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November 6, 2017

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 (314/743-4106) or Samuel Fisher at samuel.fisher@aecom.com (314/296-1969).

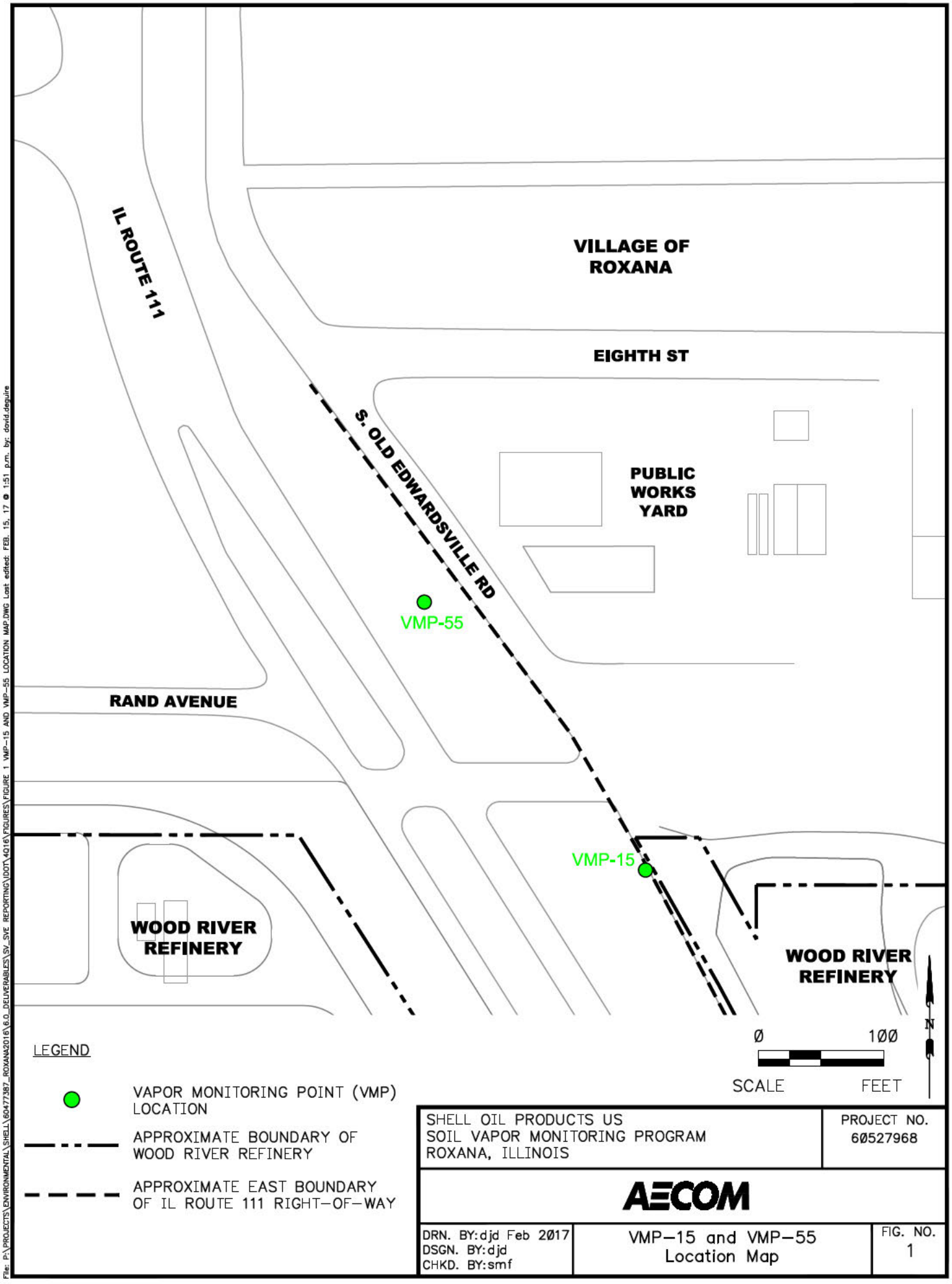
Sincerely,
AECOM, on behalf of Shell Oil Products US

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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8/28/2017

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

Project Name: Roxana Quarterly Soil Vapor
Project #: 60527968 - 1.04.003
Workorder #: 1707416AR1

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 7/27/2017 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 #: 1707416AR1

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. #**	60527968-104003
FAX:		**PROJECT #**	60527968 - 1.04.003 Roxana Quarterly Soil Vapor
DATE RECEIVED:	07/27/2017	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	08/09/2017		
DATE REISSUED:	08/28/2017		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-55-5-072617	TO-15	5.9 "Hg	14.3 psi
02A	VMP-55-20-072617	TO-15	5.7 "Hg	14.8 psi
03A	VMP-15-5-072617	TO-15	5.5 "Hg	15 psi
04A	VMP-15-21.5-072617	TO-15	6.3 "Hg	15.1 psi
05A	VMP-15-25.5-072617	TO-15	5.9 "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: 08/28/17

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# 1707416AR1

Five 1 Liter Summa Canister samples were received on July 27, 2017. 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.

