

11/30/2018  
Mr. Jim Tomalia  
Arcadis U.S., Inc.  
28550 Cabot Dr.  
Suite 500  
Novi MI 48377

Project Name: Ford LTP  
Project #:  
Workorder #: 1811483

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 11/21/2018 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 #: 1811483**

Work Order Summary

<b>CLIENT:</b>	Mr. Jim Tomalia Arcadis U.S., Inc. 28550 Cabot Dr. Suite 500 Novi, MI 48377	<b>BILL TO:</b>	Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129
<b>PHONE:</b>	517-819-0356	<b>P.O. #</b>	MI001454.0003
<b>FAX:</b>		<b>PROJECT #</b>	Ford LTP
<b>DATE RECEIVED:</b>	11/21/2018	<b>CONTACT:</b>	Ausha Scott
<b>DATE COMPLETED:</b>	11/30/2018		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	AA-11898Belden-01_111918	Modified TO-15	5.3 "Hg	4.9 psi
02A	IA-11898Belden-01_111918	Modified TO-15	6.7 "Hg	4.6 psi
03A	IA-11898Belden-02_111918	Modified TO-15	5.5 "Hg	4.9 psi
04A	IA-11898Belden-03_111918	Modified TO-15	5.3 "Hg	4.9 psi
05A	IA-11898Belden-04_111918	Modified TO-15	4.5 "Hg	5.1 psi
06A	Lab Blank	Modified TO-15	NA	NA
06B	Lab Blank	Modified TO-15	NA	NA
07A	CCV	Modified TO-15	NA	NA
07B	CCV	Modified TO-15	NA	NA
08A	LCS	Modified TO-15	NA	NA
08AA	LCSD	Modified TO-15	NA	NA
08B	LCS	Modified TO-15	NA	NA
08BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY:   
 Technical Director

DATE: 11/30/18

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

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

**LABORATORY NARRATIVE**  
**Modified TO-15**  
**Arcadis U.S., Inc.**  
**Workorder# 1811483**

Five 6 Liter Summa Canister (100% Certified) samples were received on November 21, 2018. The laboratory performed analysis via modified 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.

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

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

As per 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.

Samples IA-11898Belden-02\_111918, IA-11898Belden-03\_111918 and IA-11898Belden-04\_111918 were transferred from Low Level analysis to full scan TO-15 due to high levels of non-target compounds.

Dilution was performed on samples IA-11898Belden-01\_111918, IA-11898Belden-02\_111918, IA-11898Belden-03\_111918 and IA-11898Belden-04\_111918 due to the presence of high level non-target species.

**Definition of Data Qualifying Flags**

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

- B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
- J - Estimated value.
- E - Exceeds instrument calibration range.
- S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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

<b>Client ID:</b>	AA-11898Belden-01_111918	<b>Date/Time Analyzed:</b>	11/27/18 05:00 PM
<b>Lab ID:</b>	1811483-01A	<b>Dilution Factor:</b>	1.62
<b>Date/Time Collected:</b>	11/19/18 03:20 PM	<b>Instrument/Filename:</b>	msd20.i / 20112711
<b>Media:</b>	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	0.34	0.58	0.64	Not Detected
1,4-Dioxane	123-91-1	0.44	0.52	0.58	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.26	0.58	0.64	Not Detected
Tetrachloroethene	127-18-4	0.62	0.99	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.41	0.58	0.64	Not Detected
Trichloroethene	79-01-6	0.34	0.78	0.87	Not Detected
Vinyl Chloride	75-01-4	0.24	0.37	0.41	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	87
4-Bromofluorobenzene	460-00-4	70-130	113
Toluene-d8	2037-26-5	70-130	93

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

<b>Client ID:</b>	IA-11898Belden-01_111918	<b>Date/Time Analyzed:</b>	11/27/18 05:40 PM
<b>Lab ID:</b>	1811483-02A	<b>Dilution Factor:</b>	16.9
<b>Date/Time Collected:</b>	11/19/18 03:15 PM	<b>Instrument/Filename:</b>	msd20.i / 20112712
<b>Media:</b>	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	3.5	6.0	6.7	Not Detected
1,4-Dioxane	123-91-1	4.6	5.5	6.1	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.7	6.0	6.7	Not Detected
Tetrachloroethene	127-18-4	6.5	10	11	Not Detected
trans-1,2-Dichloroethene	156-60-5	4.2	6.0	6.7	Not Detected
Trichloroethene	79-01-6	3.5	8.2	9.1	Not Detected
Vinyl Chloride	75-01-4	2.5	3.9	4.3	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	75
4-Bromofluorobenzene	460-00-4	70-130	108
Toluene-d8	2037-26-5	70-130	94

