185646-3	MW-72S_051723	Total/NA	Water	8260D	
240-185646-4	MW-73D_051723	Total/NA	Water	8260D	
MB 460-911905/7	Method Blank	Total/NA	Water	8260D	
LCS 460-911905/3	Lab Control Sample	Total/NA	Water	8260D	
240-185646-2 MS	MW-72-MS_051723	Total/NA	Water	8260D	
240-185646-2 MSD	MW-72-MSD_051723	Total/NA	Water	8260D	

Lab Chronicle

Client: ARCADIS US Inc
 Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Client Sample ID: TRIP BLANK_126

Lab Sample ID: 240-185646-1

Date Collected: 05/17/23 00:00

Matrix: Water

Date Received: 05/19/23 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	911905	SZD	EET EDI	05/27/23 18:46

Client Sample ID: MW-72_051723

Lab Sample ID: 240-185646-2

Date Collected: 05/17/23 10:15

Matrix: Water

Date Received: 05/19/23 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	911905	SZD	EET EDI	05/27/23 20:17
Total/NA	Analysis	8260D SIM		1	911093	SZD	EET EDI	05/24/23 10:02

Client Sample ID: MW-72S_051723

Lab Sample ID: 240-185646-3

Date Collected: 05/17/23 11:10

Matrix: Water

Date Received: 05/19/23 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	911905	SZD	EET EDI	05/27/23 21:02
Total/NA	Analysis	8260D SIM		1	911093	SZD	EET EDI	05/24/23 10:24

Client Sample ID: MW-73D_051723

Lab Sample ID: 240-185646-4

Date Collected: 05/17/23 12:00

Matrix: Water

Date Received: 05/19/23 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	911905	SZD	EET EDI	05/27/23 21:25
Total/NA	Analysis	8260D SIM		1	911093	SZD	EET EDI	05/24/23 10:45

Laboratory References:

EET EDI = Eurofins Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

Accreditation/Certification Summary

Client: ARCADIS US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Laboratory: Eurofins Edison

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

Authority	Program	Identification Number	Expiration Date
Connecticut	State	PH-0818	01-30-24
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	01-01-24
Georgia	State	12028 (NJ)	06-30-23
Massachusetts	State	M-NJ312	06-30-23
New Jersey	NELAP	12028	06-30-23
New York	NELAP	11452	04-01-24
Pennsylvania	NELAP	68-00522	03-01-24
Rhode Island	State	LAO00376	12-30-23
USDA	US Federal Programs	P330-20-00244	11-03-23

Chain of Custody Record

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

Regulatory program: DW NPDES RCRA Other

Client Contact
Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City/State/Zip: Novi, MI, 48377
Phone: 248-994-2240

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

Site Contact: Christina Weaver
Telephone: 248-994-2240

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

Company Name: JOE FOSTIK
Method of Shipment/Carrier:
Shipping/Tracking No:

Sample Identification	Sample Date	Sample Time	Matrix			Containers & Preservatives					Filtered Sample (Y/N)	Composite (C/Grab-C)	Analyses						Sample Specific Notes / Special Instructions:						
			Air	Aqueous	Sediment	Solid	Other:	H2SO4	HNO3	HCl			NaOH	ZnAc	Uppers	Other:	1,1-DCE 8260B	cis-1,2-DCE 8260B		Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	
TRIP BLANK 126	---	---	1																						1 Trip Blank
MW-72-051723	5-17-23	1015	6																						3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-72-M5-051723	5-17-23	1015	6																						
MW-72-M5D-051723	5-17-23	1015	6																						
MW-725-051723	5-17-23	1110	6																						
MW-73D-051723	5-17-23	1200	6																						



Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown
 Return to Client Disposal By Lab Archive For _____ Months

