

12/26/2018
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #: MI001454.0003
Workorder #: 1812359

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 12/17/2018 at Air Toxics Ltd.

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

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

Regards,



Ausha Scott
Project Manager

WORK ORDER #: 1812359

Work Order Summary

CLIENT:	Mr. Jim Tomalia Arcadis U.S., Inc. 28550 Cabot Dr. Suite 500 Novi, MI 48377	BILL TO:	Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129
PHONE:	517-819-0356	P.O. #	MI001454.0004.0001B
FAX:		PROJECT #	MI001454.0003 Ford LTP
DATE RECEIVED:	12/17/2018	CONTACT:	Ausha Scott
DATE COMPLETED:	12/26/2018		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	SSMP-35000Plymouth-01_121318	TO-15	3.5 "Hg	14.8 psi
02A	SSMP-35000Plymouth-02_121318	TO-15	4.7 "Hg	15 psi
03A	SSMP-35000Plymouth-03_121318	TO-15	2.8 "Hg	14.9 psi
04A	SSMP-35000Plymouth-04_121318	TO-15	3.9 "Hg	15.1 psi
05A	SSMP-35000Plymouth-05_121318	TO-15	5.5 "Hg	14.7 psi
06A	Lab Blank	TO-15	NA	NA
07A	CCV	TO-15	NA	NA
08A	LCS	TO-15	NA	NA
08AA	LCSD	TO-15	NA	NA

CERTIFIED BY: 

 Technical Director

DATE: 12/26/18

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
 TX NELAP - T104704434-15-9, UT NELAP CA0093332015-6, VA NELAP - 8113, WA NELAP - C935
 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
 Accreditation number: CA300005, Effective date: 10/18/2015, Expiration date: 10/17/2016.

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

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

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
 (916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
Arcadis U.S., Inc.
Workorder# 1812359

Five 1 Liter Summa Canister samples were received on December 17, 2018. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified (0.2 ppbv for compounds reported at 0.5 ppbv and 0.8 ppbv for compounds reported at 2.0 ppbv) may be false positives.

Definition of Data Qualifying Flags

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

- B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
- J - Estimated value.
- E - Exceeds instrument calibration range.
- S - Saturated peak.
- Q - Exceeds quality control limits.
- U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.
- UJ- Non-detected compound associated with low bias in the CCV
- N - The identification is based on presumptive evidence.
- M - Reported value may be biased due to apparent matrix interferences.
- CN - See Case Narrative.

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

- a-File was requantified
- b-File was quantified by a second column and detector
- r1-File was requantified for the purpose of reissue

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

Client ID:	SSMP-35000Plymouth-01_121318	Date/Time Analyzed:	12/22/18 01:00 AM
Lab ID:	1812359-01A	Dilution Factor:	2.27
Date/Time Collected:	12/13/18 09:25 AM	Instrument/Filename:	msdp.i / p122123
Media:	1 Liter Summa Canister		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.7	4.0	4.5	Not Detected
1,4-Dioxane	123-91-1	2.2	11	16	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.0	4.0	4.5	Not Detected
Tetrachloroethene	127-18-4	1.4	6.9	7.7	17
trans-1,2-Dichloroethene	156-60-5	2.8	4.0	4.5	Not Detected
Trichloroethene	79-01-6	0.80	5.5	6.1	Not Detected
Vinyl Chloride	75-01-4	0.69	2.6	2.9	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	100
4-Bromofluorobenzene	460-00-4	70-130	101
Toluene-d8	2037-26-5	70-130	98

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

Client ID:	SSMP-35000Plymouth-02_121318	Date/Time Analyzed:	12/22/18 12:34 AM
Lab ID:	1812359-02A	Dilution Factor:	2.40
Date/Time Collected:	12/13/18 09:40 AM	Instrument/Filename:	msdp.i / p122122
Media:	1 Liter Summa Canister		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.8	4.3	4.8	Not Detected
1,4-Dioxane	123-91-1	2.3	12	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.2	4.3	4.8	Not Detected
Tetrachloroethene	127-18-4	1.5	7.3	8.1	6.5 J
trans-1,2-Dichloroethene	156-60-5	2.9	4.3	4.8	Not Detected
Trichloroethene	79-01-6	0.85	5.8	6.4	Not Detected
Vinyl Chloride	75-01-4	0.73	2.8	3.1	Not Detected

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	102
4-Bromofluorobenzene	460-00-4	70-130	102
Toluene-d8	2037-26-5	70-130	99

