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November 9, 2018

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).

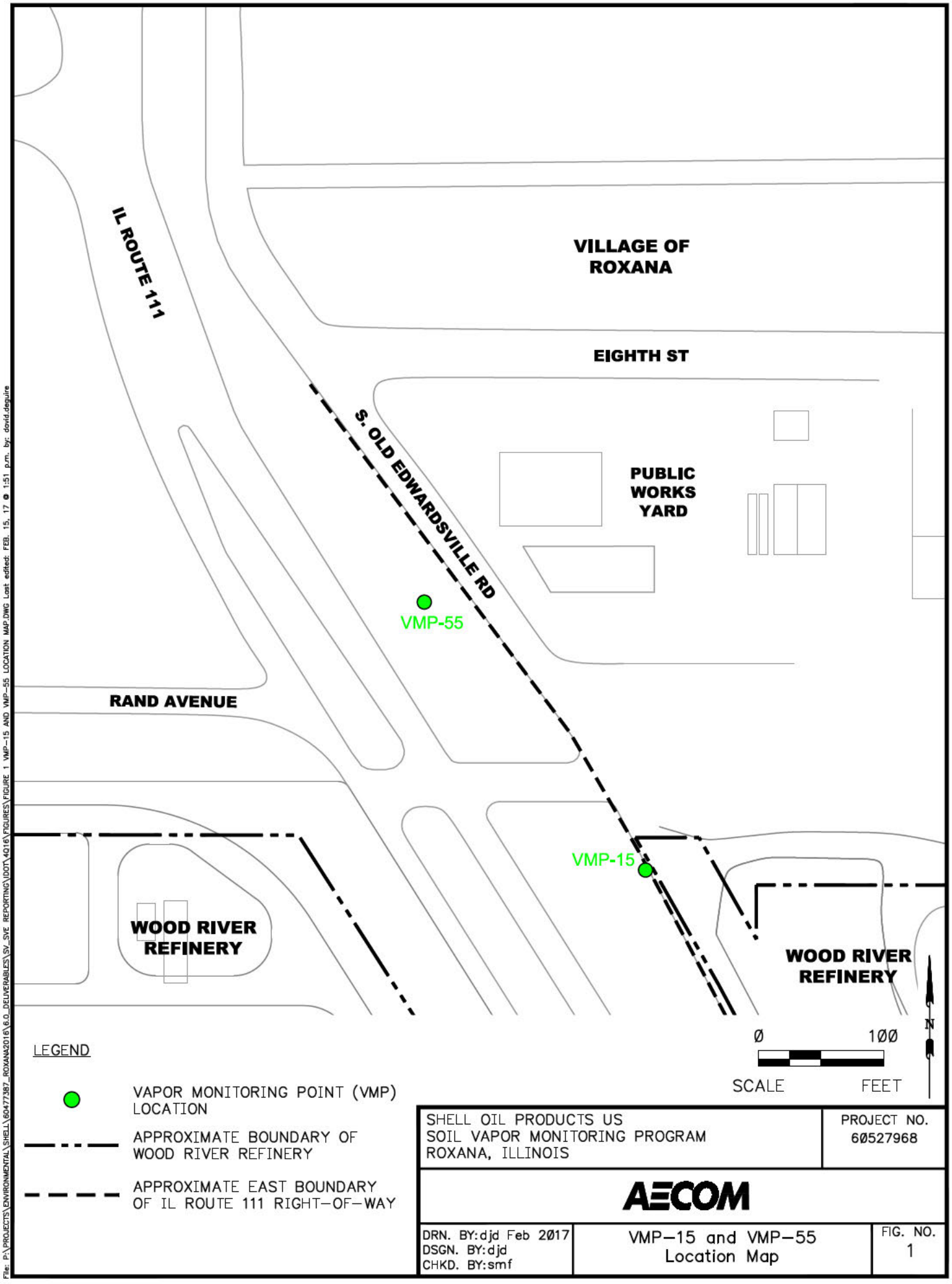
Sincerely,
AECOM, on behalf of Shell Oil Products US

Samuel Fisher
Environmental Scientist

Robert E. Mooshegian, STS
Senior Program Manager

Attachments

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



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

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8/8/2018

Ms. Elizabeth Kunkel
AECOM
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana Quarterly Soil Vapor
Project #: 60527968-01.04.003
Workorder #: 1807449A

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 7/26/2018 at Air Toxics Ltd.

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

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

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1807449A

Work Order Summary

CLIENT:	Ms. Elizabeth Kunkel AECOM 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin AECOM PO Box 203970 Austin, TX 78720
PHONE:	314-743-4179	**P.O. #**	60527968-0104003
FAX:		**PROJECT #**	60527968-01.04.003 Roxana Quarterly Soil Vapor
DATE RECEIVED:	07/26/2018	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	08/08/2018		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-072518	TO-15	5.1 "Hg	15.8 psi
02A	VMP-15-21.5-072518	TO-15	4.9 "Hg	14.7 psi
03A	VMP-15-25.5-072518	TO-15	5.1 "Hg	15.7 psi
03B	VMP-15-25.5-072518	TO-15	5.1 "Hg	15.7 psi
04A	VMP-15-29-072518	TO-15	6.3 "Hg	15.3 psi
05A	VMP-55-20-072518	TO-15	5.7 "Hg	15 psi
06A	Lab Blank	TO-15	NA	NA
06B	Lab Blank	TO-15	NA	NA
07A	CCV	TO-15	NA	NA
07B	CCV	TO-15	NA	NA
08A	LCS	TO-15	NA	NA
08AA	LCSD	TO-15	NA	NA
08B	LCS	TO-15	NA	NA
08BB	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 08/08/18

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-16-11, UT NELAP CA0093332016-7, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2016, Expiration date: 10/17/2017.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
EPA Method TO-15
AECOM
Workorder# 1807449A

Five 1 Liter Summa Canister samples were received on July 26, 2018. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

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

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

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

Due to high-level target compounds, sample VMP-15-25.5-072518 was 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.

Dilution was performed on sample VMP-55-20-072518 due to the presence of high level target species.

High concentrations of VOCs in sample VMP-55-20-072518 required an off-line dilution using a Tedlar bag. Toluene is a common contaminant in Tedlar bags, and a CN-flag was applied to the Toluene concentration to indicate a high bias.

