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February 8, 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).

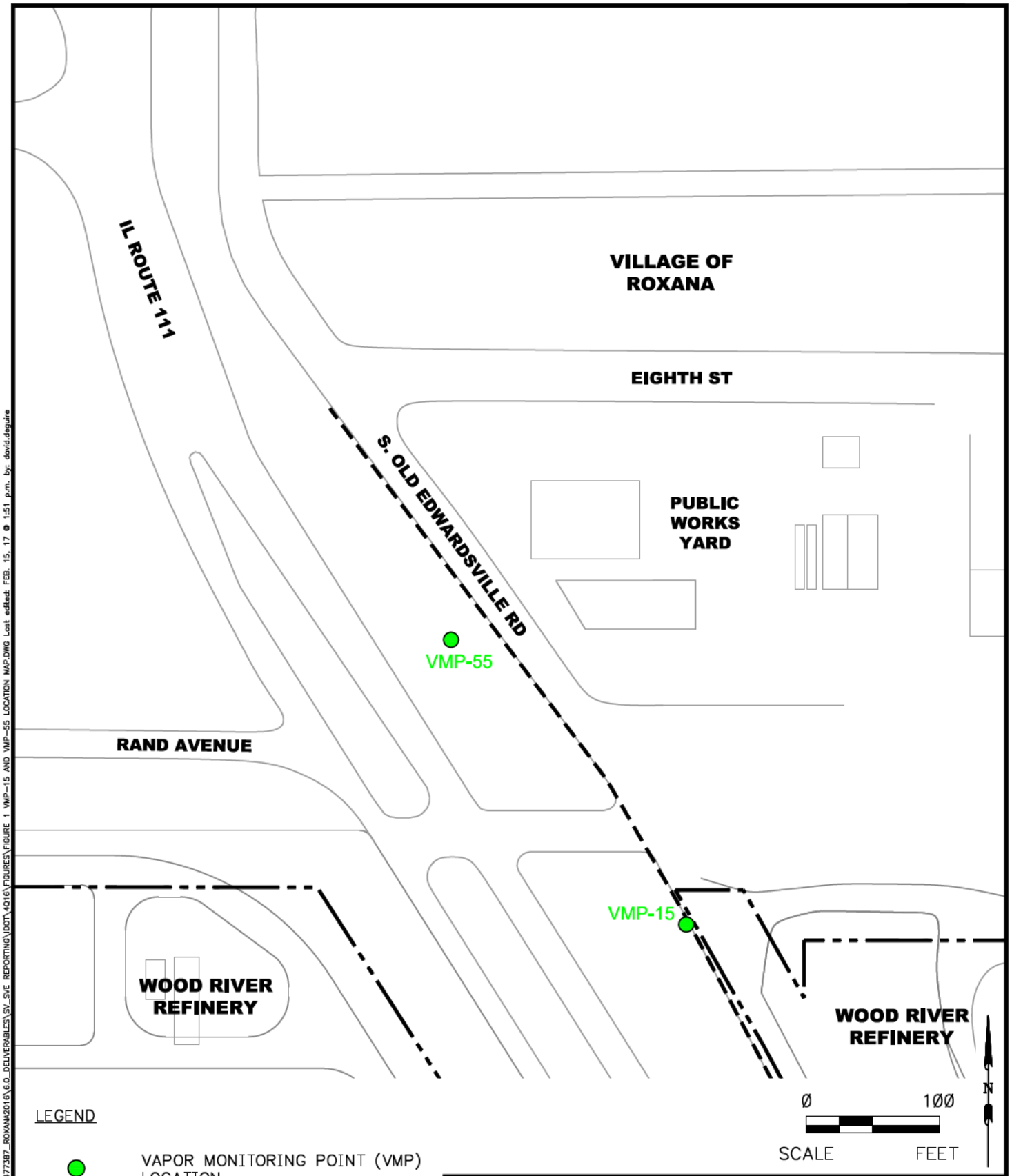
Sincerely,
AECOM, on behalf of Shell Oil Products US

Samuel Fisher
Environmental Scientist

Robert E. Mooshegian, STS
Senior Program Manager

Attachments

cc: Kevin Dyer, SOPUS
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

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11/14/2018
Ms. Elizabeth Kunkel
AECOM
100 N. Broadway, 20th Floor

St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60527968-01.04.004
Workorder #: 1811024A

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 11/1/2018 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 #: 1811024A

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. #**	60527968-0104004
FAX:		**PROJECT #**	60527968-01.04.004 Roxana Quarterly Soil Vapor
DATE RECEIVED:	11/01/2018	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/14/2018		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-55-5-103018	TO-15	3.3 "Hg	15.5 psi
02A	VMP-55-20-103018	TO-15	6.5 "Hg	14.9 psi
03A	VMP-15-5-103018	TO-15	4.5 "Hg	15.4 psi
04A	VMP-15-21.5-103018	TO-15	5.1 "Hg	15.3 psi
05A	VMP-15-25.5-103018	TO-15	5.1 "Hg	15.3 psi
06A	VMP-15-29-103018	TO-15	3.9 "Hg	15.2 psi
07A	Lab Blank	TO-15	NA	NA
07B	Lab Blank	TO-15	NA	NA
08A	CCV	TO-15	NA	NA
08B	CCV	TO-15	NA	NA
09A	LCS	TO-15	NA	NA
09AA	LCSD	TO-15	NA	NA
09B	LCS	TO-15	NA	NA
09BB	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/14/18

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP - E8 , LA NELAP - 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP CA009332018-10, VA NELAP - 9505, 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 LLC. certifies that the test results contained in this report meet all requirements of the NELAC standards

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

LABORATORY NARRATIVE
EPA Method TO-15
AECOM
Workorder# 1811024A

Six 1 Liter Summa Canister samples were received on November 01, 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 may be false positives.

The Relative Percent Difference (RPD) of the LCS/LCSD exceeded acceptance limits for 1,3-Butadiene.

Dilution was performed on sample VMP-55-20-103018 due to the presence of high level target species.