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

<b>Client ID:</b>	IA-11898Belden-02_111918	<b>Date/Time Analyzed:</b>	11/29/18 05:37 PM
<b>Lab ID:</b>	1811483-03A	<b>Dilution Factor:</b>	32.6
<b>Date/Time Collected:</b>	11/19/18 03:04 PM	<b>Instrument/Filename:</b>	msd17.i / 17112911
<b>Media:</b>	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	28	52	65	Not Detected
1,4-Dioxane	123-91-1	52	180	230	Not Detected
cis-1,2-Dichloroethene	156-59-2	10	52	65	Not Detected
Tetrachloroethene	127-18-4	15	88	110	Not Detected
trans-1,2-Dichloroethene	156-60-5	19	52	65	Not Detected
Trichloroethene	79-01-6	33	70	88	Not Detected
Vinyl Chloride	75-01-4	10	33	42	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	93
4-Bromofluorobenzene	460-00-4	70-130	94
Toluene-d8	2037-26-5	70-130	113

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

<b>Client ID:</b>	IA-11898Belden-03_111918	<b>Date/Time Analyzed:</b>	11/29/18 06:05 PM
<b>Lab ID:</b>	1811483-04A	<b>Dilution Factor:</b>	32.4
<b>Date/Time Collected:</b>	11/19/18 03:18 PM	<b>Instrument/Filename:</b>	msd17.i / 17112912
<b>Media:</b>	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	28	51	64	Not Detected
1,4-Dioxane	123-91-1	51	180	230	Not Detected
cis-1,2-Dichloroethene	156-59-2	10	51	64	Not Detected
Tetrachloroethene	127-18-4	15	88	110	Not Detected
trans-1,2-Dichloroethene	156-60-5	19	51	64	Not Detected
Trichloroethene	79-01-6	33	70	87	Not Detected
Vinyl Chloride	75-01-4	9.9	33	41	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	92
4-Bromofluorobenzene	460-00-4	70-130	97
Toluene-d8	2037-26-5	70-130	115



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

<b>Client ID:</b>	IA-11898Belden-04_111918	<b>Date/Time Analyzed:</b>	11/29/18 06:33 PM
<b>Lab ID:</b>	1811483-05A	<b>Dilution Factor:</b>	31.7
<b>Date/Time Collected:</b>	11/19/18 02:34 PM	<b>Instrument/Filename:</b>	msd17.i / 17112913
<b>Media:</b>	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	28	50	63	Not Detected
1,4-Dioxane	123-91-1	50	170	230	Not Detected
cis-1,2-Dichloroethene	156-59-2	10	50	63	Not Detected
Tetrachloroethene	127-18-4	15	86	110	Not Detected
trans-1,2-Dichloroethene	156-60-5	19	50	63	Not Detected
Trichloroethene	79-01-6	32	68	85	Not Detected
Vinyl Chloride	75-01-4	9.7	32	40	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	91
4-Bromofluorobenzene	460-00-4	70-130	95
Toluene-d8	2037-26-5	70-130	114

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

<b>Client ID:</b>	Lab Blank	<b>Date/Time Analyzed:</b>	11/27/18 12:07 PM
<b>Lab ID:</b>	1811483-06A	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd20.i / 20112705a
<b>Media:</b>	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	87
4-Bromofluorobenzene	460-00-4	70-130	110
Toluene-d8	2037-26-5	70-130	94

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

<b>Client ID:</b>	Lab Blank	<b>Date/Time Analyzed:</b>	11/29/18 02:24 PM
<b>Lab ID:</b>	1811483-06B	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd17.i / 17112906
<b>Media:</b>	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.87	1.6	2.0	Not Detected
1,4-Dioxane	123-91-1	1.6	5.4	7.2	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.32	1.6	2.0	Not Detected
Tetrachloroethene	127-18-4	0.47	2.7	3.4	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.59	1.6	2.0	Not Detected
Trichloroethene	79-01-6	1.0	2.1	2.7	Not Detected
Vinyl Chloride	75-01-4	0.31	1.0	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	95
4-Bromofluorobenzene	460-00-4	70-130	96
Toluene-d8	2037-26-5	70-130	115

