AECOM
100 N. Broadway
20th Floor
St. Louis, MO 63102
www.aecom.com

314 429 0100 tel.
314 429 0462 fax

November 13, 2019

Illinois Department of Transportation
Kirk H. Brown, PE
Project Support Engineer
Division of Highways/Region 5/District 8
1102 Eastport Plaza Drive
Collinsville, Illinois 62234-6198

Subject: Analytical Data for Soil Vapor Sampling According to Illinois Department of Transportation (IDOT) Permits No. 8-28548 and No. 8-28875

Dear Mr. Brown,

AECOM, on behalf of Shell Oil Products US (SOPUS), is submitting the attached analytical results for soil vapor samples collected from the following vapor monitoring points in accordance with IDOT Permits No. 8-28548 and No. 8-28875:

- VMP-15
- VMP-55

If you have any questions or require further information, please contact Robert Mooshegian at robert.mooshegian@aecom.com (314/802-1185) or Samuel Fisher at samuel.fisher@aecom.com (314/802-1152).

Sincerely,
AECOM, on behalf of Shell Oil Products US

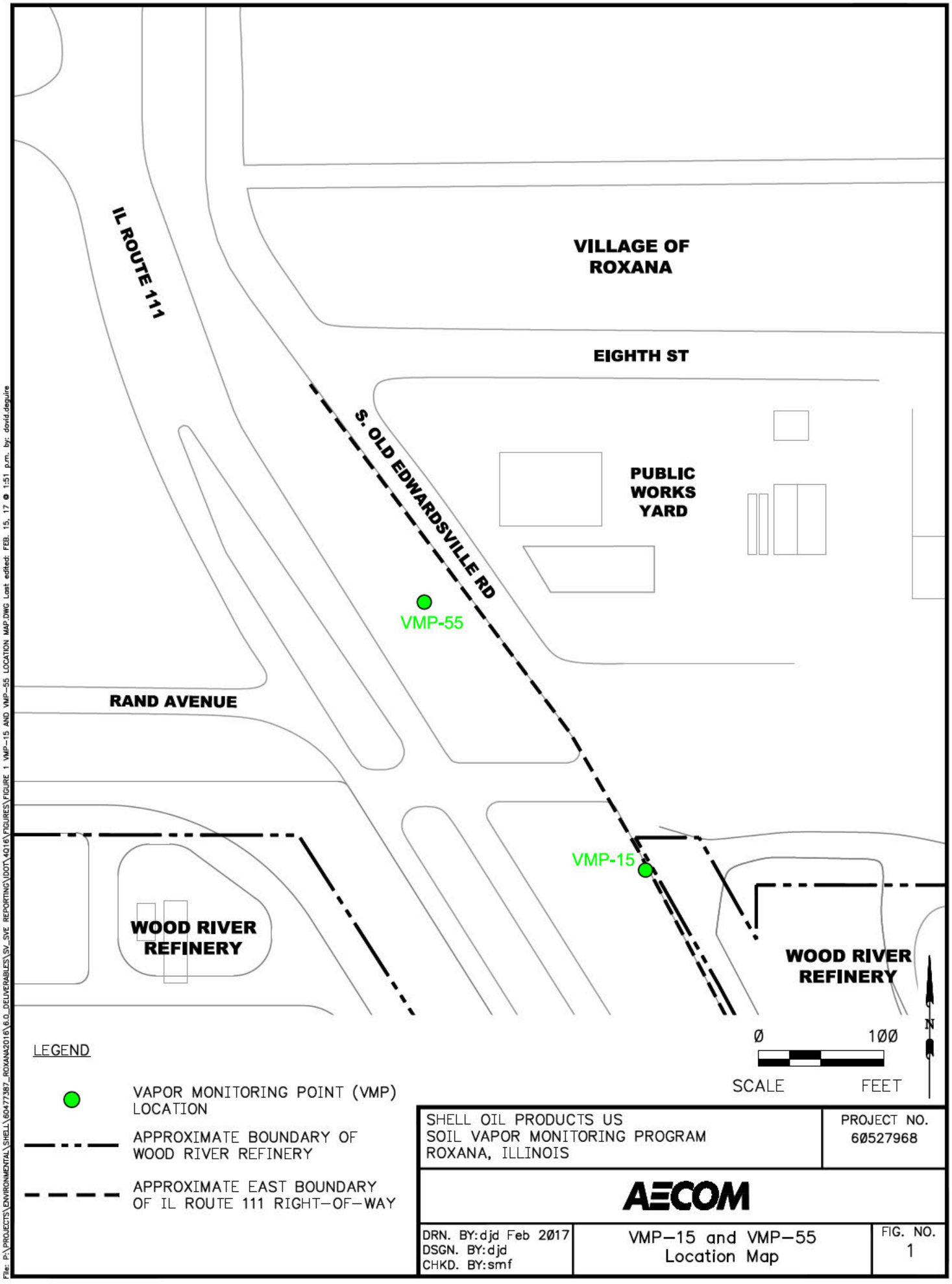
Samuel Fisher
Environmental Scientist

Robert E. Mooshegian, STS
Senior Program Manager

Attachments

cc: Kevin Dyer, SOPUS
Dan Kirk, SOPUS
Repositories – Roxana Public Library, Website
Project File

This page intentionally left blank



SHELL OIL PRODUCTS US
SOIL VAPOR MONITORING PROGRAM
ROXANA, ILLINOIS

PROJECT NO.
60527968

AECOM

DRN. BY: djd Feb 2017
DSGN. BY: djd
CHKD. BY: smf

VMP-15 and VMP-55
Location Map

FIG. NO.
1

File: P:\PROJECTS\ENVIRONMENTAL\SHELL\60477387_ROXANA2016\6.0_DELIVERABLES\SV_SVE REPORTING\IDOT\4Q16\FIGURES\FIGURE 1 VMP-15 AND VMP-55 LOCATION MAP.DWG Last edited: FEB. 15, 17 @ 1:51 p.m. by: dovid.depuire

This page intentionally left blank

eurofins | Air Toxics

8/28/2019
Ms. Elizabeth Kunkel
AECOM
100 N. Broadway, 20th Floor

St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60592794-1.04.003
Workorder #: 1907698AR1

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 7/31/2019 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: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1907698AR1

Work Order Summary

CLIENT:	Ms. Elizabeth Kunkel AECOM 100 N. Broadway, 20th Floor St. Louis, MO 63102	**BILL TO:**	Accounts Payable Austin AECOM PO Box 203970 Austin, TX 78720
PHONE:	314-802-1171	**P.O. #**	110116ACM
FAX:		**PROJECT #**	60592794-1.04.003 Roxana Quarterly Soil Vapor
DATE RECEIVED:	07/31/2019	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	08/13/2019		
DATE REISSUED:	08/28/2019		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-073019	TO-15	5.5 "Hg	15 psi
02A	VMP-15-5-073019-DUP	TO-15	5.0 "Hg	15 psi
03A	VMP-15-21.5-073019	TO-15	7.5 "Hg	15 psi
03B	VMP-15-21.5-073019	TO-15	7.5 "Hg	15 psi
04A	VMP-55-20-073019	TO-15	5.5 "Hg	15 psi
04B	VMP-55-20-073019	TO-15	5.5 "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: Heidi Hayes DATE: 08/28/19

Technical Director

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: 10/18/2018, Expiration date: 10/17/2019.
Eurofins Air Toxics Inc.. 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) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
AECOM
Workorder# 1907698AR1

Four 1 Liter Summa Canister samples were received on July 31, 2019. 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 may be false positives.