High concentrations of VOCs in sample VMP-55-20-103018 required an off-line dilution using a Tedlar bag. Toluene is a common contaminant in Tedlar bags, and a CN-flag was applied to Toluene concentrations 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-55-5-103018

Lab ID#: 1811024A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.48 J	5.7	2.4 J
Ethanol	4.6	5.6	8.7	11
Acetone	12	3.6 J	27	8.6 J
Carbon Disulfide	4.6	0.39 J	14	1.2 J
Chloroform	1.2	0.46 J	5.6	2.3 J
2,2,4-Trimethylpentane	1.2	4.3	5.4	20

Client Sample ID: VMP-55-20-103018

Lab ID#: 1811024A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	1700	1500 J	3200	2900 J
Acetone	4300	5600	10000	13000
Methylene Chloride	4300	1300 J	15000	4700 J
Hexane	430	550	1500	1900
Cyclohexane	430	1200	1500	4200
2,2,4-Trimethylpentane	430	24000	2000	110000
Toluene	430	1400 CN	1600	5500 CN
m,p-Xylene	430	270 J	1800	1200 J
Butane	1700	8600	4100	20000
Isopentane	1700	110000	5000	320000

Client Sample ID: VMP-15-5-103018

Lab ID#: 1811024A-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.53 J	6.0	2.6 J
Ethanol	4.8	4.6 J	9.1	8.8 J
Acetone	12	4.7 J	29	11 J
2,2,4-Trimethylpentane	1.2	0.26 J	5.6	1.2 J
Benzene	1.2	0.63 J	3.8	2.0 J
Toluene	1.2	0.68 J	4.5	2.5 J
m,p-Xylene	1.2	0.19 J	5.2	0.84 J

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

Client Sample ID: VMP-15-5-103018

Lab ID#: 1811024A-03A

Client Sample ID: VMP-15-21.5-103018

Lab ID#: 1811024A-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.34 J	6.1	1.7 J
Ethanol	4.9	12	9.3	23
Acetone	12	9.1 J	29	22 J
2-Propanol	4.9	1.4 J	12	3.4 J
Carbon Disulfide	4.9	0.30 J	15	0.94 J
Hexane	1.2	0.39 J	4.3	1.4 J
2-Butanone (Methyl Ethyl Ketone)	4.9	1.8 J	14	5.3 J
Chloroform	1.2	0.96 J	6.0	4.7 J

Client Sample ID: VMP-15-25.5-103018

Lab ID#: 1811024A-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.32 J	6.1	1.6 J
Ethanol	4.9	10	9.3	19
Acetone	12	7.2 J	29	17 J
Carbon Disulfide	4.9	0.39 J	15	1.2 J
Benzene	1.2	0.44 J	3.9	1.4 J

Client Sample ID: VMP-15-29-103018

Lab ID#: 1811024A-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	12	5.3 J	28	12 J
Chloroform	1.2	1.2	5.7	6.0
Benzene	1.2	0.38 J	3.7	1.2 J
Butane	4.7	1.9 J	11	4.6 J

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Client Sample ID: VMP-55-5-103018

Lab ID#: 1811024A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110806**	**Date of Collection:**	**10/30/18 10:58:00 A**
Dil. Factor:	**2.31**	**Date of Analysis:**	**11/8/18 02:33 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.48 J	5.7	2.4 J
Freon 114	1.2	Not Detected	8.1	Not Detected
Chloromethane	12	Not Detected	24	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	45	Not Detected
Chloroethane	4.6	Not Detected	12	Not Detected
Freon 11	1.2	Not Detected	6.5	Not Detected
Ethanol	4.6	5.6	8.7	11
Freon 113	1.2	Not Detected	8.8	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Acetone	12	3.6 J	27	8.6 J
2-Propanol	4.6	Not Detected	11	Not Detected
Carbon Disulfide	4.6	0.39 J	14	1.2 J
3-Chloropropene	4.6	Not Detected	14	Not Detected
Methylene Chloride	12	Not Detected	40	Not Detected
Methyl tert-butyl ether	4.6	Not Detected	17	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Hexane	1.2	Not Detected	4.1	Not Detected
1,1-Dichloroethane	1.2	Not Detected	4.7	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.6	Not Detected	14	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.4	Not Detected
Chloroform	1.2	0.46 J	5.6	2.3 J
1,1,1-Trichloroethane	1.2	Not Detected	6.3	Not Detected
Cyclohexane	1.2	Not Detected	4.0	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.3	Not Detected
2,2,4-Trimethylpentane	1.2	4.3	5.4	20
Benzene	1.2	Not Detected	3.7	Not Detected
1,2-Dichloroethane	1.2	Not Detected	4.7	Not Detected
Heptane	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	Not Detected	6.2	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.3	Not Detected
1,4-Dioxane	4.6	Not Detected	17	Not Detected
Bromodichloromethane	1.2	Not Detected	7.7	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.2	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	4.7	Not Detected
Toluene	1.2	Not Detected	4.4	Not Detected
trans-1,3-Dichloropropene	1.2	Not Detected	5.2	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.3	Not Detected
Tetrachloroethene	1.2	Not Detected	7.8	Not Detected
2-Hexanone	4.6	Not Detected	19	Not Detected

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Client Sample ID: VMP-55-5-103018

Lab ID#: 1811024A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110806**	**Date of Collection:**	**10/30/18 10:58:00 A**
Dil. Factor:	**2.31**	**Date of Analysis:**	**11/8/18 02:33 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.2	Not Detected	9.8	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	8.9	Not Detected
Chlorobenzene	1.2	Not Detected	5.3	Not Detected
Ethyl Benzene	1.2	Not Detected	5.0	Not Detected
m,p-Xylene	1.2	Not Detected	5.0	Not Detected
o-Xylene	1.2	Not Detected	5.0	Not Detected
Styrene	1.2	Not Detected	4.9	Not Detected
Bromoform	1.2	Not Detected	12	Not Detected
Cumene	1.2	Not Detected	5.7	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	7.9	Not Detected
Propylbenzene	1.2	Not Detected	5.7	Not Detected
4-Ethyltoluene	1.2	Not Detected	5.7	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	5.7	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	5.7	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.0	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	6.9	Not Detected
1,2,4-Trichlorobenzene	4.6	Not Detected	34	Not Detected
Hexachlorobutadiene	4.6	Not Detected	49	Not Detected
Butane	4.6	Not Detected	11	Not Detected
Isopentane	4.6	Not Detected	14	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: VMP-55-20-103018

