TRANSMITTAL LETTER

ARCADIS Design & Consultancy for natural and built assets

To:
Frank W Antrobius
Shawn Collins
Brandon Alger (EGLE)
Todd Walton (Ford)
Chuck Pinter (Ford)
Rob Boley (Schiff Hardin LLP)

From:
Kris Hinskey

Arcadis of Michigan, LLC
28550 Cabot Drive
Suite 500
Novi
Michigan 48377
Tel 248 994 2240
Fax 248 994 2241

Copies:

Date:
February 27, 2020

Subject:
Vapor Intrusion Assessment
Data Package

Arcadis Project No.:

We are sending you hard copies:

☒ **Attached** ☐ **Under Separate Cover Via _____ the Following Items:**

☐ Shop Drawings ☐ Plans ☐ Specifications ☐ Change Order
☐ Prints ☒ Samples ☐ Copy of Letter ☐ Reports
☐ Other:

Copies	Date	Drawing No.	Rev.	Description	Action*
1	2/28/2020			Figure	
1	2/28/2020			Analytical Results	
1	2/28/2020			Field Notes and Drawings	

Action*
☐ A Approved ☐ CR Correct and Resubmit ☐ Resubmit _____ Copies
☐ AN Approved As Noted ☐ F File ☐ Return _____ Copies
☐ AS As Requested ☐ FA For Approval ☐ Review and Comment
☐ Other:

Mailing Method
☐ U.S. Postal Service 1st Class ☐ Courier/Hand Delivery ☒ FedEx Priority Overnight ☐ FedEx 2-Day Delivery
☐ Certified/Registered Mail ☐ United Parcel Service (UPS) ☐ FedEx Standard Overnight ☐ FedEx Economy
☒ Other: email

Thank you for cooperating with the air sampling at your property on January 14 and 15, 2020. Attached is your data package.

LEGEND:

- INDOOR AIR LOCATION
- AMBIENT AIR LOCATION
- SUB-SLAB MONITORING POINT LOCATION
- BUILDING
- PROPERTY BOUNDARIES

0 15 30
SCALE IN FEET

FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

AIR SAMPLING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY: NOVI DIV: ENV DB: MG PIC: R. ELLIS PM: K. HINSKEY TM: T. STEVENS TR: P. CURRY PROJECT NUMBER: MI001373.0001.00003 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet
Z:\GISProjects_ENV\NoviBrighton_MI\FordLivonia\GIS\docs\2018-10\34401_Capitol_20181023.mxd PLOTTED: 10/26/2018 3:10:00 PM BY: mgress

eurofins | Air Toxics

1/27/2020
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #:
Workorder #: 2001427

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 1/21/2020 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

eurofins | Air Toxics

WORK ORDER #: 2001427

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. #**	30016344.0002B
FAX:		**PROJECT #**	Ford LTP
DATE RECEIVED:	01/21/2020	**CONTACT:**	Ausha Scott
DATE COMPLETED:	01/27/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SSMP-34401CAPITOLST-01_011520	TO-15	5.1 "Hg	15.2 psi
02A	Lab Blank	TO-15	NA	NA
03A	CCV	TO-15	NA	NA
04A	LCS	TO-15	NA	NA
04AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes

Technical Director

DATE: 01/27/20

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2019, Expiration date: 10/17/2020.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
Arcadis U.S., Inc.
Workorder# 2001427

One 1 Liter Summa Canister (100% Certified) sample was received on January 21, 2020. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

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

Definition of Data Qualifying Flags

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

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

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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

Client ID:	SSMP-34401CAPITOLST-01_011520		
Lab ID:	2001427-01A	**Date/Time Analyzed:**	1/24/20 11:54 PM
Date/Time Collected:	1/15/20 12:32 PM	**Dilution Factor:**	2.45
Media:	1 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msd17.i / 17012425

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	2.1	3.9	4.8	Not Detected
1,4-Dioxane	123-91-1	9.4	13	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	1.4	3.9	4.8	Not Detected
Tetrachloroethene	127-18-4	3.3	6.6	8.3	45
trans-1,2-Dichloroethene	156-60-5	1.4	3.9	4.8	Not Detected
Trichloroethene	79-01-6	2.4	5.3	6.6	Not Detected
Vinyl Chloride	75-01-4	1.2	2.5	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	116
4-Bromofluorobenzene	460-00-4	70-130	99
Toluene-d8	2037-26-5	70-130	96

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

Client ID:	Lab Blank		
Lab ID:	2001427-02A	**Date/Time Analyzed:**	1/24/20 11:53 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd17.i / 17012405c

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	3.8	5.4	7.2	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.56	1.6	2.0	Not Detected
Tetrachloroethene	127-18-4	1.4	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	0.97	2.1	2.7	Not Detected
Vinyl Chloride	75-01-4	0.51	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	112
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:	CCV		
Lab ID:	2001427-03A	**Date/Time Analyzed:**	1/24/20 10:14 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd17.i / 17012402

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	104
1,4-Dioxane	123-91-1	89
cis-1,2-Dichloroethene	156-59-2	102
Tetrachloroethene	127-18-4	97
trans-1,2-Dichloroethene	156-60-5	97
Trichloroethene	79-01-6	97
Vinyl Chloride	75-01-4	88

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	112
4-Bromofluorobenzene	460-00-4	70-130	104
Toluene-d8	2037-26-5	70-130	101

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

Client ID:	LCS		
Lab ID:	2001427-04A	**Date/Time Analyzed:**	1/24/20 10:41 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd17.i / 17012403

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	102
1,4-Dioxane	123-91-1	95
cis-1,2-Dichloroethene	156-59-2	96
Tetrachloroethene	127-18-4	102
trans-1,2-Dichloroethene	156-60-5	109
Trichloroethene	79-01-6	101
Vinyl Chloride	75-01-4	92

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	115
4-Bromofluorobenzene	460-00-4	70-130	106
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		
Lab ID:	2001427-04AA	**Date/Time Analyzed:**	1/24/20 11:07 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd17.i / 17012404

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	104
1,4-Dioxane	123-91-1	94
cis-1,2-Dichloroethene	156-59-2	99
Tetrachloroethene	127-18-4	99
trans-1,2-Dichloroethene	156-60-5	107
Trichloroethene	79-01-6	100
Vinyl Chloride	75-01-4	87

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	103
Toluene-d8	2037-26-5	70-130	99

* % Recovery is calculated using unrounded analytical results.

January 28, 2020

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

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30016344.0002B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics -Folsom
Laboratory submittal: 2001427
Sample date: 2020-01-15
Report received by CADENA: 2020-01-27
Initial Data Verification completed: 2020-01-28

1 Air sample was analyzed for TO-15 parameters.

No data qualifications or sample integrity issues were observed.

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

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

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

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) 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 contaminates) 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.