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

Client ID:	SSMP-35000Plymouth-03_121318	Date/Time Analyzed:	12/22/18 12:07 AM
Lab ID:	1812359-03A	Dilution Factor:	2.22
Date/Time Collected:	12/13/18 10:15 AM	Instrument/Filename:	msdp.i / p122121
Media:	1 Liter Summa Canister		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.7	4.0	4.4	Not Detected
1,4-Dioxane	123-91-1	2.1	11	16	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.0	4.0	4.4	Not Detected
Tetrachloroethene	127-18-4	1.4	6.8	7.5	11
trans-1,2-Dichloroethene	156-60-5	2.7	4.0	4.4	Not Detected
Trichloroethene	79-01-6	0.78	5.4	6.0	Not Detected
Vinyl Chloride	75-01-4	0.68	2.5	2.8	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	102
4-Bromofluorobenzene	460-00-4	70-130	99
Toluene-d8	2037-26-5	70-130	98

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

Client ID:	SSMP-35000Plymouth-04_121318	Date/Time Analyzed:	12/21/18 11:41 PM
Lab ID:	1812359-04A	Dilution Factor:	2.33
Date/Time Collected:	12/13/18 11:07 AM	Instrument/Filename:	msdp.i / p122120
Media:	1 Liter Summa Canister		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.8	4.1	4.6	Not Detected
1,4-Dioxane	123-91-1	2.2	12	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.1	4.1	4.6	Not Detected
Tetrachloroethene	127-18-4	1.5	7.1	7.9	27
trans-1,2-Dichloroethene	156-60-5	2.9	4.1	4.6	Not Detected
Trichloroethene	79-01-6	0.82	5.6	6.3	Not Detected
Vinyl Chloride	75-01-4	0.71	2.7	3.0	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	100
4-Bromofluorobenzene	460-00-4	70-130	103
Toluene-d8	2037-26-5	70-130	96

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

Client ID:	SSMP-35000Plymouth-05_121318	Date/Time Analyzed:	12/21/18 11:15 PM
Lab ID:	1812359-05A	Dilution Factor:	2.45
Date/Time Collected:	12/13/18 09:50 AM	Instrument/Filename:	msdp.i / p122119
Media:	1 Liter Summa Canister		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.8	4.4	4.8	Not Detected
1,4-Dioxane	123-91-1	2.3	12	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.2	4.4	4.8	Not Detected
Tetrachloroethene	127-18-4	1.6	7.5	8.3	Not Detected
trans-1,2-Dichloroethene	156-60-5	3.0	4.4	4.8	Not Detected
Trichloroethene	79-01-6	0.86	5.9	6.6	Not Detected
Vinyl Chloride	75-01-4	0.74	2.8	3.1	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	98
4-Bromofluorobenzene	460-00-4	70-130	96
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	Lab Blank	Date/Time Analyzed:	12/21/18 11:48 AM
Lab ID:	1812359-06A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdp.i / p122105a
Media:	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.75	1.8	2.0	Not Detected
1,4-Dioxane	123-91-1	0.95	5.0	7.2	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.90	1.8	2.0	Not Detected
Tetrachloroethene	127-18-4	0.64	3.0	3.4	Not Detected
trans-1,2-Dichloroethene	156-60-5	1.2	1.8	2.0	Not Detected
Trichloroethene	79-01-6	0.35	2.4	2.7	Not Detected
Vinyl Chloride	75-01-4	0.30	1.1	1.3	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	98
4-Bromofluorobenzene	460-00-4	70-130	94
Toluene-d8	2037-26-5	70-130	97

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

Client ID:	CCV	Date/Time Analyzed:	12/21/18 10:32 AM
Lab ID:	1812359-07A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdp.i / p122102
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	106
1,4-Dioxane	123-91-1	100
cis-1,2-Dichloroethene	156-59-2	108
Tetrachloroethene	127-18-4	118
trans-1,2-Dichloroethene	156-60-5	116
Trichloroethene	79-01-6	106
Vinyl Chloride	75-01-4	118

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	105
4-Bromofluorobenzene	460-00-4	70-130	107
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	LCS	Date/Time Analyzed:	12/21/18 10:56 AM
Lab ID:	1812359-08A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdp.i / p122103
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	97
1,4-Dioxane	123-91-1	105
cis-1,2-Dichloroethene	156-59-2	87
Tetrachloroethene	127-18-4	109
trans-1,2-Dichloroethene	156-60-5	111
Trichloroethene	79-01-6	102
Vinyl Chloride	75-01-4	112

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	103
4-Bromofluorobenzene	460-00-4	70-130	103
Toluene-d8	2037-26-5	70-130	100

* % Recovery is calculated using unrounded analytical results.