Dilution was performed on samples VMP-15-21.5-073019 and VMP-55-20-073019 due to the presence of high level target species.

Due to high-level target compounds, sample VMP-15-21.5-073019 and VMP-55-20-073019 were analyzed twice. In the "A" fraction, the sample was diluted to bring the highest-level compounds within the calibration range. The "B" fraction is also reported by client request and may be reported with "E" flags indicating the compound exceeds the calibration range. Both runs and associated QC are reported.

Due to laboratory error, the workorder was reissued on 8/28/2019 to correctly report misidentified compound 1,2-Dibromoethane in sample VMP-15-21.5-073019 (03B) as not detected.

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

eurofins | Air Toxics

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VMP-15-5-073019

Lab ID#: 1907698AR1-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.77 J	6.1	3.8 J
Freon 114	1.2	0.32 J	8.6	2.2 J
Freon 11	1.2	0.58 J	6.9	3.2 J
Freon 113	1.2	0.44 J	9.5	3.4 J
Acetone	12	17	29	40
2-Propanol	4.9	4.1 J	12	10 J
1,1-Dichloroethane	1.2	0.27 J	5.0	1.1 J
Chloroform	1.2	0.44 J	6.0	2.2 J
1,1,1-Trichloroethane	1.2	0.32 J	6.7	1.7 J
Carbon Tetrachloride	1.2	0.30 J	7.8	1.9 J
2,2,4-Trimethylpentane	1.2	0.36 J	5.8	1.7 J
Benzene	1.2	0.70 J	3.9	2.2 J
Toluene	1.2	1.2 J	4.6	4.4 J
Dibromochloromethane	1.2	0.16 J	10	1.4 J
Ethyl Benzene	1.2	0.35 J	5.4	1.5 J
m,p-Xylene	1.2	0.38 J	5.4	1.6 J
1,1,2,2-Tetrachloroethane	1.2	0.36 J	8.5	2.5 J
1,4-Dichlorobenzene	1.2	0.22 J	7.4	1.3 J

Client Sample ID: VMP-15-5-073019-DUP

Lab ID#: 1907698AR1-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.51 J	6.0	2.5 J
Chloromethane	12	3.4 J	25	7.0 J
Freon 11	1.2	0.29 J	6.8	1.6 J
Acetone	12	35	29	82
Chloroform	1.2	0.34 J	5.9	1.7 J

Client Sample ID: VMP-15-21.5-073019

Lab ID#: 1907698AR1-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)

eurofins | Air Toxics

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VMP-15-21.5-073019

Lab ID#: 1907698AR1-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2,2,4-Trimethylpentane	27	5800	120	27000
Butane	110	400	260	950
Isopentane	110	990	320	2900

Client Sample ID: VMP-15-21.5-073019

Lab ID#: 1907698AR1-03B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Cyclohexane	9.0	12	31	42
2,2,4-Trimethylpentane	9.0	6300 E	42	29000 E
2-Hexanone	36	23 J	150	94 J
Butane	36	380	86	910
Isopentane	36	970	110	2900

Client Sample ID: VMP-55-20-073019

Lab ID#: 1907698AR1-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2,2,4-Trimethylpentane	25	6200	120	29000
Bromodichloromethane	25	130	160	860

Client Sample ID: VMP-55-20-073019

Lab ID#: 1907698AR1-04B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	33	9.7 J	120	35 J
2,2,4-Trimethylpentane	8.2	6900 E	38	32000 E
Toluene	8.2	11	31	42
Isopentane	33	28 J	97	82 J

eurofins | Air Toxics

Client Sample ID: VMP-15-5-073019

Lab ID#: 1907698AR1-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080209**	**Date of Collection:**	**7/30/19 8:38:00 AM**
Dil. Factor:	**2.47**	**Date of Analysis:**	**8/2/19 04:52 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.77 J	6.1	3.8 J
Freon 114	1.2	0.32 J	8.6	2.2 J
Chloromethane	12	Not Detected	26	Not Detected
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
1,3-Butadiene	1.2	Not Detected	2.7	Not Detected
Bromomethane	12	Not Detected	48	Not Detected
Chloroethane	4.9	Not Detected	13	Not Detected
Freon 11	1.2	0.58 J	6.9	3.2 J
Ethanol	4.9	Not Detected	9.3	Not Detected
Freon 113	1.2	0.44 J	9.5	3.4 J
1,1-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Acetone	12	17	29	40
2-Propanol	4.9	4.1 J	12	10 J
Carbon Disulfide	4.9	Not Detected	15	Not Detected
3-Chloropropene	4.9	Not Detected	15	Not Detected
Methylene Chloride	12	Not Detected	43	Not Detected
Methyl tert-butyl ether	4.9	Not Detected	18	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Hexane	1.2	Not Detected	4.4	Not Detected
1,1-Dichloroethane	1.2	0.27 J	5.0	1.1 J
2-Butanone (Methyl Ethyl Ketone)	4.9	Not Detected	14	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.6	Not Detected
Chloroform	1.2	0.44 J	6.0	2.2 J
1,1,1-Trichloroethane	1.2	0.32 J	6.7	1.7 J
Cyclohexane	1.2	Not Detected	4.2	Not Detected
Carbon Tetrachloride	1.2	0.30 J	7.8	1.9 J
2,2,4-Trimethylpentane	1.2	0.36 J	5.8	1.7 J
Benzene	1.2	0.70 J	3.9	2.2 J
1,2-Dichloroethane	1.2	Not Detected	5.0	Not Detected
Heptane	1.2	Not Detected	5.1	Not Detected
Trichloroethene	1.2	Not Detected	6.6	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.7	Not Detected
1,4-Dioxane	4.9	Not Detected	18	Not Detected
Bromodichloromethane	1.2	Not Detected	8.3	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	5.0	Not Detected
Toluene	1.2	1.2 J	4.6	4.4 J
trans-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.7	Not Detected
Tetrachloroethene	1.2	Not Detected	8.4	Not Detected
2-Hexanone	4.9	Not Detected	20	Not Detected