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

Dilution was performed on samples VMP-55-20-072617, VMP-15-21.5-072617 and VMP-15-25.5-072617 due to the presence of high level target species.

The recovery of surrogate 1,2-Dichloroethane-d4 in sample VMP-55-20-072617 was outside laboratory control limits due to high level hydrocarbon matrix interference. The surrogate recovery is flagged.

Due to laboratory error, the workorder was reissued on 8/28/2017 to correctly report misidentified compound 1,2-Dichloroethane in sample VMP-55-20-072617 as not detected.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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

Client Sample ID: VMP-55-5-072617

Lab ID#: 1707416AR1-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	2.2	0.56 J	11	2.8 J
Ethanol	8.8	4.5 J	17	8.5 J
Acetone	22	14 J	52	34 J
2-Propanol	8.8	2.3 J	22	5.6 J
Methylene Chloride	22	2.3 J	77	7.9 J
Hexane	2.2	0.72 J	7.8	2.5 J
2-Butanone (Methyl Ethyl Ketone)	8.8	3.6 J	26	11 J
2,2,4-Trimethylpentane	2.2	5.6	10	26
Benzene	2.2	0.68 J	7.0	2.2 J
Heptane	2.2	0.63 J	9.0	2.6 J
Toluene	2.2	3.0	8.3	11
Ethyl Benzene	2.2	5.3	9.6	23
m,p-Xylene	2.2	19	9.6	83
o-Xylene	2.2	5.0	9.6	22
Cumene	2.2	0.56 J	11	2.7 J
Propylbenzene	2.2	0.55 J	11	2.7 J
4-Ethyltoluene	2.2	1.2 J	11	6.1 J
1,3,5-Trimethylbenzene	2.2	0.43 J	11	2.1 J
1,2,4-Trimethylbenzene	2.2	0.86 J	11	4.2 J

Client Sample ID: VMP-55-20-072617

Lab ID#: 1707416AR1-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Hexane	62	13000	220	45000
Cyclohexane	62	20000	210	68000
2,2,4-Trimethylpentane	62	54000	290	250000
Heptane	62	7000	250	28000
Butane	250	18000	590	42000
Isopentane	250	100000	730	310000

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

Client Sample ID: VMP-15-5-072617

Lab ID#: 1707416AR1-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.48 J	6.1	2.4 J
Freon 11	1.2	0.26 J	6.9	1.4 J
Ethanol	4.9	4.8 J	9.3	9.1 J
Acetone	12	6.6 J	29	16 J
2-Propanol	4.9	5.0	12	12
Chloroform	1.2	1.2 J	6.0	5.8 J
Benzene	1.2	0.34 J	3.9	1.1 J
Toluene	1.2	0.22 J	4.6	0.81 J

Client Sample ID: VMP-15-21.5-072617

Lab ID#: 1707416AR1-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	52	8.5 J	120	20 J
Hexane	5.2	7.6	18	27
2,2,4-Trimethylpentane	5.2	1400	24	6600
Benzene	5.2	2.4 J	16	7.6 J
Butane	21	71	49	170
Isopentane	21	44	61	130

Client Sample ID: VMP-15-25.5-072617

Lab ID#: 1707416AR1-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2,2,4-Trimethylpentane	21	4700	98	22000
Benzene	21	15 J	67	49 J
Cumene	21	1.8 J	100	8.6 J

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Client Sample ID: VMP-55-5-072617