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

Client ID:	LCSD	Date/Time Analyzed:	12/21/18 11:21 AM
Lab ID:	1812359-08AA	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdp.i / p122104
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	101
1,4-Dioxane	123-91-1	109
cis-1,2-Dichloroethene	156-59-2	91
Tetrachloroethene	127-18-4	110
trans-1,2-Dichloroethene	156-60-5	113
Trichloroethene	79-01-6	103
Vinyl Chloride	75-01-4	115

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	103
4-Bromofluorobenzene	460-00-4	70-130	107
Toluene-d8	2037-26-5	70-130	100

* % Recovery is calculated using unrounded analytical results.



December 27, 2018

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: MI001454.0002/3/4.00002/2B/3B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics - Folsom
Laboratory submittal: 1812359
Sample date: 2018-12-13
Report received by CADENA: 2018-12-26
Initial Data Verification completed by CADENA: 2018-12-27

5 Air samples were analyzed for TO-15 parameters.

There were no significant QC anomalies or exceptions to report.

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

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

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

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

CADENA Valid Qualifiers

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

12/22/2018
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #: MI001454.0003
Workorder #: 1812360

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 12/17/2018 at Air Toxics Ltd.

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

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

Regards,



Ausha Scott
Project Manager

WORK ORDER #: 1812360

Work Order Summary

CLIENT:	Mr. Jim Tomalia Arcadis U.S., Inc. 28550 Cabot Dr. Suite 500 Novi, MI 48377	BILL TO:	Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129
PHONE:	517-819-0356	P.O. #	MI001454.0004.0001B
FAX:		PROJECT #	MI001454.0003 Ford LTP
DATE RECEIVED:	12/17/2018	CONTACT:	Ausha Scott
DATE COMPLETED:	12/22/2018		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	IA-35000Plymouth-01_121318	Modified TO-15	4.7 "Hg	5.1 psi
01B	IA-35000Plymouth-01_121318	Modified TO-15	4.7 "Hg	5.1 psi
02A	IA-35000Plymouth-02_121318	Modified TO-15	4.5 "Hg	4.8 psi
02B	IA-35000Plymouth-02_121318	Modified TO-15	4.5 "Hg	4.8 psi
03A	IA-35000Plymouth-03_121318	Modified TO-15	4.7 "Hg	5.2 psi
03B	IA-35000Plymouth-03_121318	Modified TO-15	4.7 "Hg	5.2 psi
04A	IA-35000Plymouth-04_121318	Modified TO-15	4.3 "Hg	5.2 psi
04B	IA-35000Plymouth-04_121318	Modified TO-15	4.3 "Hg	5.2 psi
05A	IA-35000Plymouth-05_121318	Modified TO-15	5.5 "Hg	4.5 psi
05B	IA-35000Plymouth-05_121318	Modified TO-15	5.5 "Hg	4.5 psi
06A	AA-35000Plymouth-01_121318	Modified TO-15	3.3 "Hg	4.9 psi
07A	Lab Blank	Modified TO-15	NA	NA
07B	Lab Blank	Modified TO-15	NA	NA
08A	CCV	Modified TO-15	NA	NA
08B	CCV	Modified TO-15	NA	NA
09A	LCS	Modified TO-15	NA	NA
09AA	LCSD	Modified TO-15	NA	NA
09B	LCS	Modified TO-15	NA	NA
09BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: 
 Technical Director

DATE: 12/22/18

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
 TX NELAP - T104704434-15-9, UT NELAP CA0093332015-6, VA NELAP - 8113, WA NELAP - C935
 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
 Accreditation number: CA300005, Effective date: 10/18/2015, Expiration date: 10/17/2016.