eurofins | Air Toxics

Client Sample ID: VMP-15-5-073019

Lab ID#: 1907698AR1-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080209**	**Date of Collection: 7/30/19 8:38:00 AM**	
Dil. Factor:	**2.47**	**Date of Analysis: 8/2/19 04:52 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	0.16 J	10	1.4 J
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.5	Not Detected
Chlorobenzene	1.2	Not Detected	5.7	Not Detected
Ethyl Benzene	1.2	0.35 J	5.4	1.5 J
m,p-Xylene	1.2	0.38 J	5.4	1.6 J
o-Xylene	1.2	Not Detected	5.4	Not Detected
Styrene	1.2	Not Detected	5.3	Not Detected
Bromoform	1.2	Not Detected	13	Not Detected
Cumene	1.2	Not Detected	6.1	Not Detected
1,1,2,2-Tetrachloroethane	1.2	0.36 J	8.5	2.5 J
Propylbenzene	1.2	Not Detected	6.1	Not Detected
4-Ethyltoluene	1.2	Not Detected	6.1	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	6.1	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	6.1	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,4-Dichlorobenzene	1.2	0.22 J	7.4	1.3 J
alpha-Chlorotoluene	1.2	Not Detected	6.4	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,2,4-Trichlorobenzene	4.9	Not Detected	37	Not Detected
Hexachlorobutadiene	4.9	Not Detected	53	Not Detected
Butane	4.9	Not Detected	12	Not Detected
Isopentane	4.9	Not Detected	14	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	90	70-130

eurofins | Air Toxics

Client Sample ID: VMP-15-5-073019-DUP

Lab ID#: 1907698AR1-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080210**	**Date of Collection:**	**7/30/19 8:38:00 AM**
Dil. Factor:	**2.42**	**Date of Analysis:**	**8/2/19 05:19 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.51 J	6.0	2.5 J
Freon 114	1.2	Not Detected	8.4	Not Detected
Chloromethane	12	3.4 J	25	7.0 J
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,3-Butadiene	1.2	Not Detected	2.7	Not Detected
Bromomethane	12	Not Detected	47	Not Detected
Chloroethane	4.8	Not Detected	13	Not Detected
Freon 11	1.2	0.29 J	6.8	1.6 J
Ethanol	4.8	Not Detected	9.1	Not Detected
Freon 113	1.2	Not Detected	9.3	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	35	29	82
2-Propanol	4.8	Not Detected	12	Not Detected
Carbon Disulfide	4.8	Not Detected	15	Not Detected
3-Chloropropene	4.8	Not Detected	15	Not Detected
Methylene Chloride	12	Not Detected	42	Not Detected
Methyl tert-butyl ether	4.8	Not Detected	17	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Hexane	1.2	Not Detected	4.3	Not Detected
1,1-Dichloroethane	1.2	Not Detected	4.9	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.8	Not Detected	14	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.6	Not Detected
Chloroform	1.2	0.34 J	5.9	1.7 J
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
Cyclohexane	1.2	Not Detected	4.2	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.6	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.6	Not Detected
Benzene	1.2	Not Detected	3.9	Not Detected
1,2-Dichloroethane	1.2	Not Detected	4.9	Not Detected
Heptane	1.2	Not Detected	5.0	Not Detected
Trichloroethene	1.2	Not Detected	6.5	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.6	Not Detected
1,4-Dioxane	4.8	Not Detected	17	Not Detected
Bromodichloromethane	1.2	Not Detected	8.1	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.5	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	5.0	Not Detected
Toluene	1.2	Not Detected	4.6	Not Detected
trans-1,3-Dichloropropene	1.2	Not Detected	5.5	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.6	Not Detected
Tetrachloroethene	1.2	Not Detected	8.2	Not Detected
2-Hexanone	4.8	Not Detected	20	Not Detected

eurofins | Air Toxics

Client Sample ID: VMP-15-5-073019-DUP

Lab ID#: 1907698AR1-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080210**	**Date of Collection: 7/30/19 8:38:00 AM**	
Dil. Factor:	**2.42**	**Date of Analysis: 8/2/19 05:19 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	Not Detected	10	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.3	Not Detected
Chlorobenzene	1.2	Not Detected	5.6	Not Detected
Ethyl Benzene	1.2	Not Detected	5.2	Not Detected
m,p-Xylene	1.2	Not Detected	5.2	Not Detected
o-Xylene	1.2	Not Detected	5.2	Not Detected
Styrene	1.2	Not Detected	5.2	Not Detected
Bromoform	1.2	Not Detected	12	Not Detected
Cumene	1.2	Not Detected	5.9	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.3	Not Detected
Propylbenzene	1.2	Not Detected	5.9	Not Detected
4-Ethyltoluene	1.2	Not Detected	5.9	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	5.9	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	5.9	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.3	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,2,4-Trichlorobenzene	4.8	Not Detected	36	Not Detected
Hexachlorobutadiene	4.8	Not Detected	52	Not Detected
Butane	4.8	Not Detected	12	Not Detected
Isopentane	4.8	Not Detected	14	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	89	70-130

eurofins | Air Toxics

Client Sample ID: VMP-15-21.5-073019

Lab ID#: 1907698AR1-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080225**	**Date of Collection:**	**7/30/19 8:54:00 AM**
Dil. Factor:	**53.9**	**Date of Analysis:**	**8/3/19 01:44 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	27	Not Detected	130	Not Detected
Freon 114	27	Not Detected	190	Not Detected
Chloromethane	270	Not Detected	560	Not Detected
Vinyl Chloride	27	Not Detected	69	Not Detected
1,3-Butadiene	27	Not Detected	60	Not Detected
Bromomethane	270	Not Detected	1000	Not Detected
Chloroethane	110	Not Detected	280	Not Detected
Freon 11	27	Not Detected	150	Not Detected
Ethanol	110	Not Detected	200	Not Detected
Freon 113	27	Not Detected	210	Not Detected
1,1-Dichloroethene	27	Not Detected	110	Not Detected
Acetone	270	Not Detected	640	Not Detected
2-Propanol	110	Not Detected	260	Not Detected
Carbon Disulfide	110	Not Detected	340	Not Detected
3-Chloropropene	110	Not Detected	340	Not Detected
Methylene Chloride	270	Not Detected	940	Not Detected
Methyl tert-butyl ether	110	Not Detected	390	Not Detected
trans-1,2-Dichloroethene	27	Not Detected	110	Not Detected
Hexane	27	Not Detected	95	Not Detected
1,1-Dichloroethane	27	Not Detected	110	Not Detected
2-Butanone (Methyl Ethyl Ketone)	110	Not Detected	320	Not Detected
cis-1,2-Dichloroethene	27	Not Detected	110	Not Detected
Tetrahydrofuran	27	Not Detected	79	Not Detected
Chloroform	27	Not Detected	130	Not Detected
1,1,1-Trichloroethane	27	Not Detected	150	Not Detected
Cyclohexane	27	Not Detected	93	Not Detected
Carbon Tetrachloride	27	Not Detected	170	Not Detected
2,2,4-Trimethylpentane	27	5800	120	27000
Benzene	27	Not Detected	86	Not Detected
1,2-Dichloroethane	27	Not Detected	110	Not Detected
Heptane	27	Not Detected	110	Not Detected
Trichloroethene	27	Not Detected	140	Not Detected
1,2-Dichloropropane	27	Not Detected	120	Not Detected
1,4-Dioxane	110	Not Detected	390	Not Detected
Bromodichloromethane	27	Not Detected	180	Not Detected
cis-1,3-Dichloropropene	27	Not Detected	120	Not Detected
4-Methyl-2-pentanone	27	Not Detected	110	Not Detected
Toluene	27	Not Detected	100	Not Detected
trans-1,3-Dichloropropene	27	Not Detected	120	Not Detected
1,1,2-Trichloroethane	27	Not Detected	150	Not Detected
Tetrachloroethene	27	Not Detected	180	Not Detected
2-Hexanone	110	Not Detected	440	Not Detected