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

<b>Client ID:</b>	CCV	<b>Date/Time Analyzed:</b>	11/27/18 08:56 AM
<b>Lab ID:</b>	1811483-07A	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd20.i / 20112702
<b>Media:</b>	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	85
1,4-Dioxane	123-91-1	92
cis-1,2-Dichloroethene	156-59-2	88
Tetrachloroethene	127-18-4	107
trans-1,2-Dichloroethene	156-60-5	91
Trichloroethene	79-01-6	104
Vinyl Chloride	75-01-4	78

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	82
4-Bromofluorobenzene	460-00-4	70-130	114
Toluene-d8	2037-26-5	70-130	99

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

<b>Client ID:</b>	CCV	<b>Date/Time Analyzed:</b>	11/29/18 11:21 AM
<b>Lab ID:</b>	1811483-07B	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd17.i / 17112902
<b>Media:</b>	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	77
1,4-Dioxane	123-91-1	110
cis-1,2-Dichloroethene	156-59-2	97
Tetrachloroethene	127-18-4	97
trans-1,2-Dichloroethene	156-60-5	85
Trichloroethene	79-01-6	108
Vinyl Chloride	75-01-4	72

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	97
Toluene-d8	2037-26-5	70-130	112

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

<b>Client ID:</b>	LCS	<b>Date/Time Analyzed:</b>	11/27/18 09:59 AM
<b>Lab ID:</b>	1811483-08A	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd20.i / 20112703
<b>Media:</b>	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	81
1,4-Dioxane	123-91-1	94
cis-1,2-Dichloroethene	156-59-2	78
Tetrachloroethene	127-18-4	107
trans-1,2-Dichloroethene	156-60-5	99
Trichloroethene	79-01-6	103
Vinyl Chloride	75-01-4	81

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	79
4-Bromofluorobenzene	460-00-4	70-130	113
Toluene-d8	2037-26-5	70-130	99

\* % Recovery is calculated using unrounded analytical results.

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

<b>Client ID:</b>	LCSD	<b>Date/Time Analyzed:</b>	11/27/18 10:57 AM
<b>Lab ID:</b>	1811483-08AA	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd20.i / 20112704
<b>Media:</b>	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	79
1,4-Dioxane	123-91-1	93
cis-1,2-Dichloroethene	156-59-2	78
Tetrachloroethene	127-18-4	110
trans-1,2-Dichloroethene	156-60-5	95
Trichloroethene	79-01-6	106
Vinyl Chloride	75-01-4	78

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	77
4-Bromofluorobenzene	460-00-4	70-130	115
Toluene-d8	2037-26-5	70-130	99

\* % Recovery is calculated using unrounded analytical results.

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

<b>Client ID:</b>	LCS	<b>Date/Time Analyzed:</b>	11/29/18 12:02 PM
<b>Lab ID:</b>	1811483-08B	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd17.i / 17112903
<b>Media:</b>	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	78
1,4-Dioxane	123-91-1	118
cis-1,2-Dichloroethene	156-59-2	92
Tetrachloroethene	127-18-4	100
trans-1,2-Dichloroethene	156-60-5	94
Trichloroethene	79-01-6	115
Vinyl Chloride	75-01-4	78

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	94
4-Bromofluorobenzene	460-00-4	70-130	98
Toluene-d8	2037-26-5	70-130	113

\* % Recovery is calculated using unrounded analytical results.



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

<b>Client ID:</b>	LCSD	<b>Date/Time Analyzed:</b>	11/29/18 12:28 PM
<b>Lab ID:</b>	1811483-08BB	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd17.i / 17112904
<b>Media:</b>	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	78
1,4-Dioxane	123-91-1	117
cis-1,2-Dichloroethene	156-59-2	92
Tetrachloroethene	127-18-4	99
trans-1,2-Dichloroethene	156-60-5	94
Trichloroethene	79-01-6	113
Vinyl Chloride	75-01-4	77

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	94
4-Bromofluorobenzene	460-00-4	70-130	96
Toluene-d8	2037-26-5	70-130	113

\* % Recovery is calculated using unrounded analytical results.



November 30, 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: 1811483  
Sample date: 2018-11-19  
Report received by CADENA: 2018-11-30  
Initial Data Verification completed by CADENA: 2018-11-30

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.

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.