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) TO-15 Analysis

SDG #2001427

CADENA Verification Report: 2020-01-28

Analyses Performed By:
Eurofins Air Toxics
Folsom, California

Report #35941R
Review Level: Tier III
Project: 30042006.0302.03

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 2001427 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						TO-15 (Full Scan)	TO-15 (SIM)	MISC
2001427	SSMP-34401CAPITOLST-01_011520	2001427-01A	Air	1/15/2020		X		

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	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Method TO-15 (Full Scan). Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation	Return Canister Pressure
USEPA TO-15	Air	30 days from collection to analysis (Canister)	Ambient Temperature	< -2" Hg

All samples were analyzed within the specified holding time and canister return pressure / vacuum criteria.

2. Mass Spectrometer Tuning

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

System performance and column resolution were acceptable.

3. Calibration

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

3.1 Initial Calibration

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

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (30%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

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

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (30%) and RRF value greater than control limit (0.05).

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

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than 140% or less than 60% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Compound Identification

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

All identified compounds met the specified criteria.

6. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 35% for air matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are not greater than five times the RL, a control limit of three times the RL is applied to the difference between the duplicate sample results.

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

7. System Performance and Overall Assessment

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

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: TO-15 (Full Scan)	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Canister return pressure (<-2”Hg)		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Field Duplicate Sample RPD					X
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE:

DATE: February 25, 2020

PEER REVIEW: Joseph C. Houser

DATE: February 26, 2020

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

Analysis Request /Canister Chain of Custody

For Laboratory Use Only
PID: ______ Workorder #: 2001427

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

Click links below to view:
Canister Sampling Guide
Helium Shroud Video

Client:	Ford	PID:	NA
Project Name:	Ford LTP		
Project Manager:	Kris Hinskey	P.O.#	30016344.0002B
Sampler:	Shantel Johnson		
Site Name:	34401 CAPITOL		

Special Instructions/Notes: Report ONLY: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting

Turnaround Time (Rush surcharges may apply)
5 Day Turnaround Time

Lab ID	Sample Identification	Can #	Flow Controller #	Start Sampling Information		Stop Sampling Information		Canister Vacuum/Pressure		Lab Use Only		Requested Analyses			
				Date	Time	Date	Time	Initial (in Hg)	Final (in Hg)	Receipt	Final (psig) Gas: N_2 / He	TO-15 (See Special Instructions/Notes)	Do Not Analyze		
01A	SSMP-34401CAPITOLST-01_011520	1L1668	23443	1/15/2020	12:21	1/15/2020	12:32	-29.9	-6			X			
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Relinquished by: (Signature/Affiliation) /Arcadis	Date 1-17-20	Time 1600	Received by: (Signature/Affiliation)	Date 01/21/20	Time 0915
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Lab Use Only

Shipper Name: FDX
Custody Seals Intact? [✓ Yes] No None

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

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

Client ID:	SSMP-34401CAPITOLST-01_011520		
Lab ID:	2001427-01A	**Date/Time Analyzed:**	1/24/20 11:54 PM
Date/Time Collected:	1/15/20 12:32 PM	**Dilution Factor:**	2.45
Media:	1 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msd17.i / 17012425

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	2.1	3.9	4.8	Not Detected
1,4-Dioxane	123-91-1	9.4	13	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	1.4	3.9	4.8	Not Detected
Tetrachloroethene	127-18-4	3.3	6.6	8.3	45
trans-1,2-Dichloroethene	156-60-5	1.4	3.9	4.8	Not Detected
Trichloroethene	79-01-6	2.4	5.3	6.6	Not Detected
Vinyl Chloride	75-01-4	1.2	2.5	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	116
4-Bromofluorobenzene	460-00-4	70-130	99
Toluene-d8	2037-26-5	70-130	96

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1/28/2020
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #:
Workorder #: 2001434

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 1/21/2020 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

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WORK ORDER #: 2001434

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. #**	30016344.0002B
FAX:		**PROJECT #**	Ford LTP
DATE RECEIVED:	01/21/2020	**CONTACT:**	Ausha Scott
DATE COMPLETED:	01/28/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AA-34401CAPITOLST-01_011520	Modified TO-15	8 "Hg	5.1 psi
02A	DUP-34401CAPITOLST-01_011520	Modified TO-15	1.4 "Hg	5.2 psi
03A	IAG-34401CAPITOLST-01_011520	Modified TO-15	5.1 "Hg	5.2 psi
04A	IAF-34401CAPITOLST-01_011520	Modified TO-15	6.9 "Hg	4.9 psi
05A	Lab Blank	Modified TO-15	NA	NA
06A	CCV	Modified TO-15	NA	NA
07A	LCS	Modified TO-15	NA	NA
07AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Hayes

Technical Director

DATE: 01/28/20

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2019, Expiration date: 10/17/2020.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
Modified TO-15
Arcadis U.S., Inc.
Workorder# 2001434

Four 6 Liter Summa Canister (100% Cert Ambient) samples were received on January 21, 2020. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

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

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

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

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

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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

Client ID:	AA-34401CAPITOLST-01_011520		
Lab ID:	2001434-01A	**Date/Time Analyzed:**	1/22/20 07:03 PM
Date/Time Collected:	1/15/20 12:35 PM	**Dilution Factor:**	1.83
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd22.i / 22012216

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.22	0.29	0.72	Not Detected
1,4-Dioxane	123-91-1	0.12	0.26	0.66	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.074	0.29	0.72	Not Detected
Tetrachloroethene	127-18-4	0.28	0.50	1.2	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.12	0.29	0.72	Not Detected
Trichloroethene	79-01-6	0.10	0.39	0.98	Not Detected
Vinyl Chloride	75-01-4	0.065	0.19	0.47	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	112
4-Bromofluorobenzene	460-00-4	70-130	104
Toluene-d8	2037-26-5	70-130	101

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

Client ID:	DUP-34401CAPITOLST-01_011520		
Lab ID:	2001434-02A	**Date/Time Analyzed:**	1/22/20 07:49 PM
Date/Time Collected:	1/15/20 12:00 AM	**Dilution Factor:**	1.42
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd22.i / 22012217

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.17	0.22	0.56	Not Detected
1,4-Dioxane	123-91-1	0.096	0.20	0.51	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.058	0.22	0.56	Not Detected
Tetrachloroethene	127-18-4	0.22	0.38	0.96	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.093	0.22	0.56	Not Detected
Trichloroethene	79-01-6	0.079	0.30	0.76	Not Detected
Vinyl Chloride	75-01-4	0.050	0.14	0.36	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	113
4-Bromofluorobenzene	460-00-4	70-130	113
Toluene-d8	2037-26-5	70-130	107

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

Client ID:	IAG-34401CAPITOLST-01_011520		
Lab ID:	2001434-03A	**Date/Time Analyzed:**	1/22/20 09:03 PM
Date/Time Collected:	1/15/20 12:07 PM	**Dilution Factor:**	1.63
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd22.i / 22012218