eurofins | Air Toxics

Client Sample ID: VMP-15-21.5-073019

Lab ID#: 1907698AR1-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080225**	**Date of Collection:**	**7/30/19 8:54:00 AM**
Dil. Factor:	**53.9**	**Date of Analysis:**	**8/3/19 01:44 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	27	Not Detected	230	Not Detected
1,2-Dibromoethane (EDB)	27	Not Detected	210	Not Detected
Chlorobenzene	27	Not Detected	120	Not Detected
Ethyl Benzene	27	Not Detected	120	Not Detected
m,p-Xylene	27	Not Detected	120	Not Detected
o-Xylene	27	Not Detected	120	Not Detected
Styrene	27	Not Detected	110	Not Detected
Bromoform	27	Not Detected	280	Not Detected
Cumene	27	Not Detected	130	Not Detected
1,1,2,2-Tetrachloroethane	27	Not Detected	180	Not Detected
Propylbenzene	27	Not Detected	130	Not Detected
4-Ethyltoluene	27	Not Detected	130	Not Detected
1,3,5-Trimethylbenzene	27	Not Detected	130	Not Detected
1,2,4-Trimethylbenzene	27	Not Detected	130	Not Detected
1,3-Dichlorobenzene	27	Not Detected	160	Not Detected
1,4-Dichlorobenzene	27	Not Detected	160	Not Detected
alpha-Chlorotoluene	27	Not Detected	140	Not Detected
1,2-Dichlorobenzene	27	Not Detected	160	Not Detected
1,2,4-Trichlorobenzene	110	Not Detected	800	Not Detected
Hexachlorobutadiene	110	Not Detected	1100	Not Detected
Butane	110	400	260	950
Isopentane	110	990	320	2900

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	115	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	93	70-130

eurofins | Air Toxics

Client Sample ID: VMP-15-21.5-073019

Lab ID#: 1907698AR1-03B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080213r1**	**Date of Collection:**	**7/30/19 8:54:00 AM**
Dil. Factor:	**18.0**	**Date of Analysis:**	**8/2/19 06:42 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	9.0	Not Detected	44	Not Detected
Freon 114	9.0	Not Detected	63	Not Detected
Chloromethane	90	Not Detected	180	Not Detected
Vinyl Chloride	9.0	Not Detected	23	Not Detected
1,3-Butadiene	9.0	Not Detected	20	Not Detected
Bromomethane	90	Not Detected	350	Not Detected
Chloroethane	36	Not Detected	95	Not Detected
Freon 11	9.0	Not Detected	50	Not Detected
Ethanol	36	Not Detected	68	Not Detected
Freon 113	9.0	Not Detected	69	Not Detected
1,1-Dichloroethene	9.0	Not Detected	36	Not Detected
Acetone	90	Not Detected	210	Not Detected
2-Propanol	36	Not Detected	88	Not Detected
Carbon Disulfide	36	Not Detected	110	Not Detected
3-Chloropropene	36	Not Detected	110	Not Detected
Methylene Chloride	90	Not Detected	310	Not Detected
Methyl tert-butyl ether	36	Not Detected	130	Not Detected
trans-1,2-Dichloroethene	9.0	Not Detected	36	Not Detected
Hexane	9.0	Not Detected	32	Not Detected
1,1-Dichloroethane	9.0	Not Detected	36	Not Detected
2-Butanone (Methyl Ethyl Ketone)	36	Not Detected	110	Not Detected
cis-1,2-Dichloroethene	9.0	Not Detected	36	Not Detected
Tetrahydrofuran	9.0	Not Detected	26	Not Detected
Chloroform	9.0	Not Detected	44	Not Detected
1,1,1-Trichloroethane	9.0	Not Detected	49	Not Detected
Cyclohexane	9.0	12	31	42
Carbon Tetrachloride	9.0	Not Detected	57	Not Detected
2,2,4-Trimethylpentane	9.0	6300 E	42	29000 E
Benzene	9.0	Not Detected	29	Not Detected
1,2-Dichloroethane	9.0	Not Detected	36	Not Detected
Heptane	9.0	Not Detected	37	Not Detected
Trichloroethene	9.0	Not Detected	48	Not Detected
1,2-Dichloropropane	9.0	Not Detected	42	Not Detected
1,4-Dioxane	36	Not Detected	130	Not Detected
Bromodichloromethane	9.0	Not Detected	60	Not Detected
cis-1,3-Dichloropropene	9.0	Not Detected	41	Not Detected
4-Methyl-2-pentanone	9.0	Not Detected	37	Not Detected
Toluene	9.0	Not Detected	34	Not Detected
trans-1,3-Dichloropropene	9.0	Not Detected	41	Not Detected
1,1,2-Trichloroethane	9.0	Not Detected	49	Not Detected
Tetrachloroethene	9.0	Not Detected	61	Not Detected
2-Hexanone	36	23 J	150	94 J