Lab ID#: 1811024A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j111231**	**Date of Collection:**	**10/30/18 11:14:00 A**
Dil. Factor:	**856**	**Date of Analysis:**	**11/13/18 02:07 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	430	Not Detected	2100	Not Detected
Freon 114	430	Not Detected	3000	Not Detected
Chloromethane	4300	Not Detected	8800	Not Detected
Vinyl Chloride	430	Not Detected	1100	Not Detected
1,3-Butadiene	430	Not Detected	950	Not Detected
Bromomethane	4300	Not Detected	17000	Not Detected
Chloroethane	1700	Not Detected	4500	Not Detected
Freon 11	430	Not Detected	2400	Not Detected
Ethanol	1700	1500 J	3200	2900 J
Freon 113	430	Not Detected	3300	Not Detected
1,1-Dichloroethene	430	Not Detected	1700	Not Detected
Acetone	4300	5600	10000	13000
2-Propanol	1700	Not Detected	4200	Not Detected
Carbon Disulfide	1700	Not Detected	5300	Not Detected
3-Chloropropene	1700	Not Detected	5400	Not Detected
Methylene Chloride	4300	1300 J	15000	4700 J
Methyl tert-butyl ether	1700	Not Detected	6200	Not Detected
trans-1,2-Dichloroethene	430	Not Detected	1700	Not Detected
Hexane	430	550	1500	1900
1,1-Dichloroethane	430	Not Detected	1700	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1700	Not Detected	5000	Not Detected
cis-1,2-Dichloroethene	430	Not Detected	1700	Not Detected
Tetrahydrofuran	430	Not Detected	1300	Not Detected
Chloroform	430	Not Detected	2100	Not Detected
1,1,1-Trichloroethane	430	Not Detected	2300	Not Detected
Cyclohexane	430	1200	1500	4200
Carbon Tetrachloride	430	Not Detected	2700	Not Detected
2,2,4-Trimethylpentane	430	24000	2000	110000
Benzene	430	Not Detected	1400	Not Detected
1,2-Dichloroethane	430	Not Detected	1700	Not Detected
Heptane	430	Not Detected	1800	Not Detected
Trichloroethene	430	Not Detected	2300	Not Detected
1,2-Dichloropropane	430	Not Detected	2000	Not Detected
1,4-Dioxane	1700	Not Detected	6200	Not Detected
Bromodichloromethane	430	Not Detected	2900	Not Detected
cis-1,3-Dichloropropene	430	Not Detected	1900	Not Detected
4-Methyl-2-pentanone	430	Not Detected	1800	Not Detected
Toluene	430	1400 CN	1600	5500 CN
trans-1,3-Dichloropropene	430	Not Detected	1900	Not Detected
1,1,2-Trichloroethane	430	Not Detected	2300	Not Detected
Tetrachloroethene	430	Not Detected	2900	Not Detected
2-Hexanone	1700	Not Detected	7000	Not Detected

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Client Sample ID: VMP-55-20-103018

Lab ID#: 1811024A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j111231**	**Date of Collection:**	**10/30/18 11:14:00 A**
Dil. Factor:	**856**	**Date of Analysis:**	**11/13/18 02:07 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	430	Not Detected	3600	Not Detected
1,2-Dibromoethane (EDB)	430	Not Detected	3300	Not Detected
Chlorobenzene	430	Not Detected	2000	Not Detected
Ethyl Benzene	430	Not Detected	1800	Not Detected
m,p-Xylene	430	270 J	1800	1200 J
o-Xylene	430	Not Detected	1800	Not Detected
Styrene	430	Not Detected	1800	Not Detected
Bromoform	430	Not Detected	4400	Not Detected
Cumene	430	Not Detected	2100	Not Detected
1,1,2,2-Tetrachloroethane	430	Not Detected	2900	Not Detected
Propylbenzene	430	Not Detected	2100	Not Detected
4-Ethyltoluene	430	Not Detected	2100	Not Detected
1,3,5-Trimethylbenzene	430	Not Detected	2100	Not Detected
1,2,4-Trimethylbenzene	430	Not Detected	2100	Not Detected
1,3-Dichlorobenzene	430	Not Detected	2600	Not Detected
1,4-Dichlorobenzene	430	Not Detected	2600	Not Detected
alpha-Chlorotoluene	430	Not Detected	2200	Not Detected
1,2-Dichlorobenzene	430	Not Detected	2600	Not Detected
1,2,4-Trichlorobenzene	1700	Not Detected	13000	Not Detected
Hexachlorobutadiene	1700	Not Detected	18000	Not Detected
Butane	1700	8600	4100	20000
Isopentane	1700	110000	5000	320000

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

Surrogates	%Recovery	Method Limits
Toluene-d8	107	70-130
1,2-Dichloroethane-d4	123	70-130
4-Bromofluorobenzene	116	70-130

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Client Sample ID: VMP-15-5-103018

Lab ID#: 1811024A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110807**	**Date of Collection:**	**10/30/18 12:26:00 P**
Dil. Factor:	**2.41**	**Date of Analysis:**	**11/8/18 03:00 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.53 J	6.0	2.6 J
Freon 114	1.2	Not Detected	8.4	Not Detected
Chloromethane	12	Not Detected	25	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	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	Not Detected	6.8	Not Detected
Ethanol	4.8	4.6 J	9.1	8.8 J
Freon 113	1.2	Not Detected	9.2	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	4.7 J	29	11 J
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	4.2	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	Not Detected	5.9	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
Cyclohexane	1.2	Not Detected	4.1	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.6	Not Detected
2,2,4-Trimethylpentane	1.2	0.26 J	5.6	1.2 J
Benzene	1.2	0.63 J	3.8	2.0 J
1,2-Dichloroethane	1.2	Not Detected	4.9	Not Detected
Heptane	1.2	Not Detected	4.9	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	4.9	Not Detected
Toluene	1.2	0.68 J	4.5	2.5 J
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

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Client Sample ID: VMP-15-5-103018

Lab ID#: 1811024A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110807**	**Date of Collection:**	**10/30/18 12:26:00 P**
Dil. Factor:	**2.41**	**Date of Analysis:**	**11/8/18 03:00 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	0.19 J	5.2	0.84 J
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	8.3	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	7.2	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	36	Not Detected
Hexachlorobutadiene	4.8	Not Detected	51	Not Detected
Butane	4.8	Not Detected	11	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	106	70-130
1,2-Dichloroethane-d4	92	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: VMP-15-21.5-103018