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

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

Client Sample ID: VMP-15-5-072518

Lab ID#: 1807449A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.51 J	6.2	2.5 J
Acetone	12	14	30	33
Hexane	1.2	11	4.4	40
2-Butanone (Methyl Ethyl Ketone)	5.0	2.2 J	15	6.5 J
cis-1,2-Dichloroethene	1.2	3.0	5.0	12
Cyclohexane	1.2	2.6	4.3	8.8
2,2,4-Trimethylpentane	1.2	0.25 J	5.8	1.2 J
Benzene	1.2	1.3	4.0	4.2
Heptane	1.2	2.2	5.1	8.9
Trichloroethene	1.2	0.60 J	6.7	3.2 J
Toluene	1.2	0.44 J	4.7	1.6 J
Tetrachloroethene	1.2	16	8.5	100
Butane	5.0	8.4	12	20
Isopentane	5.0	22	15	67

Client Sample ID: VMP-15-21.5-072518

Lab ID#: 1807449A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.39 J	5.9	2.0 J
Acetone	12	14	28	34
Hexane	1.2	0.83 J	4.2	2.9 J
2-Butanone (Methyl Ethyl Ketone)	4.8	1.4 J	14	4.3 J
2,2,4-Trimethylpentane	1.2	120	5.6	550
Benzene	1.2	0.95 J	3.8	3.0 J
Toluene	1.2	0.34 J	4.5	1.3 J
Propylbenzene	1.2	0.23 J	5.9	1.1 J
Butane	4.8	3.2 J	11	7.5 J
Isopentane	4.8	1.6 J	14	4.8 J

Client Sample ID: VMP-15-25.5-072518

Lab ID#: 1807449A-03A

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

Client Sample ID: VMP-15-25.5-072518

Lab ID#: 1807449A-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	17	20	41	48
2-Butanone (Methyl Ethyl Ketone)	6.9	1.7 J	20	4.9 J
2,2,4-Trimethylpentane	1.7	560	8.0	2600
Benzene	1.7	10	5.5	32
Butane	6.9	52	16	120
Isopentane	6.9	3.0 J	20	8.9 J

Client Sample ID: VMP-15-25.5-072518

Lab ID#: 1807449A-03B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.33 J	6.2	1.6 J
Acetone	12	18	30	44
2-Butanone (Methyl Ethyl Ketone)	5.0	1.1 J	15	3.3 J
2,2,4-Trimethylpentane	1.2	520 E	5.8	2400 E
Benzene	1.2	8.5	4.0	27
Toluene	1.2	0.21 J	4.7	0.80 J
Butane	5.0	35	12	84
Isopentane	5.0	2.7 J	15	7.8 J

Client Sample ID: VMP-15-29-072518

Lab ID#: 1807449A-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	13	14	31	32
2-Butanone (Methyl Ethyl Ketone)	5.2	0.94 J	15	2.8 J
2,2,4-Trimethylpentane	1.3	400	6.0	1800
Benzene	1.3	8.4	4.1	27
Butane	5.2	31	12	73
Isopentane	5.2	4.5 J	15	13 J

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

Client Sample ID: VMP-55-20-072518

Lab ID#: 1807449A-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	310	420	590	790
Acetone	780	630 J	1800	1500 J
2-Propanol	310	270 J	770	670 J
Methylene Chloride	780	100 J	2700	350 J
Hexane	78	62 J	270	220 J
2-Butanone (Methyl Ethyl Ketone)	310	110 J	920	330 J
Cyclohexane	78	1100	270	3700
2,2,4-Trimethylpentane	78	21000	360	97000
Toluene	78	630 CN	290	2400 CN
Ethyl Benzene	78	74 J	340	320 J
m,p-Xylene	78	140	340	590
o-Xylene	78	45 J	340	200 J
Styrene	78	41 J	330	170 J
Butane	310	2200	740	5300
Isopentane	310	21000	920	61000

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Client Sample ID: VMP-15-5-072518

Lab ID#: 1807449A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073106**	**Date of Collection:**	**7/25/18 9:17:00 AM**
Dil. Factor:	**2.50**	**Date of Analysis:**	**7/31/18 02:06 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.51 J	6.2	2.5 J
Freon 114	1.2	Not Detected	8.7	Not Detected
Chloromethane	12	Not Detected	26	Not Detected
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
1,3-Butadiene	1.2	Not Detected	2.8	Not Detected
Bromomethane	12	Not Detected	48	Not Detected
Chloroethane	5.0	Not Detected	13	Not Detected
Freon 11	1.2	Not Detected	7.0	Not Detected
Ethanol	5.0	Not Detected	9.4	Not Detected
Freon 113	1.2	Not Detected	9.6	Not Detected
1,1-Dichloroethene	1.2	Not Detected	5.0	Not Detected
Acetone	12	14	30	33
2-Propanol	5.0	Not Detected	12	Not Detected
Carbon Disulfide	5.0	Not Detected	16	Not Detected
3-Chloropropene	5.0	Not Detected	16	Not Detected
Methylene Chloride	12	Not Detected	43	Not Detected
Methyl tert-butyl ether	5.0	Not Detected	18	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	5.0	Not Detected
Hexane	1.2	11	4.4	40
1,1-Dichloroethane	1.2	Not Detected	5.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.0	2.2 J	15	6.5 J
cis-1,2-Dichloroethene	1.2	3.0	5.0	12
Tetrahydrofuran	1.2	Not Detected	3.7	Not Detected
Chloroform	1.2	Not Detected	6.1	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.8	Not Detected
Cyclohexane	1.2	2.6	4.3	8.8
Carbon Tetrachloride	1.2	Not Detected	7.9	Not Detected
2,2,4-Trimethylpentane	1.2	0.25 J	5.8	1.2 J
Benzene	1.2	1.3	4.0	4.2
1,2-Dichloroethane	1.2	Not Detected	5.0	Not Detected
Heptane	1.2	2.2	5.1	8.9
Trichloroethene	1.2	0.60 J	6.7	3.2 J
1,2-Dichloropropane	1.2	Not Detected	5.8	Not Detected
1,4-Dioxane	5.0	Not Detected	18	Not Detected
Bromodichloromethane	1.2	Not Detected	8.4	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.7	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	5.1	Not Detected
Toluene	1.2	0.44 J	4.7	1.6 J
trans-1,3-Dichloropropene	1.2	Not Detected	5.7	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.8	Not Detected
Tetrachloroethene	1.2	16	8.5	100
2-Hexanone	5.0	Not Detected	20	Not Detected

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Client Sample ID: VMP-15-5-072518

Lab ID#: 1807449A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073106**	**Date of Collection:**	**7/25/18 9:17:00 AM**
Dil. Factor:	**2.50**	**Date of Analysis:**	**7/31/18 02:06 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.6	Not Detected
Chlorobenzene	1.2	Not Detected	5.8	Not Detected
Ethyl Benzene	1.2	Not Detected	5.4	Not Detected
m,p-Xylene	1.2	Not Detected	5.4	Not Detected
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	Not Detected	8.6	Not Detected
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	7.5	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.5	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
1,2,4-Trichlorobenzene	5.0	Not Detected	37	Not Detected
Hexachlorobutadiene	5.0	Not Detected	53	Not Detected
Butane	5.0	8.4	12	20
Isopentane	5.0	22	15	67