11/30/2018  
Mr. Jim Tomalia  
Arcadis U.S., Inc.  
28550 Cabot Dr.  
Suite 500  
Novi MI 48377

Project Name: Ford LTP  
Project #:  
Workorder #: 1811484

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 11/21/2018 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 #: 1811484**

Work Order Summary

<b>CLIENT:</b>	Mr. Jim Tomalia Arcadis U.S., Inc. 28550 Cabot Dr. Suite 500 Novi, MI 48377	<b>BILL TO:</b>	Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129
<b>PHONE:</b>	517-819-0356	<b>P.O. #</b>	MI001454.0003
<b>FAX:</b>		<b>PROJECT #</b>	Ford LTP
<b>DATE RECEIVED:</b>	11/21/2018	<b>CONTACT:</b>	Ausha Scott
<b>DATE COMPLETED:</b>	11/30/2018		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	SSMP-11898Belden-01_111918	TO-15	4.5 "Hg	15 psi
02A	SSMP-11898Belden-02_111918	TO-15	3.5 "Hg	15 psi
03A	SSMP-11898Belden-03_111918	TO-15	4.0 "Hg	15 psi
04A	SSMP-11898Belden-04_111918	TO-15	4.0 "Hg	15 psi
05A	Lab Blank	TO-15	NA	NA
06A	CCV	TO-15	NA	NA
07A	LCS	TO-15	NA	NA
07AA	LCSD	TO-15	NA	NA

CERTIFIED BY:   
 \_\_\_\_\_  
 Technical Director

DATE: 11/30/18

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# 1811484**

Four 1 Liter Summa Canister samples were received on November 21, 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

<b>Client ID:</b>	SSMP-11898Belden-01_111918	<b>Date/Time Analyzed:</b>	11/28/18 03:55 PM
<b>Lab ID:</b>	1811484-01A	<b>Dilution Factor:</b>	2.38
<b>Date/Time Collected:</b>	11/19/18 08:22 AM	<b>Instrument/Filename:</b>	msd17.i / 17112807
<b>Media:</b>	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	2.1	3.8	4.7	Not Detected
1,4-Dioxane	123-91-1	3.8	13	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.75	3.8	4.7	Not Detected
Tetrachloroethene	127-18-4	1.1	6.4	8.1	1.4 J
trans-1,2-Dichloroethene	156-60-5	1.4	3.8	4.7	Not Detected
Trichloroethene	79-01-6	2.4	5.1	6.4	Not Detected
Vinyl Chloride	75-01-4	0.73	2.4	3.0	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	94
4-Bromofluorobenzene	460-00-4	70-130	94
Toluene-d8	2037-26-5	70-130	106

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

<b>Client ID:</b>	SSMP-11898Belden-02_111918	<b>Date/Time Analyzed:</b>	11/28/18 04:23 PM
<b>Lab ID:</b>	1811484-02A	<b>Dilution Factor:</b>	2.29
<b>Date/Time Collected:</b>	11/19/18 08:51 AM	<b>Instrument/Filename:</b>	msd17.i / 17112808
<b>Media:</b>	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	2.0	3.6	4.5	Not Detected
1,4-Dioxane	123-91-1	3.6	12	16	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.73	3.6	4.5	Not Detected
Tetrachloroethene	127-18-4	1.1	6.2	7.8	18
trans-1,2-Dichloroethene	156-60-5	1.4	3.6	4.5	Not Detected
Trichloroethene	79-01-6	2.3	4.9	6.2	Not Detected
Vinyl Chloride	75-01-4	0.70	2.3	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	93
4-Bromofluorobenzene	460-00-4	70-130	95
Toluene-d8	2037-26-5	70-130	108



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

<b>Client ID:</b>	SSMP-11898Belden-03_111918	<b>Date/Time Analyzed:</b>	11/28/18 04:52 PM
<b>Lab ID:</b>	1811484-03A	<b>Dilution Factor:</b>	2.33
<b>Date/Time Collected:</b>	11/19/18 09:29 AM	<b>Instrument/Filename:</b>	msd17.i / 17112809
<b>Media:</b>	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	2.0	3.7	4.6	Not Detected
1,4-Dioxane	123-91-1	3.7	12	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.74	3.7	4.6	Not Detected
Tetrachloroethene	127-18-4	1.1	6.3	7.9	Not Detected
trans-1,2-Dichloroethene	156-60-5	1.4	3.7	4.6	Not Detected
Trichloroethene	79-01-6	2.4	5.0	6.3	Not Detected
Vinyl Chloride	75-01-4	0.71	2.4	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	94
4-Bromofluorobenzene	460-00-4	70-130	95
Toluene-d8	2037-26-5	70-130	106