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.20	0.26	0.65	Not Detected
1,4-Dioxane	123-91-1	0.11	0.23	0.59	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.066	0.26	0.65	Not Detected
Tetrachloroethene	127-18-4	0.25	0.44	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.11	0.26	0.65	Not Detected
Trichloroethene	79-01-6	0.090	0.35	0.88	Not Detected
Vinyl Chloride	75-01-4	0.058	0.17	0.42	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	110
4-Bromofluorobenzene	460-00-4	70-130	109
Toluene-d8	2037-26-5	70-130	104

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

Client ID:	IAF-34401CAPITOLST-01_011520		
Lab ID:	2001434-04A	**Date/Time Analyzed:**	1/22/20 09:45 PM
Date/Time Collected:	1/15/20 12:03 PM	**Dilution Factor:**	1.73
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd22.i / 22012219

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.21	0.27	0.68	Not Detected
1,4-Dioxane	123-91-1	0.12	0.25	0.62	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.070	0.27	0.68	Not Detected
Tetrachloroethene	127-18-4	0.27	0.47	1.2	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.11	0.27	0.68	Not Detected
Trichloroethene	79-01-6	0.096	0.37	0.93	Not Detected
Vinyl Chloride	75-01-4	0.062	0.18	0.44	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	108
Toluene-d8	2037-26-5	70-130	104

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

Client ID:	Lab Blank		
Lab ID:	2001434-05A	**Date/Time Analyzed:**	1/22/20 12:24 PM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd22.i / 22012207a

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.12	0.16	0.40	Not Detected
1,4-Dioxane	123-91-1	0.068	0.14	0.36	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.041	0.16	0.40	Not Detected
Tetrachloroethene	127-18-4	0.15	0.27	0.68	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.066	0.16	0.40	Not Detected
Trichloroethene	79-01-6	0.055	0.21	0.54	Not Detected
Vinyl Chloride	75-01-4	0.036	0.10	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	118
4-Bromofluorobenzene	460-00-4	70-130	96
Toluene-d8	2037-26-5	70-130	104

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

Client ID:	CCV		
Lab ID:	2001434-06A	**Date/Time Analyzed:**	1/22/20 09:21 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd22.i / 22012203

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	93
1,4-Dioxane	123-91-1	118
cis-1,2-Dichloroethene	156-59-2	95
Tetrachloroethene	127-18-4	124
trans-1,2-Dichloroethene	156-60-5	104
Trichloroethene	79-01-6	128
Vinyl Chloride	75-01-4	105

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	105
Toluene-d8	2037-26-5	70-130	120

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

Client ID:	LCS		
Lab ID:	2001434-07A	**Date/Time Analyzed:**	1/22/20 10:24 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd22.i / 22012204

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	92
1,4-Dioxane	123-91-1	117
cis-1,2-Dichloroethene	156-59-2	85
Tetrachloroethene	127-18-4	115
trans-1,2-Dichloroethene	156-60-5	113
Trichloroethene	79-01-6	124
Vinyl Chloride	75-01-4	110

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	108
Toluene-d8	2037-26-5	70-130	118

* % Recovery is calculated using unrounded analytical results.

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

Client ID:	LCSD		
Lab ID:	2001434-07AA	**Date/Time Analyzed:**	1/22/20 11:07 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd22.i / 22012205

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	92
1,4-Dioxane	123-91-1	116
cis-1,2-Dichloroethene	156-59-2	86
Tetrachloroethene	127-18-4	113
trans-1,2-Dichloroethene	156-60-5	111
Trichloroethene	79-01-6	122
Vinyl Chloride	75-01-4	108

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	104
4-Bromofluorobenzene	460-00-4	70-130	105
Toluene-d8	2037-26-5	70-130	116

* % Recovery is calculated using unrounded analytical results.

January 28, 2020

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

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30016344.0002B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics -Folsom
Laboratory submittal: 2001434
Sample date: 2020-01-15
Report received by CADENA: 2020-01-28
Initial Data Verification completed: 2020-01-28

4 Air samples were analyzed for TO-15 parameters.

No data qualifications or sample integrity issues were observed.

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

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

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

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) 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 contaminates) 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.

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) TO-15 Analysis

SDG #2001434

CADENA Verification Report: 2020-01-28

Analyses Performed By:
Eurofins Air Toxics
Folsom, California

Report #35942R
Review Level: Tier III
Project: 30042006.0302.03

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 2001434 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						TO-15 (Full Scan)	TO-15 (SIM)	MISC
2001434	AA-34401CAPITOLST-01_011520	2001434-01A	Air	1/15/2020		X		
	DUP-34401CAPITOLST-01_011520	2001434-02A	Air	1/15/2020	IAG-34401CAPITOLST-01_011520	X		
	IAG-34401CAPITOLST-01_011520	2001434-03A	Air	1/15/2020		X		
	IAF-34401CAPITOLST-01_011520	2001434-04A	Air	1/15/2020		X		

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	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Method TO-15 (Full Scan). Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation	Return Canister Pressure
USEPA TO-15	Air	30 days from collection to analysis (Canister)	Ambient Temperature	< -2" Hg

All samples were analyzed within the specified holding time and canister return pressure / vacuum criteria.

2. Mass Spectrometer Tuning

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

System performance and column resolution were acceptable.

3. Calibration

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

3.1 Initial Calibration

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

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (30%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

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

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (30%) and RRF value greater than control limit (0.05).

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

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than 140% or less than 60% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Compound Identification

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

All identified compounds met the specified criteria.

6. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 35% for air matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are not greater than five times the RL, a control limit of three times the RL is applied to the difference between the duplicate sample results.

Results (in µg/m^3) for the field duplicate samples are summarized in the following table.