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: VMP-15-21.5-072518

Lab ID#: 1807449A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073107**	**Date of Collection:**	**7/25/18 9:31:00 AM**
Dil. Factor:	**2.39**	**Date of Analysis:**	**7/31/18 02:35 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.39 J	5.9	2.0 J
Freon 114	1.2	Not Detected	8.4	Not Detected
Chloromethane	12	Not Detected	25	Not Detected
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,3-Butadiene	1.2	Not Detected	2.6	Not Detected
Bromomethane	12	Not Detected	46	Not Detected
Chloroethane	4.8	Not Detected	13	Not Detected
Freon 11	1.2	Not Detected	6.7	Not Detected
Ethanol	4.8	Not Detected	9.0	Not Detected
Freon 113	1.2	Not Detected	9.2	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Acetone	12	14	28	34
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	4.7	Not Detected
Hexane	1.2	0.83 J	4.2	2.9 J
1,1-Dichloroethane	1.2	Not Detected	4.8	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.8	1.4 J	14	4.3 J
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.5	Not Detected
Chloroform	1.2	Not Detected	5.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
Cyclohexane	1.2	Not Detected	4.1	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.5	Not Detected
2,2,4-Trimethylpentane	1.2	120	5.6	550
Benzene	1.2	0.95 J	3.8	3.0 J
1,2-Dichloroethane	1.2	Not Detected	4.8	Not Detected
Heptane	1.2	Not Detected	4.9	Not Detected
Trichloroethene	1.2	Not Detected	6.4	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.5	Not Detected
1,4-Dioxane	4.8	Not Detected	17	Not Detected
Bromodichloromethane	1.2	Not Detected	8.0	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.4	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	4.9	Not Detected
Toluene	1.2	0.34 J	4.5	1.3 J
trans-1,3-Dichloropropene	1.2	Not Detected	5.4	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.5	Not Detected
Tetrachloroethene	1.2	Not Detected	8.1	Not Detected
2-Hexanone	4.8	Not Detected	20	Not Detected

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Client Sample ID: VMP-15-21.5-072518

Lab ID#: 1807449A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073107**	**Date of Collection:**	**7/25/18 9:31:00 AM**
Dil. Factor:	**2.39**	**Date of Analysis:**	**7/31/18 02:35 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	9.2	Not Detected
Chlorobenzene	1.2	Not Detected	5.5	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	5.1	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	8.2	Not Detected
Propylbenzene	1.2	0.23 J	5.9	1.1 J
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	7.2	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.2	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.2	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.2	Not Detected
1,2,4-Trichlorobenzene	4.8	Not Detected	35	Not Detected
Hexachlorobutadiene	4.8	Not Detected	51	Not Detected
Butane	4.8	3.2 J	11	7.5 J
Isopentane	4.8	1.6 J	14	4.8 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: VMP-15-25.5-072518

Lab ID#: 1807449A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p080713**	**Date of Collection:**	**7/25/18 9:47:00 AM**
Dil. Factor:	**3.44**	**Date of Analysis:**	**8/7/18 05:24 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.7	Not Detected	8.5	Not Detected
Freon 114	1.7	Not Detected	12	Not Detected
Chloromethane	17	Not Detected	36	Not Detected
Vinyl Chloride	1.7	Not Detected	4.4	Not Detected
1,3-Butadiene	1.7	Not Detected	3.8	Not Detected
Bromomethane	17	Not Detected	67	Not Detected
Chloroethane	6.9	Not Detected	18	Not Detected
Freon 11	1.7	Not Detected	9.7	Not Detected
Ethanol	6.9	Not Detected	13	Not Detected
Freon 113	1.7	Not Detected	13	Not Detected
1,1-Dichloroethene	1.7	Not Detected	6.8	Not Detected
Acetone	17	20	41	48
2-Propanol	6.9	Not Detected	17	Not Detected
Carbon Disulfide	6.9	Not Detected	21	Not Detected
3-Chloropropene	6.9	Not Detected	22	Not Detected
Methylene Chloride	17	Not Detected	60	Not Detected
Methyl tert-butyl ether	6.9	Not Detected	25	Not Detected
trans-1,2-Dichloroethene	1.7	Not Detected	6.8	Not Detected
Hexane	1.7	Not Detected	6.1	Not Detected
1,1-Dichloroethane	1.7	Not Detected	7.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	6.9	1.7 J	20	4.9 J
cis-1,2-Dichloroethene	1.7	Not Detected	6.8	Not Detected
Tetrahydrofuran	1.7	Not Detected	5.1	Not Detected
Chloroform	1.7	Not Detected	8.4	Not Detected
1,1,1-Trichloroethane	1.7	Not Detected	9.4	Not Detected
Cyclohexane	1.7	Not Detected	5.9	Not Detected
Carbon Tetrachloride	1.7	Not Detected	11	Not Detected
2,2,4-Trimethylpentane	1.7	560	8.0	2600
Benzene	1.7	10	5.5	32
1,2-Dichloroethane	1.7	Not Detected	7.0	Not Detected
Heptane	1.7	Not Detected	7.0	Not Detected
Trichloroethene	1.7	Not Detected	9.2	Not Detected
1,2-Dichloropropane	1.7	Not Detected	7.9	Not Detected
1,4-Dioxane	6.9	Not Detected	25	Not Detected
Bromodichloromethane	1.7	Not Detected	12	Not Detected
cis-1,3-Dichloropropene	1.7	Not Detected	7.8	Not Detected
4-Methyl-2-pentanone	1.7	Not Detected	7.0	Not Detected
Toluene	1.7	Not Detected	6.5	Not Detected
trans-1,3-Dichloropropene	1.7	Not Detected	7.8	Not Detected
1,1,2-Trichloroethane	1.7	Not Detected	9.4	Not Detected
Tetrachloroethene	1.7	Not Detected	12	Not Detected
2-Hexanone	6.9	Not Detected	28	Not Detected

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Client Sample ID: VMP-15-25.5-072518

Lab ID#: 1807449A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p080713**	**Date of Collection:**	**7/25/18 9:47:00 AM**
Dil. Factor:	**3.44**	**Date of Analysis:**	**8/7/18 05:24 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.7	Not Detected	15	Not Detected
1,2-Dibromoethane (EDB)	1.7	Not Detected	13	Not Detected
Chlorobenzene	1.7	Not Detected	7.9	Not Detected
Ethyl Benzene	1.7	Not Detected	7.5	Not Detected
m,p-Xylene	1.7	Not Detected	7.5	Not Detected
o-Xylene	1.7	Not Detected	7.5	Not Detected
Styrene	1.7	Not Detected	7.3	Not Detected
Bromoform	1.7	Not Detected	18	Not Detected
Cumene	1.7	Not Detected	8.4	Not Detected
1,1,2,2-Tetrachloroethane	1.7	Not Detected	12	Not Detected
Propylbenzene	1.7	Not Detected	8.4	Not Detected
4-Ethyltoluene	1.7	Not Detected	8.4	Not Detected
1,3,5-Trimethylbenzene	1.7	Not Detected	8.4	Not Detected
1,2,4-Trimethylbenzene	1.7	Not Detected	8.4	Not Detected
1,3-Dichlorobenzene	1.7	Not Detected	10	Not Detected
1,4-Dichlorobenzene	1.7	Not Detected	10	Not Detected
alpha-Chlorotoluene	1.7	Not Detected	8.9	Not Detected
1,2-Dichlorobenzene	1.7	Not Detected	10	Not Detected
1,2,4-Trichlorobenzene	6.9	Not Detected	51	Not Detected
Hexachlorobutadiene	6.9	Not Detected	73	Not Detected
Butane	6.9	52	16	120
Isopentane	6.9	3.0 J	20	8.9 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	89	70-130