Lab ID#: 1811024A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110808**	**Date of Collection:**	**10/30/18 12:40:00 P**
Dil. Factor:	**2.46**	**Date of Analysis:**	**11/8/18 03:26 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.34 J	6.1	1.7 J
Freon 114	1.2	Not Detected	8.6	Not Detected
Chloromethane	12	Not Detected	25	Not Detected
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	48	Not Detected
Chloroethane	4.9	Not Detected	13	Not Detected
Freon 11	1.2	Not Detected	6.9	Not Detected
Ethanol	4.9	12	9.3	23
Freon 113	1.2	Not Detected	9.4	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Acetone	12	9.1 J	29	22 J
2-Propanol	4.9	1.4 J	12	3.4 J
Carbon Disulfide	4.9	0.30 J	15	0.94 J
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	0.39 J	4.3	1.4 J
1,1-Dichloroethane	1.2	Not Detected	5.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.9	1.8 J	14	5.3 J
cis-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.6	Not Detected
Chloroform	1.2	0.96 J	6.0	4.7 J
1,1,1-Trichloroethane	1.2	Not Detected	6.7	Not Detected
Cyclohexane	1.2	Not Detected	4.2	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.7	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.7	Not Detected
Benzene	1.2	Not Detected	3.9	Not Detected
1,2-Dichloroethane	1.2	Not Detected	5.0	Not Detected
Heptane	1.2	Not Detected	5.0	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	8.2	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	Not Detected	4.6	Not Detected
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	8.3	Not Detected
2-Hexanone	4.9	Not Detected	20	Not Detected

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Client Sample ID: VMP-15-21.5-103018

Lab ID#: 1811024A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110808**	**Date of Collection:**	**10/30/18 12:40:00 P**
Dil. Factor:	**2.46**	**Date of Analysis:**	**11/8/18 03:26 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	9.4	Not Detected
Chlorobenzene	1.2	Not Detected	5.7	Not Detected
Ethyl Benzene	1.2	Not Detected	5.3	Not Detected
m,p-Xylene	1.2	Not Detected	5.3	Not Detected
o-Xylene	1.2	Not Detected	5.3	Not Detected
Styrene	1.2	Not Detected	5.2	Not Detected
Bromoform	1.2	Not Detected	13	Not Detected
Cumene	1.2	Not Detected	6.0	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.4	Not Detected
Propylbenzene	1.2	Not Detected	6.0	Not Detected
4-Ethyltoluene	1.2	Not Detected	6.0	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	6.0	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	6.0	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
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	36	Not Detected
Hexachlorobutadiene	4.9	Not Detected	52	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	94	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VMP-15-25.5-103018

Lab ID#: 1811024A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110809**	**Date of Collection:**	**10/30/18 12:58:00 P**
Dil. Factor:	**2.46**	**Date of Analysis:**	**11/8/18 03:53 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.32 J	6.1	1.6 J
Freon 114	1.2	Not Detected	8.6	Not Detected
Chloromethane	12	Not Detected	25	Not Detected
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	48	Not Detected
Chloroethane	4.9	Not Detected	13	Not Detected
Freon 11	1.2	Not Detected	6.9	Not Detected
Ethanol	4.9	10	9.3	19
Freon 113	1.2	Not Detected	9.4	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Acetone	12	7.2 J	29	17 J
2-Propanol	4.9	Not Detected	12	Not Detected
Carbon Disulfide	4.9	0.39 J	15	1.2 J
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	4.3	Not Detected
1,1-Dichloroethane	1.2	Not Detected	5.0	Not Detected
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	Not Detected	6.0	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.7	Not Detected
Cyclohexane	1.2	Not Detected	4.2	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.7	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.7	Not Detected
Benzene	1.2	0.44 J	3.9	1.4 J
1,2-Dichloroethane	1.2	Not Detected	5.0	Not Detected
Heptane	1.2	Not Detected	5.0	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	8.2	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	Not Detected	4.6	Not Detected
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	8.3	Not Detected
2-Hexanone	4.9	Not Detected	20	Not Detected

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Client Sample ID: VMP-15-25.5-103018

Lab ID#: 1811024A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110809**	**Date of Collection:**	**10/30/18 12:58:00 P**
Dil. Factor:	**2.46**	**Date of Analysis:**	**11/8/18 03:53 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	9.4	Not Detected
Chlorobenzene	1.2	Not Detected	5.7	Not Detected
Ethyl Benzene	1.2	Not Detected	5.3	Not Detected
m,p-Xylene	1.2	Not Detected	5.3	Not Detected
o-Xylene	1.2	Not Detected	5.3	Not Detected
Styrene	1.2	Not Detected	5.2	Not Detected
Bromoform	1.2	Not Detected	13	Not Detected
Cumene	1.2	Not Detected	6.0	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.4	Not Detected
Propylbenzene	1.2	Not Detected	6.0	Not Detected
4-Ethyltoluene	1.2	Not Detected	6.0	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	6.0	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	6.0	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
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	36	Not Detected
Hexachlorobutadiene	4.9	Not Detected	52	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	113	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: VMP-15-29-103018