Sample ID / Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
IAG-34401CAPITOLST-01_011520/ DUP-34401CAPITOLST-01_011520	All compounds	U	U	AC

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

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 VALIDATION CHECKLIST FOR VOCs

VOCs: TO-15 (Full Scan)	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Canister return pressure (<-2”Hg)		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Field Duplicate Sample RPD					X
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE:

DATE: February 25, 2020

PEER REVIEW: Joseph C. Houser

DATE: February 26, 2020

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

PID: ____________ Workorder #: 2001434

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

Click links below to view:
Canister Sampling Guide
Helium Shroud Video

Client:	Ford	PID:	NA
Project Name:	Ford LTP		
Project Manager:	Kris Hinskey	P.O.#	30016344.0002B
Sampler:	Madison Olender		
Site Name:	34401 CAPITOL		

Special Instructions/Notes: Report ONLY: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting

Turnaround Time (Rush surcharges may apply)

5 Day Turnaround Time

Lab ID	Sample Identification	Can #	Flow Controller #	Start Sampling Information		Stop Sampling Information		Canister Vacuum/Pressure		Lab Use Only		Requested Analyses			
				Date	Time	Date	Time	Initial (in Hg)	Final (in Hg)	Receipt	Final (psig) Gas: N_2 / He	TO-15 (See Special Instructions/Notes)	Do Not Analyze		
01A	AA-34401CAPITOLST-01_011520	6L1046	20762	1/14/2020	13:08	1/15/2020	12:35	-30	-9			X			
02A	DUP-34401CAPITOL-01_011520	6L0942	22190	1/14/2020	--	1/15/2020	--	-29.7	-3			X			
03A	IAG-34401CAPITOLST-01_011520	000002231	22488	1/14/2020	13:13	1/15/2020	12:07	-29.6	-6.5			X			
04A	IAF-34401CAPITOLST-01_011520	6L2241	22862	1/14/2020	13:18	1/15/2020	12:03	-29.7	-7			X			
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Relinquished by: (Signature/Affiliation) /Arcadis	Date 1-17-20	Time 1600	Received by: (Signature/Affiliation) EATL	Date 01/21/20	Time 0915
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Lab Use Only

Shipper Name: FedEx | Custody Seals Intact? [✓ Yes] No None

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

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

Client ID:	AA-34401CAPITOLST-01_011520		
Lab ID:	2001434-01A	**Date/Time Analyzed:**	1/22/20 07:03 PM
Date/Time Collected:	1/15/20 12:35 PM	**Dilution Factor:**	1.83
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd22.i / 22012216

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.22	0.29	0.72	Not Detected
1,4-Dioxane	123-91-1	0.12	0.26	0.66	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.074	0.29	0.72	Not Detected
Tetrachloroethene	127-18-4	0.28	0.50	1.2	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.12	0.29	0.72	Not Detected
Trichloroethene	79-01-6	0.10	0.39	0.98	Not Detected
Vinyl Chloride	75-01-4	0.065	0.19	0.47	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	112
4-Bromofluorobenzene	460-00-4	70-130	104
Toluene-d8	2037-26-5	70-130	101

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

Client ID:	DUP-34401CAPITOLST-01_011520		
Lab ID:	2001434-02A	**Date/Time Analyzed:**	1/22/20 07:49 PM
Date/Time Collected:	1/15/20 12:00 AM	**Dilution Factor:**	1.42
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd22.i / 22012217

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.17	0.22	0.56	Not Detected
1,4-Dioxane	123-91-1	0.096	0.20	0.51	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.058	0.22	0.56	Not Detected
Tetrachloroethene	127-18-4	0.22	0.38	0.96	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.093	0.22	0.56	Not Detected
Trichloroethene	79-01-6	0.079	0.30	0.76	Not Detected
Vinyl Chloride	75-01-4	0.050	0.14	0.36	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	113
4-Bromofluorobenzene	460-00-4	70-130	113
Toluene-d8	2037-26-5	70-130	107

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

Client ID:	IAG-34401CAPITOLST-01_011520		
Lab ID:	2001434-03A	**Date/Time Analyzed:**	1/22/20 09:03 PM
Date/Time Collected:	1/15/20 12:07 PM	**Dilution Factor:**	1.63
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd22.i / 22012218

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.20	0.26	0.65	Not Detected
1,4-Dioxane	123-91-1	0.11	0.23	0.59	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.066	0.26	0.65	Not Detected
Tetrachloroethene	127-18-4	0.25	0.44	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.11	0.26	0.65	Not Detected
Trichloroethene	79-01-6	0.090	0.35	0.88	Not Detected
Vinyl Chloride	75-01-4	0.058	0.17	0.42	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	110
4-Bromofluorobenzene	460-00-4	70-130	109
Toluene-d8	2037-26-5	70-130	104

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

Client ID:	IAF-34401CAPITOLST-01_011520		
Lab ID:	2001434-04A	**Date/Time Analyzed:**	1/22/20 09:45 PM
Date/Time Collected:	1/15/20 12:03 PM	**Dilution Factor:**	1.73
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd22.i / 22012219

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.21	0.27	0.68	Not Detected
1,4-Dioxane	123-91-1	0.12	0.25	0.62	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.070	0.27	0.68	Not Detected
Tetrachloroethene	127-18-4	0.27	0.47	1.2	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.11	0.27	0.68	Not Detected
Trichloroethene	79-01-6	0.096	0.37	0.93	Not Detected
Vinyl Chloride	75-01-4	0.062	0.18	0.44	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	108
Toluene-d8	2037-26-5	70-130	104

Daily Log - Ford Off Site VI Investigation - VISIT 1

Project No.: MI001454.0003.00002 / 30016344

Site Location: 34401 CAPITOL

Personnel Onsite: Shantel Johnson, Madison Olender

Date	Time	Description of Activities
1/13/2020		Purpose: R4 visit 1; Chemical Inventory, Building Survey
		Weather: 33.98 degrees F and Fog/Mist
		Equipment: PID 6153
	12:00	Arcadis on site
	12:05	Conduct EGLE survey; request windows and doors shut during sampling
	12:20	Conduct chemical inventory
	12:25	Arcadis off site
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Visit 1 Checklist

Keeping windows & doors shut during IA/AA sampling was discussed? yes

Have background sources of VOCs been removed/isolated? yes

Is a sump pit present in the building? no

Location of removed/isolated background VOCs: Tote in shed

Field Staff Signature:

Daily Log - Ford Off Site VI Investigation - VISIT 2

Project No.: MI001454.0003.00002 / 30016344

Site Location: 34401 CAPITOL

Personnel Onsite: Shantel Johnson, Madison Olender

Date	Time	Description of Activities
1/14/2020		Purpose: R4 visit 2; canister deployment
		Weather: 39.92 degrees F and Haze
		Equipment: PID 6153
	13:00	Arcadis on site
	13:08	Conduct canister deployment
	13:30	Arcadis off site
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Visit 2 Checklist

Windows and doors are shut (for IA samples only)? yes

Have background sources of VOCs been removed/isolated? yes

Number of SSMP samples collected: 0

Number of indoor/ambient air samples collected: 4

Occupancy hours (for commercial properties only): --

Field Staff Signature:

Daily Log - Ford Off Site VI Investigation - VISIT 3

Project No.: MI001454.0003.00002 / 30016344

Site Location: 34401 CAPITOL

Personnel Onsite: Shantel Johnson, Madison Olender

Date	Time	Description of Activities
1/15/2020		Purpose: R4 visit 3; Canister collection, SSMP sampling
		Weather: 37.94 degrees F and Mostly Clear
		Equipment: GEM
	12:00	Arcadis on site
	12:03	Conduct canister collection
	12:21	Conduct SSMP sampling
	12:45	Arcadis off site
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Visit 3 Checklist