Lab ID#: 1707416AR1-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080111**	**Date of Collection:**	**7/26/17 10:56:00 AM**
Dil. Factor:	**4.41**	**Date of Analysis:**	**8/1/17 07:04 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	2.2	0.56 J	11	2.8 J
Freon 114	2.2	Not Detected	15	Not Detected
Chloromethane	22	Not Detected	46	Not Detected
Vinyl Chloride	2.2	Not Detected	5.6	Not Detected
1,3-Butadiene	2.2	Not Detected	4.9	Not Detected
Bromomethane	22	Not Detected	86	Not Detected
Chloroethane	8.8	Not Detected	23	Not Detected
Freon 11	2.2	Not Detected	12	Not Detected
Ethanol	8.8	4.5 J	17	8.5 J
Freon 113	2.2	Not Detected	17	Not Detected
1,1-Dichloroethene	2.2	Not Detected	8.7	Not Detected
Acetone	22	14 J	52	34 J
2-Propanol	8.8	2.3 J	22	5.6 J
Carbon Disulfide	8.8	Not Detected	27	Not Detected
3-Chloropropene	8.8	Not Detected	28	Not Detected
Methylene Chloride	22	2.3 J	77	7.9 J
Methyl tert-butyl ether	8.8	Not Detected	32	Not Detected
trans-1,2-Dichloroethene	2.2	Not Detected	8.7	Not Detected
Hexane	2.2	0.72 J	7.8	2.5 J
1,1-Dichloroethane	2.2	Not Detected	8.9	Not Detected
2-Butanone (Methyl Ethyl Ketone)	8.8	3.6 J	26	11 J
cis-1,2-Dichloroethene	2.2	Not Detected	8.7	Not Detected
Tetrahydrofuran	2.2	Not Detected	6.5	Not Detected
Chloroform	2.2	Not Detected	11	Not Detected
1,1,1-Trichloroethane	2.2	Not Detected	12	Not Detected
Cyclohexane	2.2	Not Detected	7.6	Not Detected
Carbon Tetrachloride	2.2	Not Detected	14	Not Detected
2,2,4-Trimethylpentane	2.2	5.6	10	26
Benzene	2.2	0.68 J	7.0	2.2 J
1,2-Dichloroethane	2.2	Not Detected	8.9	Not Detected
Heptane	2.2	0.63 J	9.0	2.6 J
Trichloroethene	2.2	Not Detected	12	Not Detected
1,2-Dichloropropane	2.2	Not Detected	10	Not Detected
1,4-Dioxane	8.8	Not Detected	32	Not Detected
Bromodichloromethane	2.2	Not Detected	15	Not Detected
cis-1,3-Dichloropropene	2.2	Not Detected	10	Not Detected
4-Methyl-2-pentanone	2.2	Not Detected	9.0	Not Detected
Toluene	2.2	3.0	8.3	11
trans-1,3-Dichloropropene	2.2	Not Detected	10	Not Detected
1,1,2-Trichloroethane	2.2	Not Detected	12	Not Detected
Tetrachloroethene	2.2	Not Detected	15	Not Detected
2-Hexanone	8.8	Not Detected	36	Not Detected

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Client Sample ID: VMP-55-5-072617

Lab ID#: 1707416AR1-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080111**	**Date of Collection:**	**7/26/17 10:56:00 AM**
Dil. Factor:	**4.41**	**Date of Analysis:**	**8/1/17 07:04 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	2.2	Not Detected	19	Not Detected
1,2-Dibromoethane (EDB)	2.2	Not Detected	17	Not Detected
Chlorobenzene	2.2	Not Detected	10	Not Detected
Ethyl Benzene	2.2	5.3	9.6	23
m,p-Xylene	2.2	19	9.6	83
o-Xylene	2.2	5.0	9.6	22
Styrene	2.2	Not Detected	9.4	Not Detected
Bromoform	2.2	Not Detected	23	Not Detected
Cumene	2.2	0.56 J	11	2.7 J
1,1,2,2-Tetrachloroethane	2.2	Not Detected	15	Not Detected
Propylbenzene	2.2	0.55 J	11	2.7 J
4-Ethyltoluene	2.2	1.2 J	11	6.1 J
1,3,5-Trimethylbenzene	2.2	0.43 J	11	2.1 J
1,2,4-Trimethylbenzene	2.2	0.86 J	11	4.2 J
1,3-Dichlorobenzene	2.2	Not Detected	13	Not Detected
1,4-Dichlorobenzene	2.2	Not Detected	13	Not Detected
alpha-Chlorotoluene	2.2	Not Detected	11	Not Detected
1,2-Dichlorobenzene	2.2	Not Detected	13	Not Detected
1,2,4-Trichlorobenzene	8.8	Not Detected	65	Not Detected
Hexachlorobutadiene	8.8	Not Detected	94	Not Detected
Butane	8.8	Not Detected	21	Not Detected
Isopentane	8.8	Not Detected	26	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	90	70-130

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Client Sample ID: VMP-55-20-072617