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

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

Relinquished by:	Relinquished by:	Relinquished by:	Company:	Date/Time:	Company:	Date/Time:	Company:	Date/Time:
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	Arcadis	5-17-23 / 1330	Arcadis	5-17-23 / 1330	Arcadis	5-17-23 / 1330
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	ARCADIS	5/18/23 / 1245	EEBA	5/18/23 / 1245	EEBA	5/18/23 / 1245
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	EEBA	5/18/23 12:52	EE-TNC	5/19-23 800	EE-TNC	5/19-23 800



Eurofins - Canton Sample Receipt Form/Narrative
Barberton Facility

Login #: 185646

Client Arcadis Site Name

Cooler unpacked by:
Leah M. Smith

Cooler Received on 05-11-23 Opened on 05-19-23

FedEx: 1st Grd Exp UPS FAS (Chipped) Client Drop Off Eurofins Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

Eurofins Cooler # EC Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
IR GUN # (CF °C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

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

3. Shippers' packing slip attached to the cooler(s)? Yes No

4. Did custody papers accompany the sample(s)? Yes No

5. Were the custody papers relinquished & signed in the appropriate place? Yes No

6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No

7. Did all bottles arrive in good condition (Unbroken)? Yes No

8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No

9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?

10. Were correct bottle(s) used for the test(s) indicated? Yes No

11. Sufficient quantity received to perform indicated analyses? Yes No

12. Are these work share samples and all listed on the COC? Yes No

If yes, Questions 13-17 have been checked at the originating laboratory.

13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC208070

14. Were VOAs on the COC? Yes No

15. Were air bubbles >6 mm in any VOA vials? Larger than this. Yes No NA

16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Yes No

17. Was a LL Hg or Me Hg trip blank present? Yes No

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page

Samples processed by:

Blank lines for Chain of Custody and Sample Discrepancies.

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

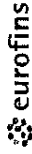
VOA Sample Preservation - Date/Time VOAs Frozen:

Eurofins - Canton Sample Receipt Multiple Cooler Form									
Cooler Description (Circle)				IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)		
EC	Client	Box	Other	IR GUN #: 22	0.8	0.8	Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #: 22	1.8	1.8	Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	
EC	Client	Box	Other	IR GUN #:			Wet Ice	Blue Ice	Dry Ice
EC	Client	Box	Other	IR GUN #:			Water	None	

See Temperature Excursion Form

Eurofins Cleveland
 180 S. Van Buren Avenue
 Barberton, OH 44203
 Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record



Environment Testing

Client Information (Sub Contract Lab)		Lab PM: DelMonico, Michael		Carrier Tracking No(s):		COC No: 240-185646-1							
Client Contact: Shipping/Receiving		E-Mail: Michael.DelMonico@et.eurofins.com		State of Origin: Michigan		Page: Page 1 of 1							
Company: Eurofins Environment Testing Northeast		Accreditations Required (See note):		Job #: 240-185646-1		Preservation Codes: M Hexane N None O AsNaO2 P Na2OAS Q Na2SO3 R Na2S2O3 S H2SO4 T TSP Dodecahydrate U Acetone V MCAA W pH 4-5 Y Trizma Z other (specify)							
Address: 777 New Durham Road, City: Edison State, Zip: NJ, 08817 Phone: 732-549-3900(Tel) 732-549-3679(Fax) Email:		Due Date Requested: 6/1/2023 TAT Requested (days): PO #: WO #: Project #: 24015353 SSDW#:		Analysis Requested Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> Perform M9M3D (Yes or No) <input checked="" type="checkbox"/> 8260D/5030C (MOD) VOCs (Short List) <input checked="" type="checkbox"/> 8260D_S1M/5030C (MOD) Local Method <input checked="" type="checkbox"/>				Total Number of Containers					
Project Name: Ford LTP Off Site Site:		Sample Date						Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=other, B=blank, A=Asst)	
Sample Identification - Client ID (Lab ID)		5/17/23		Eastern		Water		Water		X		1	
TRIP BLANK_126 (240-185646-1)		5/17/23		10:15 Eastern		Water		Water		X		18	
MW-72_051723 (240-185646-2)		5/17/23		10:15 Eastern		MS		Water		X		1	
MW-72-MS_051723 (240-185646-2MS)		5/17/23		10:15 Eastern		MSD		Water		X		1	
MW-72-MSD_051723 (240-185646-2MSD)		5/17/23		11:10 Eastern		Water		Water		X		6	
MW-72S_051723 (240-185646-3)		5/17/23		12:00 Eastern		Water		Water		X		6	
MW-73D_051723 (240-185646-4)		5/17/23		Eastern		Water		Water		X		6	