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

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

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 (916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE
Modified TO-15 Full Scan/SIM
Arcadis U.S., Inc.
Workorder# 1812360**

Six 6 Liter Summa Canister (100% Certified) samples were received on December 17, 2018. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the Full Scan and SIM acquisition modes. The method involves concentrating up to 1.0 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

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

<i>Requirement</i>	<i>TO-15</i>	<i>ATL Modifications</i>
ICAL %RSD acceptance criteria	$\leq 30\%$ RSD with 2 compounds allowed out to <math>< 40\%</math> RSD	For Full Scan: 30% RSD with 4 compounds allowed out to <math>< 40\%</math> RSD For SIM: Project specific; default criteria is $\leq 30\%$ RSD with 10% of compounds allowed out to <math>< 40\%</math> RSD
Daily Calibration	+/- 30% Difference	For Full Scan: $\leq 30\%$ Difference with four allowed out up to $\leq 40\%$; flag and narrate outliers For SIM: Project specific; default criteria is $\leq 30\%$ Difference with 10% of compounds allowed out up to $\leq 40\%$; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

The results for samples IA-35000Plymouth-01_121318, IA-35000Plymouth-02_121318, IA-35000Plymouth-03_121318, IA-35000Plymouth-04_121318 and IA-35000Plymouth-05_121318 in this report were acquired from two separate data files originating from the same analytical run. The two data files have the same base file name and are differentiated with a "sim" extension on the SIM data file.

Dilution was performed on samples IA-35000Plymouth-01_121318, IA-35000Plymouth-02_121318, IA-35000Plymouth-03_121318, IA-35000Plymouth-04_121318 and IA-35000Plymouth-05_121318 due to the presence of high level non-target species.

As per project specific client request the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. All The canisters used for this project have been certified to the Reporting Limit for the target analytes included in this workorder. Concentrations that are below the level at which the canister was certified may be false positives.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

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

N - The identification is based on presumptive evidence.

CN - See case narrative explanation

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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

Client ID:	IA-35000Plymouth-01_121318	Date/Time Analyzed:	12/19/18 04:20 PM
Lab ID:	1812360-01A	Dilution Factor:	16.0
Date/Time Collected:	12/13/18 08:03 PM	Instrument/Filename:	msd20.i / 20121911
Media:	6 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	3.3	5.7	6.3	Not Detected
1,4-Dioxane	123-91-1	4.4	5.2	5.8	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.6	5.7	6.3	Not Detected
Tetrachloroethene	127-18-4	6.1	9.8	11	Not Detected
trans-1,2-Dichloroethene	156-60-5	4.0	5.7	6.3	Not Detected
Vinyl Chloride	75-01-4	2.4	3.7	4.1	Not Detected

D: Analyte not within the DoD scope of accreditation.

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

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

Client ID:	IA-35000Plymouth-01_121318	Date/Time Analyzed:	12/19/18 04:20 PM
Lab ID:	1812360-01B	Dilution Factor:	16.0
Date/Time Collected:	12/13/18 08:03 PM	Instrument/Filename:	msd20.i / 20121911sim
Media:	6 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.10	0.69	1.7	0.30 J

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	92
4-Bromofluorobenzene	460-00-4	70-130	101
Toluene-d8	2037-26-5	70-130	98

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

Client ID:	IA-35000Plymouth-02_121318	Date/Time Analyzed:	12/19/18 04:59 PM
Lab ID:	1812360-02A	Dilution Factor:	15.6
Date/Time Collected:	12/13/18 08:05 PM	Instrument/Filename:	msd20.i / 20121912
Media:	6 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	3.2	5.6	6.2	Not Detected
1,4-Dioxane	123-91-1	4.3	5.0	5.6	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.5	5.6	6.2	Not Detected
Tetrachloroethene	127-18-4	6.0	9.5	10	Not Detected
trans-1,2-Dichloroethene	156-60-5	3.9	5.6	6.2	Not Detected
Vinyl Chloride	75-01-4	2.3	3.6	4.0	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	96
4-Bromofluorobenzene	460-00-4	70-130	101
Toluene-d8	2037-26-5	70-130	99

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

Client ID:	IA-35000Plymouth-02_121318	Date/Time Analyzed:	12/19/18 04:59 PM
Lab ID:	1812360-02B	Dilution Factor:	15.6
Date/Time Collected:	12/13/18 08:05 PM	Instrument/Filename:	msd20.i / 20121912sim
Media:	6 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.10	0.67	1.7	0.59 J

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	92
4-Bromofluorobenzene	460-00-4	70-130	101
Toluene-d8	2037-26-5	70-130	98