eurofins | Air Toxics

Client Sample ID: VMP-15-21.5-073019

Lab ID#: 1907698AR1-03B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080213r1**	**Date of Collection: 7/30/19 8:54:00 AM**	
Dil. Factor:	**18.0**	**Date of Analysis: 8/2/19 06:42 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	9.0	Not Detected	77	Not Detected
1,2-Dibromoethane (EDB)	9.0	Not Detected	69	Not Detected
Chlorobenzene	9.0	Not Detected	41	Not Detected
Ethyl Benzene	9.0	Not Detected	39	Not Detected
m,p-Xylene	9.0	Not Detected	39	Not Detected
o-Xylene	9.0	Not Detected	39	Not Detected
Styrene	9.0	Not Detected	38	Not Detected
Bromoform	9.0	Not Detected	93	Not Detected
Cumene	9.0	Not Detected	44	Not Detected
1,1,2,2-Tetrachloroethane	9.0	Not Detected	62	Not Detected
Propylbenzene	9.0	Not Detected	44	Not Detected
4-Ethyltoluene	9.0	Not Detected	44	Not Detected
1,3,5-Trimethylbenzene	9.0	Not Detected	44	Not Detected
1,2,4-Trimethylbenzene	9.0	Not Detected	44	Not Detected
1,3-Dichlorobenzene	9.0	Not Detected	54	Not Detected
1,4-Dichlorobenzene	9.0	Not Detected	54	Not Detected
alpha-Chlorotoluene	9.0	Not Detected	46	Not Detected
1,2-Dichlorobenzene	9.0	Not Detected	54	Not Detected
1,2,4-Trichlorobenzene	36	Not Detected	270	Not Detected
Hexachlorobutadiene	36	Not Detected	380	Not Detected
Butane	36	380	86	910
Isopentane	36	970	110	2900

E = Exceeds instrument calibration range.
J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	116	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	97	70-130

eurofins | Air Toxics

Client Sample ID: VMP-55-20-073019

Lab ID#: 1907698AR1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080226**	**Date of Collection:**	**7/30/19 9:39:00 AM**
Dil. Factor:	**49.5**	**Date of Analysis:**	**8/3/19 02:10 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	25	Not Detected	120	Not Detected
Freon 114	25	Not Detected	170	Not Detected
Chloromethane	250	Not Detected	510	Not Detected
Vinyl Chloride	25	Not Detected	63	Not Detected
1,3-Butadiene	25	Not Detected	55	Not Detected
Bromomethane	250	Not Detected	960	Not Detected
Chloroethane	99	Not Detected	260	Not Detected
Freon 11	25	Not Detected	140	Not Detected
Ethanol	99	Not Detected	190	Not Detected
Freon 113	25	Not Detected	190	Not Detected
1,1-Dichloroethene	25	Not Detected	98	Not Detected
Acetone	250	Not Detected	590	Not Detected
2-Propanol	99	Not Detected	240	Not Detected
Carbon Disulfide	99	Not Detected	310	Not Detected
3-Chloropropene	99	Not Detected	310	Not Detected
Methylene Chloride	250	Not Detected	860	Not Detected
Methyl tert-butyl ether	99	Not Detected	360	Not Detected
trans-1,2-Dichloroethene	25	Not Detected	98	Not Detected
Hexane	25	Not Detected	87	Not Detected
1,1-Dichloroethane	25	Not Detected	100	Not Detected
2-Butanone (Methyl Ethyl Ketone)	99	Not Detected	290	Not Detected
cis-1,2-Dichloroethene	25	Not Detected	98	Not Detected
Tetrahydrofuran	25	Not Detected	73	Not Detected
Chloroform	25	Not Detected	120	Not Detected
1,1,1-Trichloroethane	25	Not Detected	140	Not Detected
Cyclohexane	25	Not Detected	85	Not Detected
Carbon Tetrachloride	25	Not Detected	160	Not Detected
2,2,4-Trimethylpentane	25	6200	120	29000
Benzene	25	Not Detected	79	Not Detected
1,2-Dichloroethane	25	Not Detected	100	Not Detected
Heptane	25	Not Detected	100	Not Detected
Trichloroethene	25	Not Detected	130	Not Detected
1,2-Dichloropropane	25	Not Detected	110	Not Detected
1,4-Dioxane	99	Not Detected	360	Not Detected
Bromodichloromethane	25	130	160	860
cis-1,3-Dichloropropene	25	Not Detected	110	Not Detected
4-Methyl-2-pentanone	25	Not Detected	100	Not Detected
Toluene	25	Not Detected	93	Not Detected
trans-1,3-Dichloropropene	25	Not Detected	110	Not Detected
1,1,2-Trichloroethane	25	Not Detected	140	Not Detected
Tetrachloroethene	25	Not Detected	170	Not Detected
2-Hexanone	99	Not Detected	400	Not Detected

eurofins | Air Toxics

Client Sample ID: VMP-55-20-073019

Lab ID#: 1907698AR1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080226**	**Date of Collection: 7/30/19 9:39:00 AM**	
Dil. Factor:	**49.5**	**Date of Analysis: 8/3/19 02:10 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	25	Not Detected	210	Not Detected
1,2-Dibromoethane (EDB)	25	Not Detected	190	Not Detected
Chlorobenzene	25	Not Detected	110	Not Detected
Ethyl Benzene	25	Not Detected	110	Not Detected
m,p-Xylene	25	Not Detected	110	Not Detected
o-Xylene	25	Not Detected	110	Not Detected
Styrene	25	Not Detected	100	Not Detected
Bromoform	25	Not Detected	260	Not Detected
Cumene	25	Not Detected	120	Not Detected
1,1,2,2-Tetrachloroethane	25	Not Detected	170	Not Detected
Propylbenzene	25	Not Detected	120	Not Detected
4-Ethyltoluene	25	Not Detected	120	Not Detected
1,3,5-Trimethylbenzene	25	Not Detected	120	Not Detected
1,2,4-Trimethylbenzene	25	Not Detected	120	Not Detected
1,3-Dichlorobenzene	25	Not Detected	150	Not Detected
1,4-Dichlorobenzene	25	Not Detected	150	Not Detected
alpha-Chlorotoluene	25	Not Detected	130	Not Detected
1,2-Dichlorobenzene	25	Not Detected	150	Not Detected
1,2,4-Trichlorobenzene	99	Not Detected	730	Not Detected
Hexachlorobutadiene	99	Not Detected	1000	Not Detected
Butane	99	Not Detected	240	Not Detected
Isopentane	99	Not Detected	290	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	112	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	99	70-130