Windows and doors are shut (for IA samples only)? yes

Have background sources of VOCs been removed/isolated? yes

Number of SSMP samples collected: 1

Number of indoor/ambient air samples collected: 4

Occupancy hours (for commercial properties only): --

Field Staff Signature:

ARCADIS Design & Consultancy for natural and built assets

PROJECT TITLE: Offsite VI
PROJECT NO. MI001454.0003/30016344
CLIENT: Ford
ADDRESS: 3440 CAPITOL
SAMPLING DATE: 1/14/20 – 1/15/20

Initial each item when complete

QC Initial	Date	Final Review	Date	Criteria	Notes (add note or NA to all)
				Data Quality	
CW	1/23/20	ST	1/24/20	Are canister starting (28" Hg or better) and ending vacuum -2 to -10" Hg acceptable?	OUP purposely set to "0" for DNA purposes.
				Shut in test completed on canisters and sample train?	
				Were canisters deployed for full duration (8-hr, 12-hr, 24-hr)?	Until recomended pressure met & time. to leave Property.
				Was helium test compliant with SOP (helium concentration > 40%, < 2% leakage)?	
				Sample Identification	
ST	1/17/20			Are the sample tags affixed to the canisters?	
				Is the address correct in the sample name?	
				Are all duplicates uniquely identified?	
				Do the canister numbers and flow controller numbers match the tags on the equipment?	
				Is the sample tag initialed?	
				Is the address correct on the upper portion of the COC?	
				Is the COC signed, dated, and time stamped?	
				Shipment	
ST	1/17/20			Is the COC in the box being shipped?	
				Is a copy of the COC with the field notes?	
				Have custody seals been affixed to the top and bottom of the box?	
				Field Notes	
CW	1/23/20	ST	1/24/20	Are notes from visits logical?	Rearranged to match sequence ~~to~~ CW events and times.
				Did field staff notify property owner to keep windows and doors shut during sampling?	Added note after asking staff
				Do the notes include onsite and offsite times?	Added offsite.
				Are additional staff onsite listed in addition to the person writing the notes?	
				Is the correct round of sampling listed on the notes?	Added R4 & descriptions.
				Is there the correct amount of meterlogical data on the sample log?	
				Are field notes signed?	
				EGLE Survey	
CW	1/23/20	ST	1/24/20	Is the updated name and date provided for interviewer and interviewee?	
				Are changes made in red pen in the survey? If no changes, is that noted?	Added not after asking staff.
				Have updated PID readings been added to the chemical inventory?	
				Has the updated AA location been noted on the map?	
				If there was an IACS sample, is it noted that IACS sampling was only collected during round 1?	Added note
				If there was a soil boring, is it noted that these were only conducted during round 1? If no soil boring, is the well used for depth to water noted (unless no sub slab necessary)?	Added note.
				If an IA canister was located in the kitchen, has the new location and note with explanation been added to the map?	

Remediation and Redevelopment Division
Standard Operating Procedure
Date: February 1, 2013

Indoor Air Sampling Procedure Via USEPA Method TO-15

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM

Date: 10/3/18 Survey Performed by: Donald Richmond
Round 2: 2-20-19 Hayden Ladd

1. OCCUPANT: R3: 4-16-19 Hayden Ladd
R4: 1/13/20 S. JOHNSON - no changes since R3.

Rent: ____ Own: ✓

Resident Name: Frank W. Batrous

Address: 3440 Capital St

Telephone: Home: 734 716 3175 Work: ____

How long have you lived at this location? 2006

List current occupants/occupation below (attach additional pages if necessary):

Age (If under 18)	Sex (M/F)	Occupation
		2 - Frank and wife (Dentist)

2. OWNER OR LANDLORD: (If same as occupant, check here ✓ and go to Item No. 3).

Last Name: ____ First Name: ____

Address: ____

City and State: ____

County: ____

Home Phone: ____ Office Phone: ____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

3. **SENSITIVE POPULATION:**

Daycare/Nursing Home/Hospital/School/Other (specify): NA

4. **BUILDING CHARACTERISTICS:**

Residential/Multi-family Residential/Office/Strip Mall/Commercial/Industrial/School

Describe Building: Residential Year Constructed: ? 1950s-1960s

Number of floors at or above grade: 1

Number of floors below grade: 0 (full basement/crawl space/slab on grade)

Depth of structure below grade: 0 ft. Basement size: NA ft²

If the property is residential, what type? (Circle all appropriate responses.)

Ranch	2-Family	3-Family	Raised Ranch
Split Level	Colonial	Cape Cod	Contemporary
Mobile Home	Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:	

If multiple units, how many? _____

If the property is commercial:

Business type(s) NA

Does it include residences (i.e.. multi-use)? Yes No If yes, how many? ____

5. **OCCUPANCY:**

Is basement/lowest level occupied? (Circle one)

Full-time Occasionally Seldom Almost Never

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Level	General Use (e.g., family room, bedroom, laundry, workshop, storage)
Basement	N/A
1st Floor	Family room
2nd Floor	Bedrooms
3rd Floor	
4th Floor	

(Use additional page(s) as necessary)

6. **CONSTRUCTION CHARACTERISTICS: (Circle all that apply.)**

a. Above Grade Construction: (Describe type: wood frame, concrete, stone, brick).

~~Concrete block~~ M

b. Basement Type: Full Crawlspace Slab Other: _____ No basement

c. Basement Floor: Concrete Dirt Stone Other: _____ (Crawl Space)

d. Finished Basement Floor: Uncovered Covered

If covered, what with? N/A

e. Foundation Walls: Poured Block Stone Other: _____

f. Foundation Walls: Unsealed Sealed Sealed with: _____

g. The Basement is: Wet Damp Dry N/A

h. The Basement is: Finished Unfinished Partially Finished N/A

i. Sump Present (Y / N) If yes, how many? _____

Where Discharged? N/A

Water in Sump? Yes No Not Applicable

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Identify all potential soil vapor entry points and estimated size (e.g., cracks, utility parts, drains).

Expansion Joints in garage, Sump in crawl space

Are the basement walls or floor sealed with waterproof paint or epoxy coatings? Yes No N/A

Type of ground cover outside of building: (Grass) Concrete Asphalt Other _____

Is an existing subsurface depressurization (radon) system in place? Yes (No)

If yes, is it active, or passive?

Is a sub-slab vapor/moisture barrier in place? Yes (No)

Type of barrier: N/A

7. HEATING, VENTING, and AIR CONDITIONING

Type of heating system(s) used in this building: (Circle all that apply: Note the primary)

Hot Air Circulation	Heat Pump	Hot Water Baseboard
Space Heaters	Steam Radiation	Radiant Floor
Electric Baseboard	Wood Stove	Outdoor Wood Boiler

Other: Forced air with electric space heater

The primary type of fuel used is:

(Natural Gas)	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: Natural Gas

Location of Boiler/Furnace: Basement Outdoors (Main Floor) Other _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Air Conditioning: (Central Air) Window Units Open Windows None

Are air distribution ducts present? (Yes) No

Is there a whole house fan? Yes (No)

Describe the air intake system (outside air supply, cold air return, ductwork, etc.) and its condition where visible. Indicate the locations on the floor plan diagram.