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Client Sample ID: VMP-15-25.5-072518

Lab ID#: 1807449A-03B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073108**	**Date of Collection:**	**7/25/18 9:47:00 AM**
Dil. Factor:	**2.49**	**Date of Analysis:**	**7/31/18 03:03 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.33 J	6.2	1.6 J
Freon 114	1.2	Not Detected	8.7	Not Detected
Chloromethane	12	Not Detected	26	Not Detected
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
1,3-Butadiene	1.2	Not Detected	2.8	Not Detected
Bromomethane	12	Not Detected	48	Not Detected
Chloroethane	5.0	Not Detected	13	Not Detected
Freon 11	1.2	Not Detected	7.0	Not Detected
Ethanol	5.0	Not Detected	9.4	Not Detected
Freon 113	1.2	Not Detected	9.5	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Acetone	12	18	30	44
2-Propanol	5.0	Not Detected	12	Not Detected
Carbon Disulfide	5.0	Not Detected	16	Not Detected
3-Chloropropene	5.0	Not Detected	16	Not Detected
Methylene Chloride	12	Not Detected	43	Not Detected
Methyl tert-butyl ether	5.0	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	Not Detected	5.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.0	1.1 J	15	3.3 J
cis-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.7	Not Detected
Chloroform	1.2	Not Detected	6.1	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.8	Not Detected
Cyclohexane	1.2	Not Detected	4.3	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.8	Not Detected
2,2,4-Trimethylpentane	1.2	520 E	5.8	2400 E
Benzene	1.2	8.5	4.0	27
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	6.7	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.8	Not Detected
1,4-Dioxane	5.0	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	5.1	Not Detected
Toluene	1.2	0.21 J	4.7	0.80 J
trans-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.8	Not Detected
Tetrachloroethene	1.2	Not Detected	8.4	Not Detected
2-Hexanone	5.0	Not Detected	20	Not Detected

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Client Sample ID: VMP-15-25.5-072518

Lab ID#: 1807449A-03B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073108**	**Date of Collection:**	**7/25/18 9:47:00 AM**
Dil. Factor:	**2.49**	**Date of Analysis:**	**7/31/18 03:03 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.6	Not Detected
Chlorobenzene	1.2	Not Detected	5.7	Not Detected
Ethyl Benzene	1.2	Not Detected	5.4	Not Detected
m,p-Xylene	1.2	Not Detected	5.4	Not Detected
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	Not Detected	8.5	Not Detected
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	7.5	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.4	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.5	Not Detected
1,2,4-Trichlorobenzene	5.0	Not Detected	37	Not Detected
Hexachlorobutadiene	5.0	Not Detected	53	Not Detected
Butane	5.0	35	12	84
Isopentane	5.0	2.7 J	15	7.8 J

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

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: VMP-15-29-072518

Lab ID#: 1807449A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073109**	**Date of Collection:**	**7/25/18 10:04:00 AM**
Dil. Factor:	**2.58**	**Date of Analysis:**	**7/31/18 03:32 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	Not Detected	6.4	Not Detected
Freon 114	1.3	Not Detected	9.0	Not Detected
Chloromethane	13	Not Detected	27	Not Detected
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
1,3-Butadiene	1.3	Not Detected	2.8	Not Detected
Bromomethane	13	Not Detected	50	Not Detected
Chloroethane	5.2	Not Detected	14	Not Detected
Freon 11	1.3	Not Detected	7.2	Not Detected
Ethanol	5.2	Not Detected	9.7	Not Detected
Freon 113	1.3	Not Detected	9.9	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Acetone	13	14	31	32
2-Propanol	5.2	Not Detected	13	Not Detected
Carbon Disulfide	5.2	Not Detected	16	Not Detected
3-Chloropropene	5.2	Not Detected	16	Not Detected
Methylene Chloride	13	Not Detected	45	Not Detected
Methyl tert-butyl ether	5.2	Not Detected	19	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Hexane	1.3	Not Detected	4.5	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.2	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.2	0.94 J	15	2.8 J
cis-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.8	Not Detected
Chloroform	1.3	Not Detected	6.3	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Cyclohexane	1.3	Not Detected	4.4	Not Detected
Carbon Tetrachloride	1.3	Not Detected	8.1	Not Detected
2,2,4-Trimethylpentane	1.3	400	6.0	1800
Benzene	1.3	8.4	4.1	27
1,2-Dichloroethane	1.3	Not Detected	5.2	Not Detected
Heptane	1.3	Not Detected	5.3	Not Detected
Trichloroethene	1.3	Not Detected	6.9	Not Detected
1,2-Dichloropropane	1.3	Not Detected	6.0	Not Detected
1,4-Dioxane	5.2	Not Detected	18	Not Detected
Bromodichloromethane	1.3	Not Detected	8.6	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected
4-Methyl-2-pentanone	1.3	Not Detected	5.3	Not Detected
Toluene	1.3	Not Detected	4.9	Not Detected
trans-1,3-Dichloropropene	1.3	Not Detected	5.8	Not Detected
1,1,2-Trichloroethane	1.3	Not Detected	7.0	Not Detected
Tetrachloroethene	1.3	Not Detected	8.8	Not Detected
2-Hexanone	5.2	Not Detected	21	Not Detected

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Client Sample ID: VMP-15-29-072518

Lab ID#: 1807449A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073109**	**Date of Collection:**	**7/25/18 10:04:00 AM**
Dil. Factor:	**2.58**	**Date of Analysis:**	**7/31/18 03:32 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	9.9	Not Detected
Chlorobenzene	1.3	Not Detected	5.9	Not Detected
Ethyl Benzene	1.3	Not Detected	5.6	Not Detected
m,p-Xylene	1.3	Not Detected	5.6	Not Detected
o-Xylene	1.3	Not Detected	5.6	Not Detected
Styrene	1.3	Not Detected	5.5	Not Detected
Bromoform	1.3	Not Detected	13	Not Detected
Cumene	1.3	Not Detected	6.3	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	8.8	Not Detected
Propylbenzene	1.3	Not Detected	6.3	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.3	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.3	Not Detected
1,2,4-Trimethylbenzene	1.3	Not Detected	6.3	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.7	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.8	Not Detected
1,2,4-Trichlorobenzene	5.2	Not Detected	38	Not Detected
Hexachlorobutadiene	5.2	Not Detected	55	Not Detected
Butane	5.2	31	12	73
Isopentane	5.2	4.5 J	15	13 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: VMP-55-20-072518