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

Client ID:	IA-35000Plymouth-03_121318	Date/Time Analyzed:	12/19/18 05:38 PM
Lab ID:	1812360-03A	Dilution Factor:	16.0
Date/Time Collected:	12/13/18 08:07 PM	Instrument/Filename:	msd20.i / 20121913
Media:	6 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	3.3	5.7	6.3	Not Detected
1,4-Dioxane	123-91-1	4.4	5.2	5.8	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.6	5.7	6.3	Not Detected
Tetrachloroethene	127-18-4	6.1	9.8	11	Not Detected
trans-1,2-Dichloroethene	156-60-5	4.0	5.7	6.3	Not Detected
Vinyl Chloride	75-01-4	2.4	3.7	4.1	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	95
4-Bromofluorobenzene	460-00-4	70-130	98
Toluene-d8	2037-26-5	70-130	99

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

Client ID:	IA-35000Plymouth-03_121318	Date/Time Analyzed:	12/19/18 05:38 PM
Lab ID:	1812360-03B	Dilution Factor:	16.0
Date/Time Collected:	12/13/18 08:07 PM	Instrument/Filename:	msd20.i / 20121913sim
Media:	6 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.10	0.69	1.7	0.71 J

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	91
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	97

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

Client ID:	IA-35000Plymouth-04_121318	Date/Time Analyzed:	12/19/18 06:17 PM
Lab ID:	1812360-04A	Dilution Factor:	15.8
Date/Time Collected:	12/13/18 08:08 PM	Instrument/Filename:	msd20.i / 20121914
Media:	6 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	3.3	5.6	6.3	Not Detected
1,4-Dioxane	123-91-1	4.3	5.1	5.7	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.6	5.6	6.3	Not Detected
Tetrachloroethene	127-18-4	6.0	9.6	11	Not Detected
trans-1,2-Dichloroethene	156-60-5	4.0	5.6	6.3	Not Detected
Vinyl Chloride	75-01-4	2.3	3.6	4.0	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	89
4-Bromofluorobenzene	460-00-4	70-130	102
Toluene-d8	2037-26-5	70-130	99

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

Client ID:	IA-35000Plymouth-04_121318	Date/Time Analyzed:	12/19/18 06:17 PM
Lab ID:	1812360-04B	Dilution Factor:	15.8
Date/Time Collected:	12/13/18 08:08 PM	Instrument/Filename:	msd20.i / 20121914sim
Media:	6 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.10	0.68	1.7	0.39 J

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	91
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	97

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

Client ID:	IA-35000Plymouth-05_121318	Date/Time Analyzed:	12/19/18 06:56 PM
Lab ID:	1812360-05A	Dilution Factor:	16.0
Date/Time Collected:	12/13/18 08:09 PM	Instrument/Filename:	msd20.i / 20121915
Media:	6 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	3.3	5.7	6.3	Not Detected
1,4-Dioxane	123-91-1	4.4	5.2	5.8	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.6	5.7	6.3	Not Detected
Tetrachloroethene	127-18-4	6.1	9.8	11	Not Detected
trans-1,2-Dichloroethene	156-60-5	4.0	5.7	6.3	Not Detected
Vinyl Chloride	75-01-4	2.4	3.7	4.1	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	89
4-Bromofluorobenzene	460-00-4	70-130	97
Toluene-d8	2037-26-5	70-130	99

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

Client ID:	IA-35000Plymouth-05_121318	Date/Time Analyzed:	12/19/18 06:56 PM
Lab ID:	1812360-05B	Dilution Factor:	16.0
Date/Time Collected:	12/13/18 08:09 PM	Instrument/Filename:	msd20.i / 20121915sim
Media:	6 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.10	0.69	1.7	0.30 J

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	91
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	97

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

Client ID:	AA-35000Plymouth-01_121318	Date/Time Analyzed:	12/19/18 07:35 PM
Lab ID:	1812360-06A	Dilution Factor:	1.50
Date/Time Collected:	12/13/18 08:16 PM	Instrument/Filename:	msd20.i / 20121916
Media:	6 Liter Summa Canister (100% Certified)		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.31	0.54	0.59	Not Detected
1,4-Dioxane	123-91-1	0.41	0.49	0.54	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.24	0.54	0.59	Not Detected
Tetrachloroethene	127-18-4	0.58	0.92	1.0	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.38	0.54	0.59	0.84
Trichloroethene	79-01-6	0.31	0.72	0.81	Not Detected
Vinyl Chloride	75-01-4	0.22	0.34	0.38	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	110
4-Bromofluorobenzene	460-00-4	70-130	99
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	Lab Blank	Date/Time Analyzed:	12/19/18 12:52 PM
Lab ID:	1812360-07A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20121907a
Media:	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.21	0.36	0.40	Not Detected
1,4-Dioxane	123-91-1	0.27	0.32	0.36	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.16	0.36	0.40	Not Detected
Tetrachloroethene	127-18-4	0.38	0.61	0.68	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.25	0.36	0.40	Not Detected
Trichloroethene	79-01-6	0.21	0.48	0.54	Not Detected
Vinyl Chloride	75-01-4	0.15	0.23	0.26	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	102
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	Lab Blank	Date/Time Analyzed:	12/19/18 12:52 PM
Lab ID:	1812360-07B	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20121907sima
Media:	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.0064	0.043	0.11	0.013 J