Ductwork is in good condition.

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a) Is there an attached garage? Yes (No)

If yes, does it have a separate heating unit? Yes (No)

b) Are any petroleum-powered machines or vehicles stored in an attached garage (e.g., lawn mower, ATV, car) (Yes) No

Vehicle - car

c) Has the building ever had a fire? Yes (No)

d) Is there a fuel burning or unvented gas space heater? Yes (No)

e) Is there a workshop or hobby/craft area? (Yes) No

If yes, where and what type? Car re-store

f) Is there smoking in the building? (Yes) (No)

If yes, how frequently? Every day - wife quit smoking

R3: Infrequent smoking

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

g) Have cleaning products been used recently? **Yes** No

If yes, when and what type? Daily w/ wash - general purpose cleaning

h) Have cosmetic products been used recently? Yes **No**

If yes, when and what type? _____

i) Has there been painting or staining in the last six months? **Yes** No

If yes, when and where? In Garage only (Spray paint)

j) Is there new carpet, drapes, or other textiles? Yes **No**

If yes, when and where? _____

k) Have air fresheners been used recently? **Yes** No

If yes, when and what type? plug-in in bathroom (Glade) - taken out of bathroom

l) Is there a kitchen exhaust fan? Yes **No**

If yes, where is it vented? _____

m) Is there a clothes dryer? **Yes** No

If yes, is it vented outside? **Yes** No

n) Has there been a pesticide application? Yes **No**

If yes, when and what type? _____

o) Are there odors in the building? **Yes** No

If yes, please describe. Cigarette smoke, paint in garage

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

p) Do any of the building occupants use solvents at work (e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetology)?

(Yes) No

If yes, what types of solvents are used? Paint thinner

If yes, are their clothes washed at work? Yes (No) at home

q) Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response.)

(No) Unknown

Yes, use dry-cleaning regularly (weekly)

Yes, use dry-cleaning infrequently (monthly or less)

Yes, work at a dry-cleaning service

r) Is there a radon mitigation system for the building/structure? Yes (No)

If yes, what is date of installation? NA Active Passive

s) Additional mitigation system information (fan size, location, operating status, liner installed, etc.):

NA

[illegible] 927[illegible] [illegible] # [illegible]

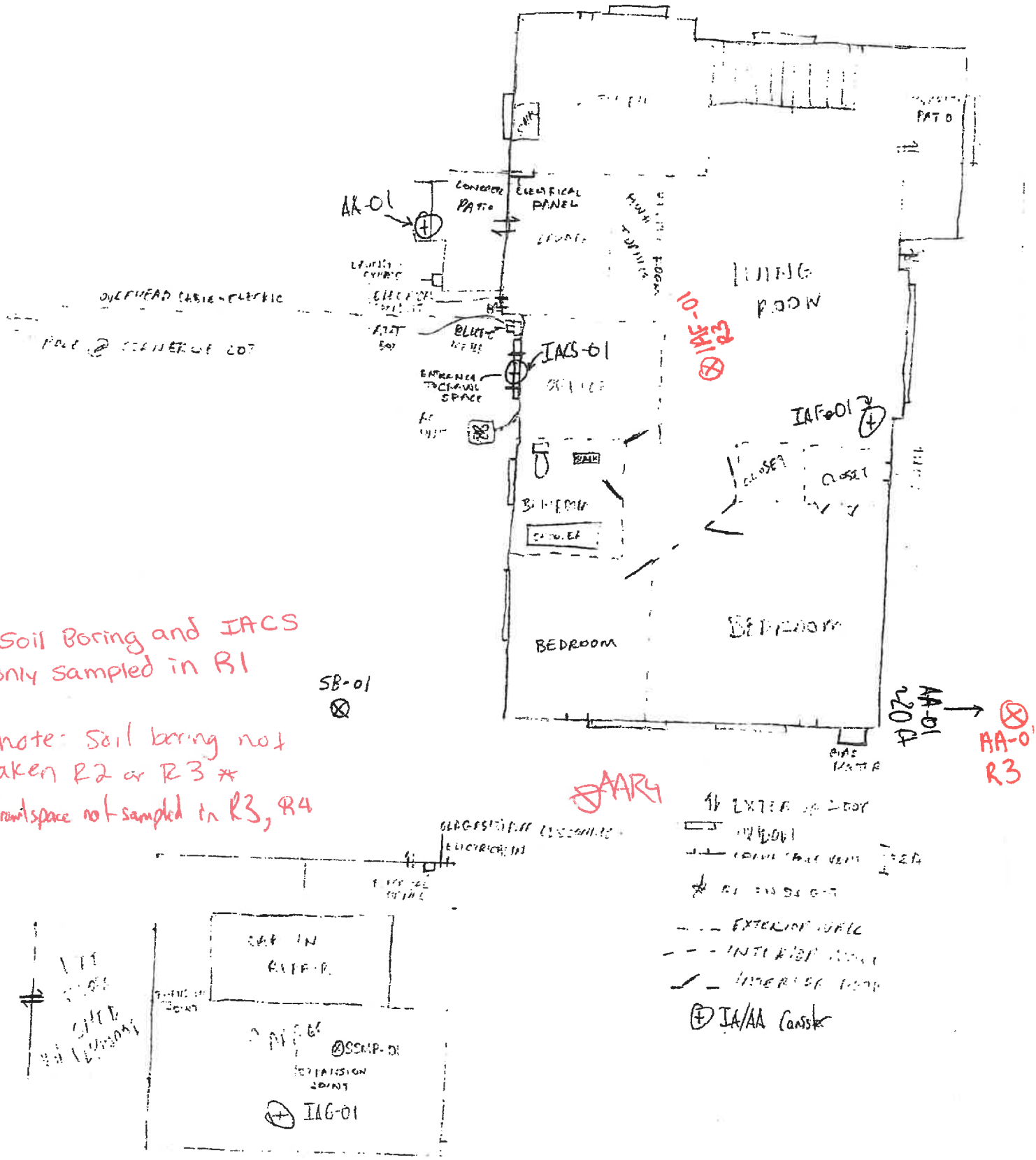
PRODUCT INVENTORY FORM:

Make and Model of field instrument used:_____

List specific products found in the residence or area that have the potential to affect indoor air quality (e.g., gasoline or kerosene storage cans, glues, paints, cleaning solvents/products, polishes/waxes, new furniture/carpet, nail polish/hairspray/cologne).