Lab ID#: 1807449A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073110**	**Date of Collection:**	**7/25/18 11:21:00 AM**
Dil. Factor:	**156**	**Date of Analysis:**	**7/31/18 03:59 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	78	Not Detected	380	Not Detected
Freon 114	78	Not Detected	540	Not Detected
Chloromethane	780	Not Detected	1600	Not Detected
Vinyl Chloride	78	Not Detected	200	Not Detected
1,3-Butadiene	78	Not Detected	170	Not Detected
Bromomethane	780	Not Detected	3000	Not Detected
Chloroethane	310	Not Detected	820	Not Detected
Freon 11	78	Not Detected	440	Not Detected
Ethanol	310	420	590	790
Freon 113	78	Not Detected	600	Not Detected
1,1-Dichloroethene	78	Not Detected	310	Not Detected
Acetone	780	630 J	1800	1500 J
2-Propanol	310	270 J	770	670 J
Carbon Disulfide	310	Not Detected	970	Not Detected
3-Chloropropene	310	Not Detected	980	Not Detected
Methylene Chloride	780	100 J	2700	350 J
Methyl tert-butyl ether	310	Not Detected	1100	Not Detected
trans-1,2-Dichloroethene	78	Not Detected	310	Not Detected
Hexane	78	62 J	270	220 J
1,1-Dichloroethane	78	Not Detected	320	Not Detected
2-Butanone (Methyl Ethyl Ketone)	310	110 J	920	330 J
cis-1,2-Dichloroethene	78	Not Detected	310	Not Detected
Tetrahydrofuran	78	Not Detected	230	Not Detected
Chloroform	78	Not Detected	380	Not Detected
1,1,1-Trichloroethane	78	Not Detected	420	Not Detected
Cyclohexane	78	1100	270	3700
Carbon Tetrachloride	78	Not Detected	490	Not Detected
2,2,4-Trimethylpentane	78	21000	360	97000
Benzene	78	Not Detected	250	Not Detected
1,2-Dichloroethane	78	Not Detected	320	Not Detected
Heptane	78	Not Detected	320	Not Detected
Trichloroethene	78	Not Detected	420	Not Detected
1,2-Dichloropropane	78	Not Detected	360	Not Detected
1,4-Dioxane	310	Not Detected	1100	Not Detected
Bromodichloromethane	78	Not Detected	520	Not Detected
cis-1,3-Dichloropropene	78	Not Detected	350	Not Detected
4-Methyl-2-pentanone	78	Not Detected	320	Not Detected
Toluene	78	630 CN	290	2400 CN
trans-1,3-Dichloropropene	78	Not Detected	350	Not Detected
1,1,2-Trichloroethane	78	Not Detected	420	Not Detected
Tetrachloroethene	78	Not Detected	530	Not Detected
2-Hexanone	310	Not Detected	1300	Not Detected

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Client Sample ID: VMP-55-20-072518

Lab ID#: 1807449A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073110**	**Date of Collection:**	**7/25/18 11:21:00 AM**
Dil. Factor:	**156**	**Date of Analysis:**	**7/31/18 03:59 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	78	Not Detected	660	Not Detected
1,2-Dibromoethane (EDB)	78	Not Detected	600	Not Detected
Chlorobenzene	78	Not Detected	360	Not Detected
Ethyl Benzene	78	74 J	340	320 J
m,p-Xylene	78	140	340	590
o-Xylene	78	45 J	340	200 J
Styrene	78	41 J	330	170 J
Bromoform	78	Not Detected	810	Not Detected
Cumene	78	Not Detected	380	Not Detected
1,1,2,2-Tetrachloroethane	78	Not Detected	540	Not Detected
Propylbenzene	78	Not Detected	380	Not Detected
4-Ethyltoluene	78	Not Detected	380	Not Detected
1,3,5-Trimethylbenzene	78	Not Detected	380	Not Detected
1,2,4-Trimethylbenzene	78	Not Detected	380	Not Detected
1,3-Dichlorobenzene	78	Not Detected	470	Not Detected
1,4-Dichlorobenzene	78	Not Detected	470	Not Detected
alpha-Chlorotoluene	78	Not Detected	400	Not Detected
1,2-Dichlorobenzene	78	Not Detected	470	Not Detected
1,2,4-Trichlorobenzene	310	Not Detected	2300	Not Detected
Hexachlorobutadiene	310	Not Detected	3300	Not Detected
Butane	310	2200	740	5300
Isopentane	310	21000	920	61000

J = Estimated value.
CN =See Case Narrative explanation
Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1807449A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073105a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/18 11:33 AM**	

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	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 1807449A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073105a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/18 11:33 AM**	

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

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1807449A-06B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p080707a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/7/18 12:15 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	0.29 J	6.2	0.91 J
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	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 1807449A-06B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p080707a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/7/18 12:15 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	0.043 J	3.8	0.33 J
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	0.062 J	3.4	0.43 J
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	94	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	88	70-130

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Client Sample ID: CCV

Lab ID#: 1807449A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/18 09:56 AM**	

Compound	%Recovery
Freon 12	102
Freon 114	102
Chloromethane	94
Vinyl Chloride	89
1,3-Butadiene	93
Bromomethane	88
Chloroethane	90
Freon 11	95
Ethanol	85
Freon 113	97
1,1-Dichloroethene	94
Acetone	90
2-Propanol	83
Carbon Disulfide	92
3-Chloropropene	93
Methylene Chloride	86
Methyl tert-butyl ether	92
trans-1,2-Dichloroethene	94
Hexane	87
1,1-Dichloroethane	92
2-Butanone (Methyl Ethyl Ketone)	95
cis-1,2-Dichloroethene	96
Tetrahydrofuran	85
Chloroform	102
1,1,1-Trichloroethane	98
Cyclohexane	94
Carbon Tetrachloride	98
2,2,4-Trimethylpentane	95
Benzene	96
1,2-Dichloroethane	98
Heptane	96
Trichloroethene	102
1,2-Dichloropropane	93
1,4-Dioxane	92
Bromodichloromethane	100
cis-1,3-Dichloropropene	100
4-Methyl-2-pentanone	86
Toluene	98
trans-1,3-Dichloropropene	100
1,1,2-Trichloroethane	101
Tetrachloroethene	100
2-Hexanone	88

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Client Sample ID: CCV

Lab ID#: 1807449A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/18 09:56 AM**	