Lab ID#: 1811024A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110810**	**Date of Collection:**	**10/30/18 1:14:00 PM**
Dil. Factor:	**2.34**	**Date of Analysis:**	**11/8/18 04:19 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	Not Detected	5.8	Not Detected
Freon 114	1.2	Not Detected	8.2	Not Detected
Chloromethane	12	Not Detected	24	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	45	Not Detected
Chloroethane	4.7	Not Detected	12	Not Detected
Freon 11	1.2	Not Detected	6.6	Not Detected
Ethanol	4.7	Not Detected	8.8	Not Detected
Freon 113	1.2	Not Detected	9.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Acetone	12	5.3 J	28	12 J
2-Propanol	4.7	Not Detected	12	Not Detected
Carbon Disulfide	4.7	Not Detected	14	Not Detected
3-Chloropropene	4.7	Not Detected	15	Not Detected
Methylene Chloride	12	Not Detected	41	Not Detected
Methyl tert-butyl ether	4.7	Not Detected	17	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Hexane	1.2	Not Detected	4.1	Not Detected
1,1-Dichloroethane	1.2	Not Detected	4.7	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.7	Not Detected	14	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.4	Not Detected
Chloroform	1.2	1.2	5.7	6.0
1,1,1-Trichloroethane	1.2	Not Detected	6.4	Not Detected
Cyclohexane	1.2	Not Detected	4.0	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.4	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.5	Not Detected
Benzene	1.2	0.38 J	3.7	1.2 J
1,2-Dichloroethane	1.2	Not Detected	4.7	Not Detected
Heptane	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.3	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.4	Not Detected
1,4-Dioxane	4.7	Not Detected	17	Not Detected
Bromodichloromethane	1.2	Not Detected	7.8	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.3	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	4.8	Not Detected
Toluene	1.2	Not Detected	4.4	Not Detected
trans-1,3-Dichloropropene	1.2	Not Detected	5.3	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.4	Not Detected
Tetrachloroethene	1.2	Not Detected	7.9	Not Detected
2-Hexanone	4.7	Not Detected	19	Not Detected

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Client Sample ID: VMP-15-29-103018

Lab ID#: 1811024A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110810**	**Date of Collection:**	**10/30/18 1:14:00 PM**
Dil. Factor:	**2.34**	**Date of Analysis:**	**11/8/18 04:19 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	9.0	Not Detected
Chlorobenzene	1.2	Not Detected	5.4	Not Detected
Ethyl Benzene	1.2	Not Detected	5.1	Not Detected
m,p-Xylene	1.2	Not Detected	5.1	Not Detected
o-Xylene	1.2	Not Detected	5.1	Not Detected
Styrene	1.2	Not Detected	5.0	Not Detected
Bromoform	1.2	Not Detected	12	Not Detected
Cumene	1.2	Not Detected	5.8	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.0	Not Detected
Propylbenzene	1.2	Not Detected	5.8	Not Detected
4-Ethyltoluene	1.2	Not Detected	5.8	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	5.8	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	5.8	Not Detected
1,3-Dichlorobenzene	1.2	Not Detected	7.0	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.0	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.0	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.0	Not Detected
1,2,4-Trichlorobenzene	4.7	Not Detected	35	Not Detected
Hexachlorobutadiene	4.7	Not Detected	50	Not Detected
Butane	4.7	1.9 J	11	4.6 J
Isopentane	4.7	Not Detected	14	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	88	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1811024A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110805a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/18 12:47 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	0.16 J	6.2	0.50 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#: 1811024A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110805a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/18 12:47 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	0.065 J	3.0	0.39 J
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	0.14 J	15	1.1 J
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	101	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1811024A-07B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j111206e**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/12/18 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	0.40 J	6.2	1.3 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#: 1811024A-07B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j111206e**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/12/18 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

J = Estimated value.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: CCV

Lab ID#: 1811024A-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110802**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/18 11:11 AM**

Compound	%Recovery
Freon 12	93
Freon 114	93
Chloromethane	100
Vinyl Chloride	92
1,3-Butadiene	88
Bromomethane	91
Chloroethane	92
Freon 11	90
Ethanol	82
Freon 113	91
1,1-Dichloroethene	95
Acetone	95
2-Propanol	85
Carbon Disulfide	90
3-Chloropropene	92
Methylene Chloride	88
Methyl tert-butyl ether	89
trans-1,2-Dichloroethene	93
Hexane	90
1,1-Dichloroethane	103
2-Butanone (Methyl Ethyl Ketone)	109
cis-1,2-Dichloroethene	111
Tetrahydrofuran	115
Chloroform	109
1,1,1-Trichloroethane	100
Cyclohexane	107
Carbon Tetrachloride	103
2,2,4-Trimethylpentane	103
Benzene	109
1,2-Dichloroethane	116
Heptane	121
Trichloroethene	104
1,2-Dichloropropane	101
1,4-Dioxane	98
Bromodichloromethane	104
cis-1,3-Dichloropropene	107
4-Methyl-2-pentanone	96
Toluene	99
trans-1,3-Dichloropropene	109
1,1,2-Trichloroethane	103
Tetrachloroethene	106
2-Hexanone	95

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Client Sample ID: CCV

Lab ID#: 1811024A-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/18 11:11 AM**	

Compound	%Recovery
Dibromochloromethane	108
1,2-Dibromoethane (EDB)	106
Chlorobenzene	103
Ethyl Benzene	103
m,p-Xylene	105
o-Xylene	108
Styrene	96
Bromoform	115
Cumene	104
1,1,2,2-Tetrachloroethane	103
Propylbenzene	102
4-Ethyltoluene	103
1,3,5-Trimethylbenzene	106
1,2,4-Trimethylbenzene	104
1,3-Dichlorobenzene	115
1,4-Dichlorobenzene	114
alpha-Chlorotoluene	121
1,2-Dichlorobenzene	116
1,2,4-Trichlorobenzene	112
Hexachlorobutadiene	114
Butane	90
Isopentane	84

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	87	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: CCV

Lab ID#: 1811024A-08B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j111202**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 11/12/18 07:47 AM**

Compound	%Recovery
Freon 12	120
Freon 114	107
Chloromethane	110
Vinyl Chloride	107
1,3-Butadiene	96
Bromomethane	99
Chloroethane	105
Freon 11	116
Ethanol	91
Freon 113	106
1,1-Dichloroethene	116
Acetone	104
2-Propanol	99
Carbon Disulfide	99
3-Chloropropene	96
Methylene Chloride	107
Methyl tert-butyl ether	102
trans-1,2-Dichloroethene	108
Hexane	97
1,1-Dichloroethane	104
2-Butanone (Methyl Ethyl Ketone)	93
cis-1,2-Dichloroethene	113
Tetrahydrofuran	95
Chloroform	110
1,1,1-Trichloroethane	111
Cyclohexane	98
Carbon Tetrachloride	112
2,2,4-Trimethylpentane	98
Benzene	94
1,2-Dichloroethane	110
Heptane	94
Trichloroethene	93
1,2-Dichloropropane	91
1,4-Dioxane	91
Bromodichloromethane	108
cis-1,3-Dichloropropene	90
4-Methyl-2-pentanone	94
Toluene	92
trans-1,3-Dichloropropene	101
1,1,2-Trichloroethane	98
Tetrachloroethene	102
2-Hexanone	94