eurofins | Air Toxics

Client Sample ID: VMP-55-20-073019

Lab ID#: 1907698AR1-04B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080214**	**Date of Collection:**	**7/30/19 9:39:00 AM**
Dil. Factor:	**16.5**	**Date of Analysis:**	**8/2/19 07:09 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	8.2	Not Detected	41	Not Detected
Freon 114	8.2	Not Detected	58	Not Detected
Chloromethane	82	Not Detected	170	Not Detected
Vinyl Chloride	8.2	Not Detected	21	Not Detected
1,3-Butadiene	8.2	Not Detected	18	Not Detected
Bromomethane	82	Not Detected	320	Not Detected
Chloroethane	33	Not Detected	87	Not Detected
Freon 11	8.2	Not Detected	46	Not Detected
Ethanol	33	Not Detected	62	Not Detected
Freon 113	8.2	Not Detected	63	Not Detected
1,1-Dichloroethene	8.2	Not Detected	33	Not Detected
Acetone	82	Not Detected	200	Not Detected
2-Propanol	33	Not Detected	81	Not Detected
Carbon Disulfide	33	Not Detected	100	Not Detected
3-Chloropropene	33	Not Detected	100	Not Detected
Methylene Chloride	82	Not Detected	290	Not Detected
Methyl tert-butyl ether	33	9.7 J	120	35 J
trans-1,2-Dichloroethene	8.2	Not Detected	33	Not Detected
Hexane	8.2	Not Detected	29	Not Detected
1,1-Dichloroethane	8.2	Not Detected	33	Not Detected
2-Butanone (Methyl Ethyl Ketone)	33	Not Detected	97	Not Detected
cis-1,2-Dichloroethene	8.2	Not Detected	33	Not Detected
Tetrahydrofuran	8.2	Not Detected	24	Not Detected
Chloroform	8.2	Not Detected	40	Not Detected
1,1,1-Trichloroethane	8.2	Not Detected	45	Not Detected
Cyclohexane	8.2	Not Detected	28	Not Detected
Carbon Tetrachloride	8.2	Not Detected	52	Not Detected
2,2,4-Trimethylpentane	8.2	6900 E	38	32000 E
Benzene	8.2	Not Detected	26	Not Detected
1,2-Dichloroethane	8.2	Not Detected	33	Not Detected
Heptane	8.2	Not Detected	34	Not Detected
Trichloroethene	8.2	Not Detected	44	Not Detected
1,2-Dichloropropane	8.2	Not Detected	38	Not Detected
1,4-Dioxane	33	Not Detected	120	Not Detected
Bromodichloromethane	8.2	Not Detected	55	Not Detected
cis-1,3-Dichloropropene	8.2	Not Detected	37	Not Detected
4-Methyl-2-pentanone	8.2	Not Detected	34	Not Detected
Toluene	8.2	11	31	42
trans-1,3-Dichloropropene	8.2	Not Detected	37	Not Detected
1,1,2-Trichloroethane	8.2	Not Detected	45	Not Detected
Tetrachloroethene	8.2	Not Detected	56	Not Detected
2-Hexanone	33	Not Detected	140	Not Detected

eurofins | Air Toxics

Client Sample ID: VMP-55-20-073019

Lab ID#: 1907698AR1-04B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080214**	**Date of Collection: 7/30/19 9:39:00 AM**	
Dil. Factor:	**16.5**	**Date of Analysis: 8/2/19 07:09 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	8.2	Not Detected	70	Not Detected
1,2-Dibromoethane (EDB)	8.2	Not Detected	63	Not Detected
Chlorobenzene	8.2	Not Detected	38	Not Detected
Ethyl Benzene	8.2	Not Detected	36	Not Detected
m,p-Xylene	8.2	Not Detected	36	Not Detected
o-Xylene	8.2	Not Detected	36	Not Detected
Styrene	8.2	Not Detected	35	Not Detected
Bromoform	8.2	Not Detected	85	Not Detected
Cumene	8.2	Not Detected	40	Not Detected
1,1,2,2-Tetrachloroethane	8.2	Not Detected	57	Not Detected
Propylbenzene	8.2	Not Detected	40	Not Detected
4-Ethyltoluene	8.2	Not Detected	40	Not Detected
1,3,5-Trimethylbenzene	8.2	Not Detected	40	Not Detected
1,2,4-Trimethylbenzene	8.2	Not Detected	40	Not Detected
1,3-Dichlorobenzene	8.2	Not Detected	50	Not Detected
1,4-Dichlorobenzene	8.2	Not Detected	50	Not Detected
alpha-Chlorotoluene	8.2	Not Detected	43	Not Detected
1,2-Dichlorobenzene	8.2	Not Detected	50	Not Detected
1,2,4-Trichlorobenzene	33	Not Detected	240	Not Detected
Hexachlorobutadiene	33	Not Detected	350	Not Detected
Butane	33	Not Detected	78	Not Detected
Isopentane	33	28 J	97	82 J

J = Estimated value.
E = Exceeds instrument calibration range.
Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	108	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	99	70-130

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1907698AR1-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080208a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/2/19 03:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	2.0	Not Detected	7.2	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	0.18 J	3.4	1.2 J
2-Hexanone	2.0	Not Detected	8.2	Not Detected

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1907698AR1-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080208a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/2/19 03:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected
Butane	2.0	Not Detected	4.8	Not Detected
Isopentane	2.0	Not Detected	5.9	Not Detected

J = Estimated value.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	90	70-130

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 1907698AR1-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080205**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 8/2/19 12:52 PM**

Compound	%Recovery
Freon 12	92
Freon 114	90
Chloromethane	81
Vinyl Chloride	82
1,3-Butadiene	76
Bromomethane	87
Chloroethane	83
Freon 11	95
Ethanol	76
Freon 113	90
1,1-Dichloroethene	83
Acetone	79
2-Propanol	78
Carbon Disulfide	78
3-Chloropropene	77
Methylene Chloride	94
Methyl tert-butyl ether	77
trans-1,2-Dichloroethene	83
Hexane	82
1,1-Dichloroethane	88
2-Butanone (Methyl Ethyl Ketone)	77
cis-1,2-Dichloroethene	82
Tetrahydrofuran	87
Chloroform	94
1,1,1-Trichloroethane	96
Cyclohexane	82
Carbon Tetrachloride	104
2,2,4-Trimethylpentane	96
Benzene	88
1,2-Dichloroethane	94
Heptane	82
Trichloroethene	90
1,2-Dichloropropane	94
1,4-Dioxane	84
Bromodichloromethane	96
cis-1,3-Dichloropropene	86
4-Methyl-2-pentanone	88
Toluene	95
trans-1,3-Dichloropropene	88
1,1,2-Trichloroethane	98
Tetrachloroethene	104
2-Hexanone	88

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 1907698AR1-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080205**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/2/19 12:52 PM**	

Compound	%Recovery
Dibromochloromethane	100
1,2-Dibromoethane (EDB)	97
Chlorobenzene	96
Ethyl Benzene	93
m,p-Xylene	94
o-Xylene	92
Styrene	87
Bromoform	106
Cumene	96
1,1,2,2-Tetrachloroethane	98
Propylbenzene	96
4-Ethyltoluene	97
1,3,5-Trimethylbenzene	103
1,2,4-Trimethylbenzene	95
1,3-Dichlorobenzene	107
1,4-Dichlorobenzene	106
alpha-Chlorotoluene	98
1,2-Dichlorobenzene	107
1,2,4-Trichlorobenzene	96
Hexachlorobutadiene	104
Butane	68
Isopentane	78