Possible Hazard Identification
 Unconfirmed Deliverable Requested. I, II, III, IV Other (specify) Primary Deliverable Rank: 2
 Empty Kit/Relinquished by: _____ Date: _____
 Relinquished by: _____ Date: 5/22/23 17:15
 Relinquished by: _____ Date: _____
 Relinquished by: _____ Date: _____
 Custody Seals Intact: _____ Custody Seal No. _____
 Δ Yes Δ No

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months
 Special Instructions/QC Requirements:

Method of Shipment: _____
 Received by: _____ Date/Time: 5-20-23 130 Company: FEA
 Resubmitted by: _____ Date/Time: _____ Company: _____
 Received by: _____ Date/Time: _____ Company: _____
 Cooled Temperatures and Other Remarks: 3.0cc BOC 3/26/23

Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 240-185646-1

Login Number: 185646

List Number: 2

Creator: Armbruster, Chris

List Source: Eurofins Edison

List Creation: 05/23/23 06:56 PM

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



DATA VERIFICATION REPORT



June 01, 2023

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: 30167538.402.04 off-site

Event Specific Scope of Work References: Sample COC

Laboratory: Eurofins Environment Testing LLC - Cleveland

Laboratory submittal: 185646-1

Sample date: 2023-05-17

Report received by CADENA: 2023-06-01

Initial Data Verification completed by CADENA: 2023-06-01

Number of Samples:4

Sample Matrices: Water and trip blank

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:

SUR - GCMS VOC surrogate recoveries were outside of laboratory control limits biased low but greater than 10% for at least 1 surrogate. These client sample results should be considered estimated and qualified with J flags if detected and UJ flags if non-detect: GCMS VOC sample -001 (trip blank) - UJ flags - all results.

SURROGATE recoveries were outside of laboratory control limits biased HIGH for 1 of 4 surrogates in the tests/samples noted. Associated results were either non-detect or detected below the RL so already qualified as estimated so qualification of field results was not required based on the high bias matrix QC outlier.
GCMS VOC sample -002.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, LCS/LCD RPD, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification. NOTE: CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify field sample results as part of this level 2 data package 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.

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

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

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

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

CADENA Valid Qualifiers

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

Qualified Results Summary

CADENA Project ID: E203631

Laboratory: Eurofins Environment Testing LLC - Cleveland

Laboratory Submittal: 185646-1

Sample Name: TRIP BLANK_126

Lab Sample ID: 2401856461

Sample Date: 5/17/2023

Analyte	Cas No.	Result	Report		Valid	
			Limit	Units	Qualifier	
GC/MS VOC						
<u>OSW-8260D</u>						
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	

Analytical Results Summary

CADENA Project ID: E203631

Laboratory: Eurofins Environment Testing LLC - Cleveland

Laboratory Submittal: 185646-1

Analyte	Cas No.	Sample Name: TRIP BLANK_126				MW-72_051723				MW-72S_051723				MW-73D_051723			
		Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier
		2401856461				2401856462				2401856463				2401856464			
		5/17/2023				5/17/2023				5/17/2023				5/17/2023			

GC/MS VOC

OSW-8260D

1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	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	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	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	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	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	UJ	0.75	1.0	ug/l	J	ND	1.0	ug/l	---	ND	1.0	ug/l	---

OSW-8260DSIM

1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	2.6	2.0	ug/l	---
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Ford Motor Company – Livonia Transmission Project

Data Review

Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG # 240-185646-1

CADENA Verification Report: 2023-06-01

Analyses Performed By:

Eurofins

North Canton, Ohio

Report # 49964R

Review Level: Tier III

Project: 30167538.402.02

DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-185646-1 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_126	240-185646-1	Water	05/17/23		X	
MW-72_051723	240-185646-2	Water	05/17/23		X	X
MW-72S_051723	240-185646-3	Water	05/17/23		X	X
MW-73D_051723	240-185646-4	Water	05/17/23		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 calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_126 MW-72_051723 MW-72S_051723 MW-73D_051723	Continuous Calibration Verification %D	Trichloroethene	-23.9%
MW-72_051723 MW-72S_051723 MW-73D_051723	Initial Calibration Verification %D	1,4-Dioxane	+28.1%
MW-72_051723 MW-72S_051723 MW-73D_051723	Continuous Calibration Verification %D	1,4-Dioxane	-22.3%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J

DATA REVIEW

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF <0.01 ¹	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01 ¹	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	UJ
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

¹RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

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

All internal standard responses were within control limits.

5. Field Duplicate Analysis

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

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

6. Compound Identification

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: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: June 19, 2023

PEER REVIEW: Andrew Korycinski

DATE: June 21, 2023

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

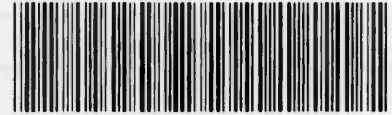


Chain of Custody Record

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

Client Contact		Regulatory program: <input type="checkbox"/> DW <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> Other	
Company Name: Arcadis		TestAmerica Laboratories, Inc.	
Address: 28550 Cabot Drive, Suite 500		Client Project Manager: Kris Hinskey	Site Contact: Christina Weaver
City/State/Zip: Novi, MI, 48377		Telephone: 248-994-2240	Telephone: 248-994-2240
Phone: 248-994-2240		Telephone: 330-497-9396	
Project Name: Ford LTP Off-Site		Analysis Turnaround Time	
Project Number: 30167538.402.04		TAT if different from below	
PO # 30167538.402.04		<input checked="" type="checkbox"/> 10 day <input type="checkbox"/> 3 weeks <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day	
Email: kristoffer.hinskey@arcadis.com		Analyses	
Sampler Name: JOE FOSTIK		Filtered Sample (V / N) Composite=C / Grab=G 1,1-DCE 8260B cis-1,2-DCE 8260B Trans-1,2-DCE 8260B PCE 8260B TCE 8260B Vinyl Chloride 8260B 1,4-Dioxane 8260B SIM	
Method of Shipment/Carrier:			
Shipping/Tracking No:		Walk-in client Lab sampling Job/SDG No:	
Sample Identification			
Sample Date	Sample Time	Matrix	
		Air	Aqueous
		Sediment	Solid
		Other:	Other:
		Containers & Preservatives	
		H2SO4	HNO3
		HCl	NaOH
		ZnAc	NaOH
		Unpres	Other:
		Sample Specific Notes / Special Instructions:	

Sample Identification	Sample Date	Sample Time	Air	Aqueous	Sediment	Solid	Other:	H2SO4	HNO3	HCl	NaOH	ZnAc	NaOH	Unpres	Other:	Filtered Sample (V / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 126	---	---	1							1						NG	X	X	X	X	X	X			1 Trip Blank
MW-72_051723	5-17-23	1015	6							6						NG	X	X	X	X	X	X	X		3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-72-MS_051723	5-17-23	1015	6							6						NG	X	X	X	X	X	X	X		
MW-72-MSD_051723	5-17-23	1015	6							6						NG	X	X	X	X	X	X	X		
MW-725_051723	5-17-23	1110	6							6						NG	X	X	X	X	X	X	X		
MW-730_051723	5-17-23	1200	6							6						NG	X	X	X	X	X	X	X		



240-185646 Chain of Custody

MICHIGAN
190

Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown		<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	

Special Instructions/QC Requirements & Comments:
 Sample Address: **BELDEN ROW**
 Submit all results through Cadena at jtomalia@cadenco.com. Cadena #E203631
 Level IV Reporting requested.