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

<b>Client ID:</b>	SSMP-11898Belden-04_111918	<b>Date/Time Analyzed:</b>	11/28/18 05:20 PM
<b>Lab ID:</b>	1811484-04A	<b>Dilution Factor:</b>	2.33
<b>Date/Time Collected:</b>	11/19/18 10:01 AM	<b>Instrument/Filename:</b>	msd17.i / 17112810
<b>Media:</b>	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	2.0	3.7	4.6	Not Detected
1,4-Dioxane	123-91-1	3.7	12	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.74	3.7	4.6	Not Detected
Tetrachloroethene	127-18-4	1.1	6.3	7.9	4.3 J
trans-1,2-Dichloroethene	156-60-5	1.4	3.7	4.6	Not Detected
Trichloroethene	79-01-6	2.4	5.0	6.3	3.1 J
Vinyl Chloride	75-01-4	0.71	2.4	3.0	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	93
4-Bromofluorobenzene	460-00-4	70-130	95
Toluene-d8	2037-26-5	70-130	107

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

<b>Client ID:</b>	Lab Blank	<b>Date/Time Analyzed:</b>	11/28/18 02:14 PM
<b>Lab ID:</b>	1811484-05A	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd17.i / 17112806a
<b>Media:</b>	NA - Not Applicable		

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.87	1.6	2.0	Not Detected
1,4-Dioxane	123-91-1	1.6	5.4	7.2	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.32	1.6	2.0	Not Detected
Tetrachloroethene	127-18-4	0.47	2.7	3.4	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.59	1.6	2.0	Not Detected
Trichloroethene	79-01-6	1.0	2.1	2.7	Not Detected
Vinyl Chloride	75-01-4	0.31	1.0	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	97
4-Bromofluorobenzene	460-00-4	70-130	94
Toluene-d8	2037-26-5	70-130	107

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

<b>Client ID:</b>	CCV	<b>Date/Time Analyzed:</b>	11/28/18 12:24 PM
<b>Lab ID:</b>	1811484-06A	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd17.i / 17112803
<b>Media:</b>	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	78
1,4-Dioxane	123-91-1	107
cis-1,2-Dichloroethene	156-59-2	98
Tetrachloroethene	127-18-4	97
trans-1,2-Dichloroethene	156-60-5	87
Trichloroethene	79-01-6	105
Vinyl Chloride	75-01-4	73

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	96
4-Bromofluorobenzene	460-00-4	70-130	96
Toluene-d8	2037-26-5	70-130	109

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

<b>Client ID:</b>	LCS	<b>Date/Time Analyzed:</b>	11/28/18 01:03 PM
<b>Lab ID:</b>	1811484-07A	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd17.i / 17112804
<b>Media:</b>	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	78
1,4-Dioxane	123-91-1	112
cis-1,2-Dichloroethene	156-59-2	91
Tetrachloroethene	127-18-4	100
trans-1,2-Dichloroethene	156-60-5	97
Trichloroethene	79-01-6	110
Vinyl Chloride	75-01-4	76

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	96
4-Bromofluorobenzene	460-00-4	70-130	95
Toluene-d8	2037-26-5	70-130	106

\* % Recovery is calculated using unrounded analytical results.

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

<b>Client ID:</b>	LCSD	<b>Date/Time Analyzed:</b>	11/28/18 01:29 PM
<b>Lab ID:</b>	1811484-07AA	<b>Dilution Factor:</b>	1.00
<b>Date/Time Collected:</b>	NA - Not Applicable	<b>Instrument/Filename:</b>	msd17.i / 17112805
<b>Media:</b>	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	76
1,4-Dioxane	123-91-1	114
cis-1,2-Dichloroethene	156-59-2	91
Tetrachloroethene	127-18-4	100
trans-1,2-Dichloroethene	156-60-5	95
Trichloroethene	79-01-6	113
Vinyl Chloride	75-01-4	73

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	96
Toluene-d8	2037-26-5	70-130	109

\* % Recovery is calculated using unrounded analytical results.



November 30, 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: 1811484  
Sample date: 2018-11-19  
Report received by CADENA: 2018-11-30  
Initial Data Verification completed by CADENA: 2018-11-30

4 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.

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.