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	101	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 1907698AR1-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080203**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/2/19 11:07 AM**	

Compound	%Recovery	Method Limits
Freon 12	94	70-130
Freon 114	90	70-130
Chloromethane	87	70-130
Vinyl Chloride	85	70-130
1,3-Butadiene	77	70-130
Bromomethane	88	70-130
Chloroethane	84	70-130
Freon 11	99	70-130
Ethanol	80	70-130
Freon 113	93	70-130
1,1-Dichloroethene	76	70-130
Acetone	76	70-130
2-Propanol	78	70-130
Carbon Disulfide	78	70-130
3-Chloropropene	73	70-130
Methylene Chloride	95	70-130
Methyl tert-butyl ether	77	70-130
trans-1,2-Dichloroethene	85	70-130
Hexane	84	70-130
1,1-Dichloroethane	88	70-130
2-Butanone (Methyl Ethyl Ketone)	82	70-130
cis-1,2-Dichloroethene	82	70-130
Tetrahydrofuran	89	70-130
Chloroform	95	70-130
1,1,1-Trichloroethane	101	70-130
Cyclohexane	84	70-130
Carbon Tetrachloride	109	70-130
2,2,4-Trimethylpentane	100	70-130
Benzene	91	70-130
1,2-Dichloroethane	95	70-130
Heptane	87	70-130
Trichloroethene	94	70-130
1,2-Dichloropropane	98	70-130
1,4-Dioxane	96	70-130
Bromodichloromethane	101	70-130
cis-1,3-Dichloropropene	90	70-130
4-Methyl-2-pentanone	97	70-130
Toluene	100	70-130
trans-1,3-Dichloropropene	92	70-130
1,1,2-Trichloroethane	101	70-130
Tetrachloroethene	110	70-130
2-Hexanone	98	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 1907698AR1-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080203**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/2/19 11:07 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	108	70-130
1,2-Dibromoethane (EDB)	100	70-130
Chlorobenzene	102	70-130
Ethyl Benzene	100	70-130
m,p-Xylene	99	70-130
o-Xylene	99	70-130
Styrene	100	70-130
Bromoform	114	70-130
Cumene	101	70-130
1,1,2,2-Tetrachloroethane	106	70-130
Propylbenzene	102	70-130
4-Ethyltoluene	105	70-130
1,3,5-Trimethylbenzene	110	70-130
1,2,4-Trimethylbenzene	103	70-130
1,3-Dichlorobenzene	114	70-130
1,4-Dichlorobenzene	118	70-130
alpha-Chlorotoluene	112	70-130
1,2-Dichlorobenzene	116	70-130
1,2,4-Trichlorobenzene	107	70-130
Hexachlorobutadiene	112	70-130
Butane	71	60-140
Isopentane	80	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	100	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1907698AR1-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080204**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/2/19 11:52 AM**	

Compound	%Recovery	Method Limits
Freon 12	94	70-130
Freon 114	90	70-130
Chloromethane	86	70-130
Vinyl Chloride	86	70-130
1,3-Butadiene	76	70-130
Bromomethane	89	70-130
Chloroethane	85	70-130
Freon 11	98	70-130
Ethanol	80	70-130
Freon 113	91	70-130
1,1-Dichloroethene	76	70-130
Acetone	78	70-130
2-Propanol	76	70-130
Carbon Disulfide	76	70-130
3-Chloropropene	72	70-130
Methylene Chloride	91	70-130
Methyl tert-butyl ether	78	70-130
trans-1,2-Dichloroethene	82	70-130
Hexane	86	70-130
1,1-Dichloroethane	87	70-130
2-Butanone (Methyl Ethyl Ketone)	80	70-130
cis-1,2-Dichloroethene	80	70-130
Tetrahydrofuran	88	70-130
Chloroform	92	70-130
1,1,1-Trichloroethane	101	70-130
Cyclohexane	84	70-130
Carbon Tetrachloride	107	70-130
2,2,4-Trimethylpentane	100	70-130
Benzene	89	70-130
1,2-Dichloroethane	96	70-130
Heptane	89	70-130
Trichloroethene	92	70-130
1,2-Dichloropropane	97	70-130
1,4-Dioxane	93	70-130
Bromodichloromethane	100	70-130
cis-1,3-Dichloropropene	89	70-130
4-Methyl-2-pentanone	97	70-130
Toluene	98	70-130
trans-1,3-Dichloropropene	90	70-130
1,1,2-Trichloroethane	101	70-130
Tetrachloroethene	108	70-130
2-Hexanone	98	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1907698AR1-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j080204**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/2/19 11:52 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	107	70-130
1,2-Dibromoethane (EDB)	98	70-130
Chlorobenzene	101	70-130
Ethyl Benzene	97	70-130
m,p-Xylene	97	70-130
o-Xylene	99	70-130
Styrene	98	70-130
Bromoform	114	70-130
Cumene	100	70-130
1,1,2,2-Tetrachloroethane	103	70-130
Propylbenzene	101	70-130
4-Ethyltoluene	102	70-130
1,3,5-Trimethylbenzene	109	70-130
1,2,4-Trimethylbenzene	101	70-130
1,3-Dichlorobenzene	114	70-130
1,4-Dichlorobenzene	119	70-130
alpha-Chlorotoluene	111	70-130
1,2-Dichlorobenzene	114	70-130
1,2,4-Trichlorobenzene	109	70-130
Hexachlorobutadiene	112	70-130
Butane	67	60-140
Isopentane	79	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	100	70-130

eurofins | Air Toxics

8/13/2019
Ms. Elizabeth Kunkel
AECOM
100 N. Broadway, 20th Floor

St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60592794-1.04.003
Workorder #: 1907698B

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 7/31/2019 at Air Toxics Ltd.

The data and associated QC analyzed by Modified ASTM D-1946 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: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1907698B

Work Order Summary

CLIENT:	Ms. Elizabeth Kunkel AECOM 100 N. Broadway, 20th Floor St. Louis, MO 63102	**BILL TO:**	Accounts Payable Austin AECOM PO Box 203970 Austin, TX 78720
PHONE:	314-802-1171	**P.O. #**	110116ACM
FAX:		**PROJECT #**	60592794-1.04.003 Roxana Quarterly Soil Vapor
DATE RECEIVED:	07/31/2019	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	08/13/2019		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-073019	Modified ASTM D-1946	5.5 "Hg	15 psi
02A	VMP-15-5-073019-DUP	Modified ASTM D-1946	5.0 "Hg	15 psi
03A	VMP-15-21.5-073019	Modified ASTM D-1946	7.5 "Hg	15 psi
04A	VMP-55-20-073019	Modified ASTM D-1946	5.5 "Hg	15 psi
05A	Lab Blank	Modified ASTM D-1946	NA	NA
05B	Lab Blank	Modified ASTM D-1946	NA	NA
06A	LCS	Modified ASTM D-1946	NA	NA
06AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 08/13/19

Technical Director

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

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

LABORATORY NARRATIVE
Modified ASTM D-1946
AECOM
Workorder# 1907698B

Four 1 Liter Summa Canister samples were received on July 31, 2019. The laboratory performed analysis via Modified ASTM Method D-1946 for Methane and fixed gases in air using GC/FID or GC/TCD. The method involves direct injection of 1.0 mL of sample.