Compound	%Recovery
Dibromochloromethane	102
1,2-Dibromoethane (EDB)	100
Chlorobenzene	98
Ethyl Benzene	98
m,p-Xylene	96
o-Xylene	96
Styrene	92
Bromoform	98
Cumene	98
1,1,2,2-Tetrachloroethane	99
Propylbenzene	98
4-Ethyltoluene	100
1,3,5-Trimethylbenzene	98
1,2,4-Trimethylbenzene	99
1,3-Dichlorobenzene	99
1,4-Dichlorobenzene	99
alpha-Chlorotoluene	101
1,2-Dichlorobenzene	99
1,2,4-Trichlorobenzene	91
Hexachlorobutadiene	90
Butane	82
Isopentane	86

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: CCV

Lab ID#: 1807449A-07B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p080702**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/7/18 09:25 AM**	

Compound	%Recovery
Freon 12	109
Freon 114	112
Chloromethane	113
Vinyl Chloride	115
1,3-Butadiene	89
Bromomethane	110
Chloroethane	100
Freon 11	109
Ethanol	85
Freon 113	107
1,1-Dichloroethene	104
Acetone	104
2-Propanol	99
Carbon Disulfide	98
3-Chloropropene	99
Methylene Chloride	98
Methyl tert-butyl ether	108
trans-1,2-Dichloroethene	109
Hexane	104
1,1-Dichloroethane	104
2-Butanone (Methyl Ethyl Ketone)	107
cis-1,2-Dichloroethene	105
Tetrahydrofuran	106
Chloroform	105
1,1,1-Trichloroethane	104
Cyclohexane	108
Carbon Tetrachloride	117
2,2,4-Trimethylpentane	101
Benzene	111
1,2-Dichloroethane	105
Heptane	116
Trichloroethene	100
1,2-Dichloropropane	97
1,4-Dioxane	109
Bromodichloromethane	105
cis-1,3-Dichloropropene	101
4-Methyl-2-pentanone	103
Toluene	105
trans-1,3-Dichloropropene	112
1,1,2-Trichloroethane	105
Tetrachloroethene	110
2-Hexanone	116

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Client Sample ID: CCV

Lab ID#: 1807449A-07B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p080702**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/7/18 09:25 AM**	

Compound	%Recovery
Dibromochloromethane	112
1,2-Dibromoethane (EDB)	110
Chlorobenzene	106
Ethyl Benzene	117
m,p-Xylene	118
o-Xylene	116
Styrene	128
Bromoform	107
Cumene	119
1,1,2,2-Tetrachloroethane	97
Propylbenzene	113
4-Ethyltoluene	130
1,3,5-Trimethylbenzene	118
1,2,4-Trimethylbenzene	117
1,3-Dichlorobenzene	108
1,4-Dichlorobenzene	110
alpha-Chlorotoluene	112
1,2-Dichlorobenzene	106
1,2,4-Trichlorobenzene	88
Hexachlorobutadiene	89
Butane	92
Isopentane	96

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	107	70-130

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Client Sample ID: LCS

Lab ID#: 1807449A-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/18 10:23 AM**	

Compound	%Recovery	Method Limits
Freon 12	102	70-130
Freon 114	102	70-130
Chloromethane	96	70-130
Vinyl Chloride	92	70-130
1,3-Butadiene	91	70-130
Bromomethane	92	70-130
Chloroethane	94	70-130
Freon 11	96	70-130
Ethanol	86	70-130
Freon 113	96	70-130
1,1-Dichloroethene	94	70-130
Acetone	87	70-130
2-Propanol	85	70-130
Carbon Disulfide	94	70-130
3-Chloropropene	97	70-130
Methylene Chloride	85	70-130
Methyl tert-butyl ether	92	70-130
trans-1,2-Dichloroethene	102	70-130
Hexane	90	70-130
1,1-Dichloroethane	91	70-130
2-Butanone (Methyl Ethyl Ketone)	97	70-130
cis-1,2-Dichloroethene	88	70-130
Tetrahydrofuran	88	70-130
Chloroform	101	70-130
1,1,1-Trichloroethane	100	70-130
Cyclohexane	96	70-130
Carbon Tetrachloride	99	70-130
2,2,4-Trimethylpentane	97	70-130
Benzene	95	70-130
1,2-Dichloroethane	96	70-130
Heptane	97	70-130
Trichloroethene	107	70-130
1,2-Dichloropropane	93	70-130
1,4-Dioxane	98	70-130
Bromodichloromethane	103	70-130
cis-1,3-Dichloropropene	106	70-130
4-Methyl-2-pentanone	90	70-130
Toluene	98	70-130
trans-1,3-Dichloropropene	101	70-130
1,1,2-Trichloroethane	101	70-130
Tetrachloroethene	100	70-130
2-Hexanone	95	70-130

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Client Sample ID: LCS

Lab ID#: 1807449A-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/18 10:23 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	103	70-130
1,2-Dibromoethane (EDB)	100	70-130
Chlorobenzene	99	70-130
Ethyl Benzene	99	70-130
m,p-Xylene	97	70-130
o-Xylene	97	70-130
Styrene	96	70-130
Bromoform	104	70-130
Cumene	99	70-130
1,1,2,2-Tetrachloroethane	96	70-130
Propylbenzene	101	70-130
4-Ethyltoluene	104	70-130
1,3,5-Trimethylbenzene	100	70-130
1,2,4-Trimethylbenzene	102	70-130
1,3-Dichlorobenzene	100	70-130
1,4-Dichlorobenzene	100	70-130
alpha-Chlorotoluene	110	70-130
1,2-Dichlorobenzene	100	70-130
1,2,4-Trichlorobenzene	95	70-130
Hexachlorobutadiene	94	70-130
Butane	80	60-140
Isopentane	87	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCSD

Lab ID#: 1807449A-08AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/18 10:49 AM**	

Compound	%Recovery	Method Limits
Freon 12	104	70-130
Freon 114	105	70-130
Chloromethane	97	70-130
Vinyl Chloride	93	70-130
1,3-Butadiene	91	70-130
Bromomethane	94	70-130
Chloroethane	97	70-130
Freon 11	96	70-130
Ethanol	87	70-130
Freon 113	97	70-130
1,1-Dichloroethene	96	70-130
Acetone	88	70-130
2-Propanol	87	70-130
Carbon Disulfide	94	70-130
3-Chloropropene	96	70-130
Methylene Chloride	86	70-130
Methyl tert-butyl ether	94	70-130
trans-1,2-Dichloroethene	103	70-130
Hexane	90	70-130
1,1-Dichloroethane	92	70-130
2-Butanone (Methyl Ethyl Ketone)	100	70-130
cis-1,2-Dichloroethene	89	70-130
Tetrahydrofuran	90	70-130
Chloroform	103	70-130
1,1,1-Trichloroethane	100	70-130
Cyclohexane	96	70-130
Carbon Tetrachloride	100	70-130
2,2,4-Trimethylpentane	98	70-130
Benzene	96	70-130
1,2-Dichloroethane	95	70-130
Heptane	98	70-130
Trichloroethene	108	70-130
1,2-Dichloropropane	93	70-130
1,4-Dioxane	99	70-130
Bromodichloromethane	102	70-130
cis-1,3-Dichloropropene	106	70-130
4-Methyl-2-pentanone	92	70-130
Toluene	99	70-130
trans-1,3-Dichloropropene	100	70-130
1,1,2-Trichloroethane	101	70-130
Tetrachloroethene	99	70-130
2-Hexanone	94	70-130