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Client Sample ID: CCV

Lab ID#: 1811024A-08B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j111202**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/12/18 07:47 AM**	

Compound	%Recovery
Dibromochloromethane	108
1,2-Dibromoethane (EDB)	102
Chlorobenzene	93
Ethyl Benzene	99
m,p-Xylene	99
o-Xylene	99
Styrene	107
Bromoform	101
Cumene	108
1,1,2,2-Tetrachloroethane	98
Propylbenzene	104
4-Ethyltoluene	117
1,3,5-Trimethylbenzene	102
1,2,4-Trimethylbenzene	94
1,3-Dichlorobenzene	102
1,4-Dichlorobenzene	105
alpha-Chlorotoluene	106
1,2-Dichlorobenzene	100
1,2,4-Trichlorobenzene	88
Hexachlorobutadiene	93
Butane	110
Isopentane	94

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	85-117
1,2-Dichloroethane-d4	113	70-122
4-Bromofluorobenzene	104	75-121

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Client Sample ID: LCS

Lab ID#: 1811024A-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/18 11:56 AM**	

Compound	%Recovery	Method Limits
Freon 12	112	70-130
Freon 114	110	70-130
Chloromethane	105	70-130
Vinyl Chloride	87	70-130
1,3-Butadiene	76	70-130
Bromomethane	80	70-130
Chloroethane	96	70-130
Freon 11	98	70-130
Ethanol	115	70-130
Freon 113	104	70-130
1,1-Dichloroethene	104	70-130
Acetone	108	70-130
2-Propanol	108	70-130
Carbon Disulfide	106	70-130
3-Chloropropene	112	70-130
Methylene Chloride	100	70-130
Methyl tert-butyl ether	102	70-130
trans-1,2-Dichloroethene	118	70-130
Hexane	106	70-130
1,1-Dichloroethane	106	70-130
2-Butanone (Methyl Ethyl Ketone)	113	70-130
cis-1,2-Dichloroethene	100	70-130
Tetrahydrofuran	108	70-130
Chloroform	107	70-130
1,1,1-Trichloroethane	102	70-130
Cyclohexane	108	70-130
Carbon Tetrachloride	105	70-130
2,2,4-Trimethylpentane	107	70-130
Benzene	103	70-130
1,2-Dichloroethane	104	70-130
Heptane	111	70-130
Trichloroethene	107	70-130
1,2-Dichloropropane	103	70-130
1,4-Dioxane	105	70-130
Bromodichloromethane	109	70-130
cis-1,3-Dichloropropene	116	70-130
4-Methyl-2-pentanone	102	70-130
Toluene	101	70-130
trans-1,3-Dichloropropene	109	70-130
1,1,2-Trichloroethane	105	70-130
Tetrachloroethene	105	70-130
2-Hexanone	102	70-130

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Client Sample ID: LCS

Lab ID#: 1811024A-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/18 11:56 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	110	70-130
1,2-Dibromoethane (EDB)	106	70-130
Chlorobenzene	102	70-130
Ethyl Benzene	104	70-130
m,p-Xylene	107	70-130
o-Xylene	109	70-130
Styrene	103	70-130
Bromoform	118	70-130
Cumene	103	70-130
1,1,2,2-Tetrachloroethane	102	70-130
Propylbenzene	102	70-130
4-Ethyltoluene	105	70-130
1,3,5-Trimethylbenzene	108	70-130
1,2,4-Trimethylbenzene	106	70-130
1,3-Dichlorobenzene	103	70-130
1,4-Dichlorobenzene	104	70-130
alpha-Chlorotoluene	112	70-130
1,2-Dichlorobenzene	101	70-130
1,2,4-Trichlorobenzene	101	70-130
Hexachlorobutadiene	104	70-130
Butane	80	60-140
Isopentane	82	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: LCSD

Lab ID#: 1811024A-09AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110804**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/18 12:21 PM**	

Compound	%Recovery	Method Limits
Freon 12	102	70-130
Freon 114	101	70-130
Chloromethane	99	70-130
Vinyl Chloride	106	70-130
1,3-Butadiene	101	70-130
Bromomethane	101	70-130
Chloroethane	110	70-130
Freon 11	101	70-130
Ethanol	102	70-130
Freon 113	101	70-130
1,1-Dichloroethene	104	70-130
Acetone	102	70-130
2-Propanol	100	70-130
Carbon Disulfide	104	70-130
3-Chloropropene	110	70-130
Methylene Chloride	97	70-130
Methyl tert-butyl ether	101	70-130
trans-1,2-Dichloroethene	118	70-130
Hexane	103	70-130
1,1-Dichloroethane	104	70-130
2-Butanone (Methyl Ethyl Ketone)	108	70-130
cis-1,2-Dichloroethene	101	70-130
Tetrahydrofuran	108	70-130
Chloroform	106	70-130
1,1,1-Trichloroethane	101	70-130
Cyclohexane	107	70-130
Carbon Tetrachloride	104	70-130
2,2,4-Trimethylpentane	103	70-130
Benzene	103	70-130
1,2-Dichloroethane	104	70-130
Heptane	109	70-130
Trichloroethene	106	70-130
1,2-Dichloropropane	102	70-130
1,4-Dioxane	103	70-130
Bromodichloromethane	107	70-130
cis-1,3-Dichloropropene	114	70-130
4-Methyl-2-pentanone	98	70-130
Toluene	99	70-130
trans-1,3-Dichloropropene	108	70-130
1,1,2-Trichloroethane	106	70-130
Tetrachloroethene	106	70-130
2-Hexanone	103	70-130

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Client Sample ID: LCSD

Lab ID#: 1811024A-09AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a110804**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/8/18 12:21 PM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	111	70-130
1,2-Dibromoethane (EDB)	107	70-130
Chlorobenzene	102	70-130
Ethyl Benzene	105	70-130
m,p-Xylene	107	70-130
o-Xylene	110	70-130
Styrene	103	70-130
Bromoform	120	70-130
Cumene	104	70-130
1,1,2,2-Tetrachloroethane	103	70-130
Propylbenzene	104	70-130
4-Ethyltoluene	106	70-130
1,3,5-Trimethylbenzene	110	70-130
1,2,4-Trimethylbenzene	112	70-130
1,3-Dichlorobenzene	109	70-130
1,4-Dichlorobenzene	112	70-130
alpha-Chlorotoluene	118	70-130
1,2-Dichlorobenzene	108	70-130
1,2,4-Trichlorobenzene	108	70-130
Hexachlorobutadiene	110	70-130
Butane	98	60-140
Isopentane	94	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	92	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: LCS