Potential Source	Location	Size and Condition	Chemical Ingredients	Field Instrument Reading (units)	Photo Y/N
Gasoline Storage Cans and Equipment					
Kerosene Storage Cans				[redacted]	[redacted]
Paints/Thinners/Strippers					
Cleaning Solvents	Garage	1 gal	VOCS	2666 PPB	Y
Hobby Supplies – Glue, Paint, Etc.	Garage	½ gal	VOCS	986 PPB	Y
Oven Cleaner	Garage	1 gal	VOCS	2664 PPB	Y
Carpet/Upholstery Cleaners					
Household Cleaners (non-solvent)	[illegible]				
Moth Balls	[illegible]	1 9:1	VOCS	160 PPB	Y
Polishes/Waxes	Garage	1 box	VOCS	4171	Y
Insecticides					
Furniture/Floor Polish	Garage	½ gal	VOCS	519 PPB	Y
Hairspray					
Cologne/Perfume					
Air Fresheners					
Interior Fuel Tank					
Wood Stove/Fireplace	[redacted]				
New Furniture/Upholstery					
New Carpeting/Flooring					
Others (fill in below)					
R4 ★ DIMENSION PRO	MODERATE REDUCER				
AIRCRAFT	PAINT REMOVER				
FINISH 1	REFINISH PRODUCT				

R4 GARAGE PID: 850 PPB



* Soil Boring and IACS only sampled in R1

* note: Soil boring not taken R2 or R3 *

· Crawlspace not sampled in R3, R4

34401 CAPITOL

Room 2 [illegible]

Product Inventory Form

I.e. gasoline cans/equipment, kerosene, paints/thinners/strippers, cleaning solvents, hobby supplies (glues), oven cleaner, carpet/upholstery cleaners, household cleaners, moth balls, polishes/waxes, insecticides, furniture/floor polish, hairspray, cologne/perfume, air fresheners, interior fuel tank, wood stove/fireplace, new furniture/upholstery, new carpet/flooring

Location	Product Description	Chemical Ingredients	Quantity	PID Reading (ppb)	Photo	Removed (Y/N)
Kitchen	General Household Cleaner	NA	Multiple	100	Yes	N
Laundry Room	OER Interior Paint	Dimethyl Ether, MEK, Xylene Ethyl Acetate, Methyl Isobutyl Ketone	3	150	Yes	Y
Laundry Room	Rust Oleum High Performance Protective Enamel	Stoddard solvent, hydrotreated light distillate oil-based paint carbon Black resin	1	150	yes	N
Laundry Room	Systemic Houseplant Insect Control	Imidacloprid	1	150	yes	N
Laundry Room	Raid House and Garden	d-cis, trans allethrin	1	137	yes	Y
Laundry Room	OFF Deep Woods	DEET	1	146	Yes	Y
Laundry Room	Roach and Ant Killer	S-Bioallethrin, Deltamethrin	1	146	yes	Y
Garage	Gunk Liquid Wrench Penetrating	petroleum distillates	1	527	yes	Y
Garage	Multi Purpose Lubricant	petroleum distillate & butoxy-ethanol	1	527	Yes	Y
Garage	WD-40	Petroleum distillate	1	527	yes	Y
Garage	ORC Belt Conditioner	Iso hexane, n-hexane	1	527	Yes	Y
Garage	Oatey PVC cement and primer	MEK, Cyclohexanone, THF, Acetone	4	527	yes	Y
Garage	Turtle wax Chrome polish	NA	1	527	yes	Y
Garage	POR 15 Metal Prep	Phosphoric Acid solution	1	527	yes	Y
Garage	GOOF OFF	VOCs	1	527	yes	Y

2-2-20-19

Product Inventory Form

I.e. gasoline cans/equipment, kerosene, paints/thinners/strippers, cleaning solvents, hobby supplies (glues), oven cleaner, carpet/upholstery cleaners, household cleaners, moth balls, polishes/waxes, insecticides, furniture/floor polish, hairspray, cologne/perfume, air fresheners, interior fuel tank, wood stove/fireplace, new furniture/upholstery, new carpet/flooring

Location	Product Description	Chemical Ingredients	Quantity	PID Reading (ppb)	Photo	Removed (Y/N)
Garage	Bondo-Fiberglass resin	Oxidizer	1	527	Y	Y
Garage	PolyUrethane	Aliphatic hydrocarbons	1	527	Y	Y
Garage	3M Adhesive Remover	Methyl Acetate	1	527	Y	Y
Garage	Brasso - Metal Polish	Petroleum Distillate	1	527	Y	Y
Garage	Turtle Wax - Hard Shell	NA	111	527	Y	Y
Garage	Lock-Ease - lock Fluid	Paraffinic hydrocarbons	1	527	Y	Y
Garage	Perfect Stop - Brake Cleaner	Toluene, heptane, Isopropanol	111	260	Y	Y
Garage	Dupli Color	Acetates, Toluene	11	260	Y	Y
Garage	Liquid Wrench - Silicon spray	Petroleum Distillates	1	260	Y	Y
Garage	Temp Select - Flash	Ethyl Benzene, Naphthalene	1	260	Y	Y
Garage	Minwax wood finish	VOCs	1	260	Y	Y
	~~bondo Fiberglass~~ no					

Analysis Request /Canister Chain of Custody

For Laboratory Use Only
PID: ____________ Workorder #: ________________

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

Click links below to view:
Canister Sampling Guide
Helium Shroud Video

Client: Ford
Project Name: Ford LTP
Project Manager: Kris Hinskey
Sampler: Shantel Johnson
Site Name: 34401 CAPITOL
PID: NA
P.O.# 30016344.0002B

Special Instructions/Notes: Report ONLY: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting

Turnaround Time (Rush surcharges may apply)
5 Day Turnaround Time

Lab ID	**Sample Identification**	**Can #**	**Flow Controller #**	**Start Sampling Information** Date	**Start Sampling Information** Time	**Stop Sampling Information** Date	**Stop Sampling Information** Time	**Canister Vacuum/Pressure** Initial (in Hg)	**Canister Vacuum/Pressure** Final (in Hg)	**Lab Use Only** Receipt	**Lab Use Only** Final (psig) Gas: N_2 / He	**Requested Analyses** TO-15 (See Special Instructions/Notes)	**Requested Analyses** Do Not Analyze		
	SSMP-34401CAPITOLST-01_011520	1L1668	23443	1/15/2020	12:21	1/15/2020	12:32	-29.9	-6			X			
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Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Lab Use Only

Shipper Name:	Custody Seals Intact?	Yes	No	None	

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

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

PID: ____________ Workorder #: ____________

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

Click links below to view:
Canister Sampling Guide
Helium Shroud Video

Client: Ford
Project Name: Ford LTP
Project Manager: Kris Hinskey
Sampler: Madison Olender
Site Name: 34401 CAPITOL