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Client Sample ID: LCSD

Lab ID#: 1807449A-08AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17073104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/18 10:49 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	104	70-130
1,2-Dibromoethane (EDB)	100	70-130
Chlorobenzene	98	70-130
Ethyl Benzene	99	70-130
m,p-Xylene	98	70-130
o-Xylene	98	70-130
Styrene	95	70-130
Bromoform	104	70-130
Cumene	99	70-130
1,1,2,2-Tetrachloroethane	95	70-130
Propylbenzene	101	70-130
4-Ethyltoluene	104	70-130
1,3,5-Trimethylbenzene	100	70-130
1,2,4-Trimethylbenzene	101	70-130
1,3-Dichlorobenzene	100	70-130
1,4-Dichlorobenzene	102	70-130
alpha-Chlorotoluene	110	70-130
1,2-Dichlorobenzene	100	70-130
1,2,4-Trichlorobenzene	96	70-130
Hexachlorobutadiene	96	70-130
Butane	82	60-140
Isopentane	88	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: LCS

Lab ID#: 1807449A-08B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p080703**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/7/18 09:49 AM**	

Compound	%Recovery	Method Limits
Freon 12	109	70-130
Freon 114	111	70-130
Chloromethane	108	70-130
Vinyl Chloride	123	70-130
1,3-Butadiene	107	70-130
Bromomethane	112	70-130
Chloroethane	106	70-130
Freon 11	108	70-130
Ethanol	91	70-130
Freon 113	104	70-130
1,1-Dichloroethene	105	70-130
Acetone	108	70-130
2-Propanol	96	70-130
Carbon Disulfide	101	70-130
3-Chloropropene	103	70-130
Methylene Chloride	98	70-130
Methyl tert-butyl ether	100	70-130
trans-1,2-Dichloroethene	115	70-130
Hexane	107	70-130
1,1-Dichloroethane	99	70-130
2-Butanone (Methyl Ethyl Ketone)	102	70-130
cis-1,2-Dichloroethene	90	70-130
Tetrahydrofuran	106	70-130
Chloroform	105	70-130
1,1,1-Trichloroethane	105	70-130
Cyclohexane	109	70-130
Carbon Tetrachloride	112	70-130
2,2,4-Trimethylpentane	104	70-130
Benzene	110	70-130
1,2-Dichloroethane	102	70-130
Heptane	112	70-130
Trichloroethene	105	70-130
1,2-Dichloropropane	97	70-130
1,4-Dioxane	104	70-130
Bromodichloromethane	105	70-130
cis-1,3-Dichloropropene	108	70-130
4-Methyl-2-pentanone	98	70-130
Toluene	106	70-130
trans-1,3-Dichloropropene	109	70-130
1,1,2-Trichloroethane	106	70-130
Tetrachloroethene	107	70-130
2-Hexanone	95	70-130

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Client Sample ID: LCS

Lab ID#: 1807449A-08B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p080703**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/7/18 09:49 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	110	70-130
1,2-Dibromoethane (EDB)	108	70-130
Chlorobenzene	105	70-130
Ethyl Benzene	116	70-130
m,p-Xylene	118	70-130
o-Xylene	118	70-130
Styrene	119	70-130
Bromoform	109	70-130
Cumene	117	70-130
1,1,2,2-Tetrachloroethane	94	70-130
Propylbenzene	111	70-130
4-Ethyltoluene	125	70-130
1,3,5-Trimethylbenzene	115	70-130
1,2,4-Trimethylbenzene	115	70-130
1,3-Dichlorobenzene	110	70-130
1,4-Dichlorobenzene	112	70-130
alpha-Chlorotoluene	104	70-130
1,2-Dichlorobenzene	109	70-130
1,2,4-Trichlorobenzene	100	70-130
Hexachlorobutadiene	100	70-130
Butane	96	60-140
Isopentane	95	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	108	70-130

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Client Sample ID: LCSD

Lab ID#: 1807449A-08BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p080704**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/7/18 10:13 AM**	

Compound	%Recovery	Method Limits
Freon 12	109	70-130
Freon 114	112	70-130
Chloromethane	107	70-130
Vinyl Chloride	117	70-130
1,3-Butadiene	105	70-130
Bromomethane	116	70-130
Chloroethane	107	70-130
Freon 11	110	70-130
Ethanol	91	70-130
Freon 113	105	70-130
1,1-Dichloroethene	105	70-130
Acetone	111	70-130
2-Propanol	98	70-130
Carbon Disulfide	101	70-130
3-Chloropropene	107	70-130
Methylene Chloride	98	70-130
Methyl tert-butyl ether	102	70-130
trans-1,2-Dichloroethene	117	70-130
Hexane	108	70-130
1,1-Dichloroethane	100	70-130
2-Butanone (Methyl Ethyl Ketone)	105	70-130
cis-1,2-Dichloroethene	92	70-130
Tetrahydrofuran	105	70-130
Chloroform	104	70-130
1,1,1-Trichloroethane	104	70-130
Cyclohexane	110	70-130
Carbon Tetrachloride	112	70-130
2,2,4-Trimethylpentane	103	70-130
Benzene	108	70-130
1,2-Dichloroethane	100	70-130
Heptane	112	70-130
Trichloroethene	103	70-130
1,2-Dichloropropane	97	70-130
1,4-Dioxane	104	70-130
Bromodichloromethane	105	70-130
cis-1,3-Dichloropropene	109	70-130
4-Methyl-2-pentanone	97	70-130
Toluene	104	70-130
trans-1,3-Dichloropropene	107	70-130
1,1,2-Trichloroethane	104	70-130
Tetrachloroethene	105	70-130
2-Hexanone	92	70-130

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Client Sample ID: LCSD

Lab ID#: 1807449A-08BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p080704**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/7/18 10:13 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	107	70-130
1,2-Dibromoethane (EDB)	105	70-130
Chlorobenzene	102	70-130
Ethyl Benzene	114	70-130
m,p-Xylene	114	70-130
o-Xylene	114	70-130
Styrene	115	70-130
Bromoform	107	70-130
Cumene	115	70-130
1,1,2,2-Tetrachloroethane	92	70-130
Propylbenzene	108	70-130
4-Ethyltoluene	117	70-130
1,3,5-Trimethylbenzene	115	70-130
1,2,4-Trimethylbenzene	112	70-130
1,3-Dichlorobenzene	106	70-130
1,4-Dichlorobenzene	110	70-130
alpha-Chlorotoluene	103	70-130
1,2-Dichlorobenzene	105	70-130
1,2,4-Trichlorobenzene	95	70-130
Hexachlorobutadiene	96	70-130
Butane	94	60-140
Isopentane	96	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	108	70-130