On the analytical column employed for this analysis, Oxygen coelutes with Argon. The corresponding peak is quantitated as Oxygen.

Since Nitrogen is used to pressurize samples, the reported Nitrogen values are calculated by adding all the sample components and subtracting from 100%.

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

Requirement	***ASTM D-1946***	***ATL Modifications***
Calibration	A single point calibration is performed using a reference standard closely matching the composition of the unknown.	A minimum of 5-point calibration curve is performed. Quantitation is based on average Response Factor.
Reference Standard	The composition of any reference standard must be known to within 0.01 mol % for any component.	The standards used by ATL are blended to a >/= 95% accuracy.
Sample Injection Volume	Components whose concentrations are in excess of 5 % should not be analyzed by using sample volumes greater than 0.5 mL.	The sample container is connected directly to a fixed volume sample loop of 1.0 mL on the GC. Linear range is defined by the calibration curve. Bags are loaded by vacuum.
Normalization	Normalize the mole percent values by multiplying each value by 100 and dividing by the sum of the original values. The sum of the original values should not differ from 100% by more than 1.0%.	Results are not normalized. The sum of the reported values can differ from 100% by as much as 15%, either due to analytical variability or an unusual sample matrix.
Precision	Precision requirements established at each concentration level.	Duplicates should agree within 25% RPD for detections > 5 X's the RL.

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.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
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 detection limit.
M - Reported value may be biased due to apparent matrix interferences.
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

eurofins | Air Toxics

Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: VMP-15-5-073019

Lab ID#: 1907698B-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	12
Nitrogen	0.25	83
Carbon Dioxide	0.025	5.0
Helium	0.12	0.016 J

Client Sample ID: VMP-15-5-073019-DUP

Lab ID#: 1907698B-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	12
Nitrogen	0.24	83
Carbon Dioxide	0.024	4.9
Helium	0.12	0.031 J

Client Sample ID: VMP-15-21.5-073019

Lab ID#: 1907698B-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	1.3
Nitrogen	0.27	82
Methane	0.00027	7.3
Carbon Dioxide	0.027	9.3
Ethane	0.0027	0.00054 J
Helium	0.13	0.0080 J

Client Sample ID: VMP-55-20-073019

Lab ID#: 1907698B-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	5.3
Nitrogen	0.25	76
Methane	0.00025	0.33

eurofins | Air Toxics

Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: VMP-55-20-073019

Lab ID#: 1907698B-04A

Carbon Dioxide	0.025	15
Ethane	0.0025	0.00013 J
Helium	0.12	2.9

eurofins | Air Toxics

Client Sample ID: VMP-15-5-073019

Lab ID#: 1907698B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080520**	**Date of Collection: 7/30/19 8:38:00 AM**	
Dil. Factor:	**2.47**	**Date of Analysis: 8/5/19 05:35 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	12
Nitrogen	0.25	83
Carbon Monoxide	0.025	Not Detected
Methane	0.00025	Not Detected
Carbon Dioxide	0.025	5.0
Ethane	0.0025	Not Detected
Ethene	0.0025	Not Detected
Helium	0.12	0.016 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

eurofins | Air Toxics

Client Sample ID: VMP-15-5-073019-DUP

Lab ID#: 1907698B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080521**	**Date of Collection: 7/30/19 8:38:00 AM**	
Dil. Factor:	**2.42**	**Date of Analysis: 8/5/19 06:04 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	12
Nitrogen	0.24	83
Carbon Monoxide	0.024	Not Detected
Methane	0.00024	Not Detected
Carbon Dioxide	0.024	4.9
Ethane	0.0024	Not Detected
Ethene	0.0024	Not Detected
Helium	0.12	0.031 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

eurofins | Air Toxics

Client Sample ID: VMP-15-21.5-073019

Lab ID#: 1907698B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080522**	**Date of Collection: 7/30/19 8:54:00 AM**	
Dil. Factor:	**2.69**	**Date of Analysis: 8/5/19 06:27 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	1.3
Nitrogen	0.27	82
Carbon Monoxide	0.027	Not Detected
Methane	0.00027	7.3
Carbon Dioxide	0.027	9.3
Ethane	0.0027	0.00054 J
Ethene	0.0027	Not Detected
Helium	0.13	0.0080 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

eurofins | Air Toxics

Client Sample ID: VMP-55-20-073019

Lab ID#: 1907698B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080523**	**Date of Collection: 7/30/19 9:39:00 AM**	
Dil. Factor:	**2.47**	**Date of Analysis: 8/5/19 06:49 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	5.3
Nitrogen	0.25	76
Carbon Monoxide	0.025	Not Detected
Methane	0.00025	0.33
Carbon Dioxide	0.025	15
Ethane	0.0025	0.00013 J
Ethene	0.0025	Not Detected
Helium	0.12	2.9

J = Estimated value.

Container Type: 1 Liter Summa Canister

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1907698B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080505**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/5/19 10:05 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	Not Detected
Nitrogen	0.10	Not Detected
Carbon Monoxide	0.010	Not Detected
Methane	0.00010	Not Detected
Carbon Dioxide	0.010	Not Detected
Ethane	0.0010	Not Detected
Ethene	0.0010	Not Detected

Container Type: NA - Not Applicable

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1907698B-05B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080506c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/5/19 10:30 AM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Helium	0.050	Not Detected

Container Type: NA - Not Applicable

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 1907698B-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080502**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/5/19 08:39 AM**	

Compound	%Recovery	Method Limits
Oxygen	102	85-115
Nitrogen	99	85-115
Carbon Monoxide	87	85-115
Methane	99	85-115
Carbon Dioxide	98	85-115
Ethane	99	85-115
Ethene	97	85-115
Helium	99	85-115

Container Type: NA - Not Applicable

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1907698B-06AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080503**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/5/19 09:01 AM**	

Compound	%Recovery	Method Limits
Oxygen	103	85-115
Nitrogen	99	85-115
Carbon Monoxide	88	85-115
Methane	100	85-115
Carbon Dioxide	98	85-115
Ethane	100	85-115
Ethene	99	85-115
Helium	93	85-115

Container Type: NA - Not Applicable