Lab ID#: 1811024A-09B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j111203**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/12/18 08:11 AM**	

Compound	%Recovery	Method Limits
Freon 12	121	70-130
Freon 114	107	70-130
Chloromethane	118	70-130
Vinyl Chloride	108	70-130
1,3-Butadiene	95	70-130
Bromomethane	108	70-130
Chloroethane	107	70-130
Freon 11	117	70-130
Ethanol	97	70-130
Freon 113	104	70-130
1,1-Dichloroethene	110	70-130
Acetone	107	70-130
2-Propanol	102	70-130
Carbon Disulfide	102	70-130
3-Chloropropene	99	70-130
Methylene Chloride	112	70-130
Methyl tert-butyl ether	105	70-130
trans-1,2-Dichloroethene	117	70-130
Hexane	100	70-130
1,1-Dichloroethane	105	70-130
2-Butanone (Methyl Ethyl Ketone)	97	70-130
cis-1,2-Dichloroethene	97	70-130
Tetrahydrofuran	99	70-130
Chloroform	109	70-130
1,1,1-Trichloroethane	113	70-130
Cyclohexane	103	70-130
Carbon Tetrachloride	113	70-130
2,2,4-Trimethylpentane	102	70-130
Benzene	99	70-130
1,2-Dichloroethane	114	70-130
Heptane	103	70-130
Trichloroethene	97	70-130
1,2-Dichloropropane	90	70-130
1,4-Dioxane	102	70-130
Bromodichloromethane	114	70-130
cis-1,3-Dichloropropene	101	70-130
4-Methyl-2-pentanone	94	70-130
Toluene	95	70-130
trans-1,3-Dichloropropene	100	70-130
1,1,2-Trichloroethane	101	70-130
Tetrachloroethene	101	70-130
2-Hexanone	100	70-130

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Client Sample ID: LCS

Lab ID#: 1811024A-09B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j111203**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/12/18 08:11 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	108	70-130
1,2-Dibromoethane (EDB)	104	70-130
Chlorobenzene	94	70-130
Ethyl Benzene	103	70-130
m,p-Xylene	103	70-130
o-Xylene	101	70-130
Styrene	106	70-130
Bromoform	109	70-130
Cumene	108	70-130
1,1,2,2-Tetrachloroethane	97	70-130
Propylbenzene	104	70-130
4-Ethyltoluene	112	70-130
1,3,5-Trimethylbenzene	101	70-130
1,2,4-Trimethylbenzene	95	70-130
1,3-Dichlorobenzene	106	70-130
1,4-Dichlorobenzene	108	70-130
alpha-Chlorotoluene	113	70-130
1,2-Dichlorobenzene	101	70-130
1,2,4-Trichlorobenzene	102	70-130
Hexachlorobutadiene	103	70-130
Butane	103	60-140
Isopentane	94	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: LCSD

Lab ID#: 1811024A-09BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j111204**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/12/18 08:36 AM**	

Compound	%Recovery	Method Limits
Freon 12	111	70-130
Freon 114	97	70-130
Chloromethane	106	70-130
Vinyl Chloride	103	70-130
1,3-Butadiene	92	70-130
Bromomethane	97	70-130
Chloroethane	103	70-130
Freon 11	105	70-130
Ethanol	90	70-130
Freon 113	94	70-130
1,1-Dichloroethene	100	70-130
Acetone	97	70-130
2-Propanol	99	70-130
Carbon Disulfide	96	70-130
3-Chloropropene	99	70-130
Methylene Chloride	100	70-130
Methyl tert-butyl ether	97	70-130
trans-1,2-Dichloroethene	105	70-130
Hexane	94	70-130
1,1-Dichloroethane	96	70-130
2-Butanone (Methyl Ethyl Ketone)	91	70-130
cis-1,2-Dichloroethene	100	70-130
Tetrahydrofuran	90	70-130
Chloroform	98	70-130
1,1,1-Trichloroethane	104	70-130
Cyclohexane	93	70-130
Carbon Tetrachloride	104	70-130
2,2,4-Trimethylpentane	96	70-130
Benzene	98	70-130
1,2-Dichloroethane	111	70-130
Heptane	101	70-130
Trichloroethene	95	70-130
1,2-Dichloropropane	93	70-130
1,4-Dioxane	98	70-130
Bromodichloromethane	108	70-130
cis-1,3-Dichloropropene	103	70-130
4-Methyl-2-pentanone	96	70-130
Toluene	91	70-130
trans-1,3-Dichloropropene	106	70-130
1,1,2-Trichloroethane	105	70-130
Tetrachloroethene	102	70-130
2-Hexanone	102	70-130

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Client Sample ID: LCSD

Lab ID#: 1811024A-09BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j111204**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/12/18 08:36 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	113	70-130
1,2-Dibromoethane (EDB)	109	70-130
Chlorobenzene	98	70-130
Ethyl Benzene	105	70-130
m,p-Xylene	103	70-130
o-Xylene	106	70-130
Styrene	112	70-130
Bromoform	110	70-130
Cumene	115	70-130
1,1,2,2-Tetrachloroethane	102	70-130
Propylbenzene	110	70-130
4-Ethyltoluene	112	70-130
1,3,5-Trimethylbenzene	108	70-130
1,2,4-Trimethylbenzene	101	70-130
1,3-Dichlorobenzene	109	70-130
1,4-Dichlorobenzene	115	70-130
alpha-Chlorotoluene	116	70-130
1,2-Dichlorobenzene	108	70-130
1,2,4-Trichlorobenzene	106	70-130
Hexachlorobutadiene	110	70-130
Butane	98	60-140
Isopentane	90	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	113	70-130

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11/14/2018
Ms. Elizabeth Kunkel
AECOM
100 N. Broadway, 20th Floor

St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60527968-01.04.004
Workorder #: 1811024B