PID: NA
P.O.# 30016344.0002B

Special Instructions/Notes: Report ONLY: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting

Turnaround Time (Rush surcharges may apply)
5 Day Turnaround Time

Lab ID	Sample Identification	Can #	Flow Controller #	Start Sampling Information		Stop Sampling Information		Canister Vacuum/Pressure				Requested Analyses			
				Date	Time	Date	Time	Initial (in Hg)	Final (in Hg)	Lab Use Only: Receipt	Lab Use Only: Final (psig) Gas: N_2 / He	TO-15 (See Special Instructions/Notes)	Do Not Analyze		
	AA-34401CAPITOLST-01_011520	6L1046	20762	1/14/2020	13:08	1/15/2020	12:35	-30	-9			X			
	DUP-34401CAPITOL-01_011520	6L0942	22190	1/14/2020	--	1/15/2020	--	-29.7	-3			X			
	IAG-34401CAPITOLST-01_011520	000002231	22488	1/14/2020	13:13	1/15/2020	12:07	-29.6	-6.5			X			
	IAF-34401CAPITOLST-01_011520	6L2241	22862	1/14/2020	13:18	1/15/2020	12:03	-29.7	-7			X			
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Relinquished by: (Signature/Affiliation)	Date 1-17-20	Time 1600	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Lab Use Only

Shipper Name:	Custody Seals Intact?	Yes No None	

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

ARCADIS

Indoor/Ambient Air Collection Log Sheet

Page 1 of 1

Office Name & Address (Reporting Information): Arcadis of Michigan, LLC 28550 Cabot Drive, Suite 500, Novi, MI 48377	Project Name: Ford LTP Off-site Sampling Project Number: MI001454.0003 / 30016344
Field Manager: Adam Richmond	Site Address: 34401 Capitol
Phone Number: 248.994.2240 Email Address for Result Reporting: Kristoffer.Hinskey@arcadis.com	Special Instructions: Report ONLY: 1,1-DCE, cis-1,2- DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting.
Sampler Name: Madison Olender	
Summa Canister Size (1L, 2.7 L, 6L) 6 Liter	Lab: Eurofins

Sample ID	Sample Location Description	Indoor/ Outdoor	PID in Sampling Area (ppb)	Canister Number	Flow Controller Number	Sample Collection Start Date	Sample Collection Start Time	Beginning Canister Pressure (in. Hg)	Sample Collection End Date	Sample Collection End Time	Ending Canister Pressure (in. Hg)	HVAC System Information						Notes
												HVAC Fan On Start?	HVAC Fan On End?	Heat On Start?	Heat On End?	Temperature Setting (°F) Start	Temperature Setting (°F) End	
AA-34401CAPITOLST-01_011520	SE yard	Outdoor	0	6L1046	20762	1/14/2020	13:08	-30	1/15/2020	12:35	-9	--	--	--	--	--	--	--
DUP-34401CAPITOL-01_011520	Garage	Indoor	632	6L0942	22190	1/14/2020	13:13	-29.7	1/15/2020	12:07	-3	Yes	yes	Yes	Yes	69	70	--
IAG-34401CAPITOLST-01_011520	Garage	Indoor	632	000002231	22488	1/14/2020	13:13	-29.6	1/15/2020	12:07	-6.5	Yes	yes	Yes	Yes	69	70	--
IAF-34401CAPITOLST-01_011520	Living room by TV	Indoor	145	6L2241	22862	1/14/2020	13:18	-29.7	1/15/2020	12:03	-7	Yes	yes	Yes	Yes	69	70	--
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Meteorological Data

Date	Time	Temp. (ºF)		Relative Humidity (%)	Barometric Pressure (in. Hg)	Air Speed (mph)	Source of Weather Information
		Indoor	Outdoor				
1/14/2020	13:30	68	42	77	30.06	WSW 12	weather.com app
1/15/2020	12:35	70	41	67	30.12	SE 8	weather.com app
--	--	--	--	--	--	--	weather.com app
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General Notes or Observations

Resident stated

ARCADIS

Soil Vapor Collection Log Sheet

Page ____1___ of ____1____

Office Name & Address (Reporting Information): Arcadis of Michigan, LLC 28550 Cabot Drive, Suite 500, Novi, MI 48377		Project Name: Ford LTP Off-site Sampling Project Number: MI001454.0003 / 30016344	
Field Manager: Adam Richmond		Site Address: 34401 Capitol	
Phone Number: 248.994.2240	Special Instructions: Report ONLY: 1,1-DCE, cis-1,2- DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting.		
Email Address for Result Reporting: Kristoffer.Hinskey@arcadis.com		Sampler Name: Shantel Johnson	
Helium Detector Model Used: Dielectric MGD-2002	Helium Leak Test Method: Bucket Shroud	Summa Canister Size (1L, 2.7 L, 6L): 1 Liter	Lab: Eurofins

Sample ID	Sample Location Description	Date	Pre-Sampling Shut-In / Leak-Down Test Pass/Fail?	Helium Tracer Test - Performed During Sample Point Purge			Purge Volume (mL)	Purge Rate (mL/min)	Canister Number	Flow Controller Number	Sample Collection Start Time	Starting Canister Pressure (in. Hg)	Sample Collection End Time	Ending Canister Pressure (in. Hg)	Post-Sampling CO_2 Reading from GEM (%)	Post-Sampling O_2 Reading from GEM (%)	Micromanometer Reading (in. WC)
				Shroud Helium Concentration During Purge (% Helium)	Helium Reading in Purged Vapor (% Helium)	Helium Test Pass/Fail (Purge contains <5% of shroud to pass)?											
SSMP-34401CAPITOLST-01_011520	Garage	1/15/2020	Pass	63.2	0	Pass	100	100	1L1668	23443	12:21	-29.9	12:32	-6	7	15.5	0.00056
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Meteorological Data

Date	Time	Temp. (ºF)		Relative Humidity (%)	Barometric Pressure (in. Hg)	Source of Weather Information
		Indoor	Outdoor			
1/15/2020	12:08	69	42	64	30.05	weather.com app
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Purge Volume Calculations:

The purge volume for each sample has been pre-calculated using the information below.

For sub-slab soil vapor samples the sample train tubing length is ~54 inches and the interior tubing radius is 0.085".
Three volumes of the sample train is 60 milliliters using the equation for volume of a cylinder (volume = pi * radius^2 * height) where Volume = 60 ml, radius = 0.85" and height = 54".
To have sufficient volume to conduct helium leak testing 100 milliliters should be purged from each sample point.

For exterior soil vapor sampling 60 milliliters should be used for the above ground sample train.
Each additional foot of sub-grade tubing account for approximately 13 ml.
To have sufficient volume to conduct helium leak testing at least 100 milliliters should be purged from each sample point.

General Notes or Observations