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	100
4-Bromofluorobenzene	460-00-4	70-130	102
Toluene-d8	2037-26-5	70-130	98

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

Client ID:	CCV	Date/Time Analyzed:	12/19/18 08:27 AM
Lab ID:	1812360-08A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20121902
Media:	NA - Not Applicable		

Compound	CAS#		%Recovery
1,1-Dichloroethene	75-35-4		92
1,4-Dioxane	123-91-1		101
cis-1,2-Dichloroethene	156-59-2		94
Tetrachloroethene	127-18-4		100
trans-1,2-Dichloroethene	156-60-5		95
Trichloroethene	79-01-6		101
Vinyl Chloride	75-01-4		94

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	96
4-Bromofluorobenzene	460-00-4	70-130	101
Toluene-d8	2037-26-5	70-130	99

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

Client ID:	CCV	Date/Time Analyzed:	12/19/18 08:27 AM
Lab ID:	1812360-08B	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20121902sim
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
Trichloroethene	79-01-6	97

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	90
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	99

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

Client ID:	LCS	Date/Time Analyzed:	12/19/18 09:20 AM
Lab ID:	1812360-09A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20121903
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	93
1,4-Dioxane	123-91-1	102
cis-1,2-Dichloroethene	156-59-2	88
Tetrachloroethene	127-18-4	98
trans-1,2-Dichloroethene	156-60-5	107
Trichloroethene	79-01-6	112
Vinyl Chloride	75-01-4	98

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	92
4-Bromofluorobenzene	460-00-4	70-130	101
Toluene-d8	2037-26-5	70-130	101

* % Recovery is calculated using unrounded analytical results.

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

Client ID:	LCSD	Date/Time Analyzed:	12/19/18 10:58 AM
Lab ID:	1812360-09AA	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20121905
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	89
1,4-Dioxane	123-91-1	101
cis-1,2-Dichloroethene	156-59-2	87
Tetrachloroethene	127-18-4	99
trans-1,2-Dichloroethene	156-60-5	103
Trichloroethene	79-01-6	109
Vinyl Chloride	75-01-4	97

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	91
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	100

* % Recovery is calculated using unrounded analytical results.

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

Client ID:	LCS	Date/Time Analyzed:	12/19/18 09:20 AM
Lab ID:	1812360-09B	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20121903sim
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
Trichloroethene	79-01-6	107

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	89
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	99

* % Recovery is calculated using unrounded analytical results.

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

Client ID:	LCSD	Date/Time Analyzed:	12/19/18 10:58 AM
Lab ID:	1812360-09BB	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msd20.i / 20121905sim
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
Trichloroethene	79-01-6	106

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	89
4-Bromofluorobenzene	460-00-4	70-130	101
Toluene-d8	2037-26-5	70-130	99

* % Recovery is calculated using unrounded analytical results.



December 24, 2018

Kris Hinskey
Arcadis Inc
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Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: MI001454.0002/3/4.00002/2B/3B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics - Folsom
Laboratory submittal: 1812360
Sample date: 2018-12-13
Report received by CADENA: 2018-12-22
Initial Data Verification completed by CADENA: 2018-12-24

6 Air samples were analyzed for TO-15 parameters.

The following minor QC exceptions or missing information were noted:

MBK - METHOD BLANKS had detections BELOW the Reporting Limit (RL) for these analytes. The listed client sample results had concentrations LESS than 5X the method blank levels so client sample results reported below the RL are considered non-detect at the RL and qualified with UB flags and results greater than the RL are non-detect at the sample concentration reported and qualified with B flags :
TO-15 QC batch - TRICHLOROETHYLENE - UB flags - samples -001, -002, -003, -004, -005.

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

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

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

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

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

CADENA Valid Qualifiers

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