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 11/1/2018 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 #: 1811024B

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. #**	60527968-0104004
FAX:		**PROJECT #**	60527968-01.04.004 Roxana Quarterly Soil Vapor
DATE RECEIVED:	11/01/2018	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/14/2018		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-55-5-103018	Modified ASTM D-1946	3.3 "Hg	15.5 psi
02A	VMP-55-20-103018	Modified ASTM D-1946	6.5 "Hg	14.9 psi
03A	VMP-15-5-103018	Modified ASTM D-1946	4.5 "Hg	15.4 psi
04A	VMP-15-21.5-103018	Modified ASTM D-1946	5.1 "Hg	15.3 psi
05A	VMP-15-25.5-103018	Modified ASTM D-1946	5.1 "Hg	15.3 psi
06A	VMP-15-29-103018	Modified ASTM D-1946	3.9 "Hg	15.2 psi
07A	Lab Blank	Modified ASTM D-1946	NA	NA
07B	Lab Blank	Modified ASTM D-1946	NA	NA
08A	LCS	Modified ASTM D-1946	NA	NA
08AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/14/18

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# 1811024B

Six 1 Liter Summa Canister samples were received on November 01, 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-55-5-103018

Lab ID#: 1811024B-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.23	5.1
Nitrogen	0.23	80
Methane	0.00023	0.00023
Carbon Dioxide	0.023	15

Client Sample ID: VMP-55-20-103018

Lab ID#: 1811024B-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	1.4
Nitrogen	0.26	75
Methane	0.00026	6.0
Carbon Dioxide	0.026	18
Ethane	0.0026	0.0022 J
Helium	0.13	0.0092 J

Client Sample ID: VMP-15-5-103018

Lab ID#: 1811024B-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	16
Nitrogen	0.24	80
Carbon Dioxide	0.024	3.7

Client Sample ID: VMP-15-21.5-103018

Lab ID#: 1811024B-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	3.4
Nitrogen	0.25	84
Carbon Dioxide	0.025	13

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

Client Sample ID: VMP-15-25.5-103018

Lab ID#: 1811024B-05A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	1.8
Nitrogen	0.25	83
Methane	0.00025	0.00093
Carbon Dioxide	0.025	15

Client Sample ID: VMP-15-29-103018

Lab ID#: 1811024B-06A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.23	2.8
Nitrogen	0.23	82
Carbon Dioxide	0.023	15
Helium	0.12	0.0092 J

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Client Sample ID: VMP-55-5-103018

Lab ID#: 1811024B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110636**	**Date of Collection:**	**10/30/18 10:58:00 A**
Dil. Factor:	**2.30**	**Date of Analysis:**	**11/6/18 08:51 PM**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.23	5.1
Nitrogen	0.23	80
Carbon Monoxide	0.023	Not Detected
Methane	0.00023	0.00023
Carbon Dioxide	0.023	15
Ethane	0.0023	Not Detected
Ethene	0.0023	Not Detected
Helium	0.12	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-55-20-103018

Lab ID#: 1811024B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110642**	**Date of Collection:**	**10/30/18 11:14:00 A**
Dil. Factor:	**2.57**	**Date of Analysis:**	**11/7/18 06:21 AM**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	1.4
Nitrogen	0.26	75
Carbon Monoxide	0.026	Not Detected
Methane	0.00026	6.0
Carbon Dioxide	0.026	18
Ethane	0.0026	0.0022 J
Ethene	0.0026	Not Detected
Helium	0.13	0.0092 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-5-103018

Lab ID#: 1811024B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110643**	**Date of Collection:**	**10/30/18 12:26:00 P**
Dil. Factor:	**2.41**	**Date of Analysis:**	**11/7/18 06:56 AM**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.24	16
Nitrogen	0.24	80
Carbon Monoxide	0.024	Not Detected
Methane	0.00024	Not Detected
Carbon Dioxide	0.024	3.7
Ethane	0.0024	Not Detected
Ethene	0.0024	Not Detected
Helium	0.12	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-21.5-103018

Lab ID#: 1811024B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110644**	**Date of Collection:**	**10/30/18 12:40:00 P**
Dil. Factor:	**2.46**	**Date of Analysis:**	**11/7/18 07:26 AM**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	3.4
Nitrogen	0.25	84
Carbon Monoxide	0.025	Not Detected
Methane	0.00025	Not Detected
Carbon Dioxide	0.025	13
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-15-25.5-103018

Lab ID#: 1811024B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110645**	**Date of Collection:**	**10/30/18 12:58:00 P**
Dil. Factor:	**2.46**	**Date of Analysis:**	**11/7/18 07:54 AM**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	1.8
Nitrogen	0.25	83
Carbon Monoxide	0.025	Not Detected
Methane	0.00025	0.00093
Carbon Dioxide	0.025	15
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-15-29-103018

Lab ID#: 1811024B-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110646**	**Date of Collection: 10/30/18 1:14:00 PM**	
Dil. Factor:	**2.34**	**Date of Analysis: 11/7/18 08:24 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.23	2.8
Nitrogen	0.23	82
Carbon Monoxide	0.023	Not Detected
Methane	0.00023	Not Detected
Carbon Dioxide	0.023	15
Ethane	0.0023	Not Detected
Ethene	0.0023	Not Detected
Helium	0.12	0.0092 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: Lab Blank

Lab ID#: 1811024B-07A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110626**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/18 02:29 PM**	

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

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Client Sample ID: Lab Blank

Lab ID#: 1811024B-07B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110625c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/18 02:05 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#: 1811024B-08A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110624**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/6/18 01:36 PM**	

Compound	%Recovery	Method Limits
Oxygen	103	85-115
Nitrogen	90	85-115
Carbon Monoxide	90	85-115
Methane	106	85-115
Carbon Dioxide	98	85-115
Ethane	103	85-115
Ethene	102	85-115
Helium	100	85-115

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 1811024B-08AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10110647**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/7/18 09:09 AM**	

Compound	%Recovery	Method Limits
Oxygen	104	85-115
Nitrogen	91	85-115
Carbon Monoxide	91	85-115
Methane	105	85-115
Carbon Dioxide	98	85-115
Ethane	102	85-115
Ethene	101	85-115
Helium	101	85-115

Container Type: NA - Not Applicable