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8/8/2018

Ms. Elizabeth Kunkel
AECOM
1001 Highlands Plaza Dr. West
Suite 300
St. Louis MO 63110

Project Name: Roxana Quarterly Soil Vapor
Project #: 60527968-01.04.003
Workorder #: 1807449B

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 7/26/2018 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

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WORK ORDER #: 1807449B

Work Order Summary

CLIENT:	Ms. Elizabeth Kunkel AECOM 1001 Highlands Plaza Dr. West Suite 300 St. Louis, MO 63110	**BILL TO:**	Accounts Payable Austin AECOM PO Box 203970 Austin, TX 78720
PHONE:	314-743-4179	**P.O. #**	60527968-0104003
FAX:		**PROJECT #**	60527968-01.04.003 Roxana Quarterly Soil Vapor
DATE RECEIVED:	07/26/2018	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	08/08/2018		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-072518	Modified ASTM D-1946	5.1 "Hg	15.8 psi
02A	VMP-15-21.5-072518	Modified ASTM D-1946	4.9 "Hg	14.7 psi
03A	VMP-15-25.5-072518	Modified ASTM D-1946	5.1 "Hg	15.7 psi
04A	VMP-15-29-072518	Modified ASTM D-1946	6.3 "Hg	15.3 psi
05A	VMP-55-20-072518	Modified ASTM D-1946	5.7 "Hg	15 psi
06A	Lab Blank	Modified ASTM D-1946	NA	NA
06B	Lab Blank	Modified ASTM D-1946	NA	NA
07A	LCS	Modified ASTM D-1946	NA	NA
07AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 08/08/18

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-16-11, UT NELAP CA0093332016-7, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2016, Expiration date: 10/17/2017.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
Modified ASTM D-1946
AECOM
Workorder# 1807449B

Five 1 Liter Summa Canister samples were received on July 26, 2018. 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

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

Client Sample ID: VMP-15-5-072518

Lab ID#: 1807449B-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	12
Nitrogen	0.25	81
Carbon Dioxide	0.025	6.6

Client Sample ID: VMP-15-21.5-072518

Lab ID#: 1807449B-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	1.6
Nitrogen	0.24	87
Methane	0.00024	0.32
Carbon Dioxide	0.024	11
Helium	0.12	0.011 J

Client Sample ID: VMP-15-25.5-072518

Lab ID#: 1807449B-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	1.5
Nitrogen	0.25	82
Methane	0.00025	0.71
Carbon Dioxide	0.025	16
Ethane	0.0025	0.00027 J
Helium	0.12	0.010 J

Client Sample ID: VMP-15-29-072518

Lab ID#: 1807449B-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	1.5
Nitrogen	0.26	83
Methane	0.00026	0.55

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

Client Sample ID: VMP-15-29-072518

Lab ID#: 1807449B-04A

Carbon Dioxide	0.026	15
Ethane	0.0026	0.00019 J
Helium	0.13	0.010 J

Client Sample ID: VMP-55-20-072518

Lab ID#: 1807449B-05A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	2.3
Nitrogen	0.25	78
Methane	0.00025	3.8
Carbon Dioxide	0.025	16
Ethane	0.0025	0.014

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Client Sample ID: VMP-15-5-072518

Lab ID#: 1807449B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080406**	**Date of Collection: 7/25/18 9:17:00 AM**	
Dil. Factor:	**2.50**	**Date of Analysis: 8/4/18 07:23 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	12
Nitrogen	0.25	81
Carbon Monoxide	0.025	Not Detected
Methane	0.00025	Not Detected
Carbon Dioxide	0.025	6.6
Ethane	0.0025	Not Detected
Ethene	0.0025	Not Detected
Helium	0.12	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-21.5-072518

Lab ID#: 1807449B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080407**	**Date of Collection: 7/25/18 9:31:00 AM**	
Dil. Factor:	**2.39**	**Date of Analysis: 8/4/18 07:45 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	1.6
Nitrogen	0.24	87
Carbon Monoxide	0.024	Not Detected
Methane	0.00024	0.32
Carbon Dioxide	0.024	11
Ethane	0.0024	Not Detected
Ethene	0.0024	Not Detected
Helium	0.12	0.011 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-25.5-072518

Lab ID#: 1807449B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080408**	**Date of Collection: 7/25/18 9:47:00 AM**	
Dil. Factor:	**2.49**	**Date of Analysis: 8/4/18 08:14 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	1.5
Nitrogen	0.25	82
Carbon Monoxide	0.025	Not Detected
Methane	0.00025	0.71
Carbon Dioxide	0.025	16
Ethane	0.0025	0.00027 J
Ethene	0.0025	Not Detected
Helium	0.12	0.010 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-29-072518

Lab ID#: 1807449B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080409**	**Date of Collection: 7/25/18 10:04:00 AM**	
Dil. Factor:	**2.59**	**Date of Analysis: 8/4/18 08:38 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	1.5
Nitrogen	0.26	83
Carbon Monoxide	0.026	Not Detected
Methane	0.00026	0.55
Carbon Dioxide	0.026	15
Ethane	0.0026	0.00019 J
Ethene	0.0026	Not Detected
Helium	0.13	0.010 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-55-20-072518

Lab ID#: 1807449B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080410**	**Date of Collection:**	**7/25/18 11:21:00 AM**
Dil. Factor:	**2.50**	**Date of Analysis:**	**8/4/18 09:03 AM**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	2.3
Nitrogen	0.25	78
Carbon Monoxide	0.025	Not Detected
Methane	0.00025	3.8
Carbon Dioxide	0.025	16
Ethane	0.0025	0.014
Ethene	0.0025	Not Detected
Helium	0.12	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: Lab Blank

Lab ID#: 1807449B-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080404a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/3/18 09:51 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	0.013 J
Nitrogen	0.10	0.046 J
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

J = Estimated value.

Container Type: NA - Not Applicable

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Client Sample ID: Lab Blank

Lab ID#: 1807449B-06B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080405c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/3/18 10:14 PM**	

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

Container Type: NA - Not Applicable

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Client Sample ID: LCS

Lab ID#: 1807449B-07A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080402**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/3/18 09:02 PM**	

Compound	%Recovery	Method Limits
Oxygen	106	85-115
Nitrogen	90	85-115
Carbon Monoxide	90	85-115
Methane	103	85-115
Carbon Dioxide	97	85-115
Ethane	100	85-115
Ethene	98	85-115
Helium	101	85-115

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 1807449B-07AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10080417**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/18 12:04 PM**	

Compound	%Recovery	Method Limits
Oxygen	104	85-115
Nitrogen	90	85-115
Carbon Monoxide	90	85-115
Methane	108	85-115
Carbon Dioxide	97	85-115
Ethane	105	85-115
Ethene	104	85-115
Helium	101	85-115

Container Type: NA - Not Applicable