Relinquished by: <i>[Signature]</i>	Company: Arcadis	Date/Time: 5-17-23 / 1330	Received by: <i>[Signature]</i>	Company: Arcadis	Date/Time: 5-17-23 / 1330
Relinquished by: <i>[Signature]</i>	Company: ARCADIS	Date/Time: 5/18/23 / 1245	Received by: <i>[Signature]</i>	Company: EETA	Date/Time: 5/18/23 / 1245
Relinquished by: <i>[Signature]</i>	Company: EETA	Date/Time: 5/18/23 12:52	Received in Laboratory by: Leah M. Smith	Company: EETNC	Date/Time: 05-19-23 800

Client Sample Results

Client: ARCADIS US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Client Sample ID: TRIP BLANK_126

Lab Sample ID: 240-185646-1

Date Collected: 05/17/23 00:00

Matrix: Water

Date Received: 05/19/23 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			05/27/23 18:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/27/23 18:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 18:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/27/23 18:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 18:46	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/27/23 18:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		70 - 128		05/27/23 18:46	1
Dibromofluoromethane (Surr)	100		77 - 124		05/27/23 18:46	1
Toluene-d8 (Surr)	79	S1-	80 - 120		05/27/23 18:46	1
4-Bromofluorobenzene	104		76 - 120		05/27/23 18:46	1

Client Sample ID: MW-72_051723

Lab Sample ID: 240-185646-2

Date Collected: 05/17/23 10:15

Matrix: Water

Date Received: 05/19/23 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			05/24/23 10:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	96		75 - 133		05/24/23 10:02	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			05/27/23 20:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/27/23 20:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 20:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/27/23 20:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 20:17	1
Vinyl chloride	0.75	J	1.0	0.45	ug/L			05/27/23 20:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		70 - 128		05/27/23 20:17	1
Dibromofluoromethane (Surr)	104		77 - 124		05/27/23 20:17	1
Toluene-d8 (Surr)	108		80 - 120		05/27/23 20:17	1
4-Bromofluorobenzene	125	S1+	76 - 120		05/27/23 20:17	1

Client Sample ID: MW-72S_051723

Lab Sample ID: 240-185646-3

Date Collected: 05/17/23 11:10

Matrix: Water

Date Received: 05/19/23 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			05/24/23 10:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	96		75 - 133		05/24/23 10:24	1

Client Sample Results

Client: ARCADIS US Inc
Project/Site: Ford LTP - Off Site

Job ID: 240-185646-1

Client Sample ID: MW-72S_051723

Lab Sample ID: 240-185646-3

Date Collected: 05/17/23 11:10

Matrix: Water

Date Received: 05/19/23 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			05/27/23 21:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/27/23 21:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 21:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/27/23 21:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 21:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/27/23 21:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	94		70 - 128		05/27/23 21:02	1
Dibromofluoromethane (Surr)	107		77 - 124		05/27/23 21:02	1
Toluene-d8 (Surr)	90		80 - 120		05/27/23 21:02	1
4-Bromofluorobenzene	109		76 - 120		05/27/23 21:02	1

Client Sample ID: MW-73D_051723

Lab Sample ID: 240-185646-4

Date Collected: 05/17/23 12:00

Matrix: Water

Date Received: 05/19/23 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	2.6	J	2.0	0.86	ug/L			05/24/23 10:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	96		75 - 133		05/24/23 10:45	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			05/27/23 21:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			05/27/23 21:25	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 21:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			05/27/23 21:25	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			05/27/23 21:25	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			05/27/23 21:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		70 - 128		05/27/23 21:25	1
Dibromofluoromethane (Surr)	107		77 - 124		05/27/23 21:25	1
Toluene-d8 (Surr)	104		80 - 120		05/27/23 21:25	1
4-Bromofluorobenzene	111		76 - 120		05/27/23 21:25	1