Lab ID#: 1707416AR1-02A

EPA METHOD TO-15 GC/MS

File Name:	**14080318r1**	**Date of Collection:**	**7/26/17 11:17:00 AM**
Dil. Factor:	**12.4**	**Date of Analysis:**	**8/3/17 05:37 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	62	Not Detected	310	Not Detected
Freon 114	62	Not Detected	430	Not Detected
Chloromethane	250	Not Detected	510	Not Detected
Vinyl Chloride	62	Not Detected	160	Not Detected
1,3-Butadiene	62	Not Detected	140	Not Detected
Bromomethane	250	Not Detected	960	Not Detected
Chloroethane	250	Not Detected	650	Not Detected
Freon 11	62	Not Detected	350	Not Detected
Ethanol	250	Not Detected	470	Not Detected
Freon 113	62	Not Detected	480	Not Detected
1,1-Dichloroethene	62	Not Detected	240	Not Detected
Acetone	250	Not Detected	590	Not Detected
2-Propanol	250	Not Detected	610	Not Detected
Carbon Disulfide	250	Not Detected	770	Not Detected
3-Chloropropene	250	Not Detected	780	Not Detected
Methylene Chloride	250	Not Detected	860	Not Detected
Methyl tert-butyl ether	62	Not Detected	220	Not Detected
trans-1,2-Dichloroethene	62	Not Detected	240	Not Detected
Hexane	62	13000	220	45000
1,1-Dichloroethane	62	Not Detected	250	Not Detected
2-Butanone (Methyl Ethyl Ketone)	250	Not Detected	730	Not Detected
cis-1,2-Dichloroethene	62	Not Detected	240	Not Detected
Tetrahydrofuran	62	Not Detected	180	Not Detected
Chloroform	62	Not Detected	300	Not Detected
1,1,1-Trichloroethane	62	Not Detected	340	Not Detected
Cyclohexane	62	20000	210	68000
Carbon Tetrachloride	62	Not Detected	390	Not Detected
2,2,4-Trimethylpentane	62	54000	290	250000
Benzene	62	Not Detected	200	Not Detected
1,2-Dichloroethane	62	Not Detected	250	Not Detected
Heptane	62	7000	250	28000
Trichloroethene	62	Not Detected	330	Not Detected
1,2-Dichloropropane	62	Not Detected	290	Not Detected
1,4-Dioxane	250	Not Detected	890	Not Detected
Bromodichloromethane	62	Not Detected	420	Not Detected
cis-1,3-Dichloropropene	62	Not Detected	280	Not Detected
4-Methyl-2-pentanone	62	Not Detected	250	Not Detected
Toluene	62	Not Detected	230	Not Detected
trans-1,3-Dichloropropene	62	Not Detected	280	Not Detected
1,1,2-Trichloroethane	62	Not Detected	340	Not Detected
Tetrachloroethene	62	Not Detected	420	Not Detected
2-Hexanone	250	Not Detected	1000	Not Detected

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Client Sample ID: VMP-55-20-072617

Lab ID#: 1707416AR1-02A

EPA METHOD TO-15 GC/MS

File Name:	**14080318r1**	**Date of Collection:**	**7/26/17 11:17:00 AM**
Dil. Factor:	**12.4**	**Date of Analysis:**	**8/3/17 05:37 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	62	Not Detected	530	Not Detected
1,2-Dibromoethane (EDB)	62	Not Detected	480	Not Detected
Chlorobenzene	62	Not Detected	280	Not Detected
Ethyl Benzene	62	Not Detected	270	Not Detected
m,p-Xylene	62	Not Detected	270	Not Detected
o-Xylene	62	Not Detected	270	Not Detected
Styrene	62	Not Detected	260	Not Detected
Bromoform	62	Not Detected	640	Not Detected
Cumene	62	Not Detected	300	Not Detected
1,1,2,2-Tetrachloroethane	62	Not Detected	420	Not Detected
Propylbenzene	62	Not Detected	300	Not Detected
4-Ethyltoluene	62	Not Detected	300	Not Detected
1,3,5-Trimethylbenzene	62	Not Detected	300	Not Detected
1,2,4-Trimethylbenzene	62	Not Detected	300	Not Detected
1,3-Dichlorobenzene	62	Not Detected	370	Not Detected
1,4-Dichlorobenzene	62	Not Detected	370	Not Detected
alpha-Chlorotoluene	62	Not Detected	320	Not Detected
1,2-Dichlorobenzene	62	Not Detected	370	Not Detected
1,2,4-Trichlorobenzene	250	Not Detected	1800	Not Detected
Hexachlorobutadiene	250	Not Detected	2600	Not Detected
Butane	250	18000	590	42000
Isopentane	250	100000	730	310000

Q = Exceeds Quality Control limits.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	132 Q	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: VMP-15-5-072617

Lab ID#: 1707416AR1-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080112**	**Date of Collection:**	**7/26/17 12:15:00 PM**
Dil. Factor:	**2.47**	**Date of Analysis:**	**8/1/17 07:32 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.2	0.48 J	6.1	2.4 J
Freon 114	1.2	Not Detected	8.6	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	2.7	Not Detected
Bromomethane	12	Not Detected	48	Not Detected
Chloroethane	4.9	Not Detected	13	Not Detected
Freon 11	1.2	0.26 J	6.9	1.4 J
Ethanol	4.9	4.8 J	9.3	9.1 J
Freon 113	1.2	Not Detected	9.5	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Acetone	12	6.6 J	29	16 J
2-Propanol	4.9	5.0	12	12
Carbon Disulfide	4.9	Not Detected	15	Not Detected
3-Chloropropene	4.9	Not Detected	15	Not Detected
Methylene Chloride	12	Not Detected	43	Not Detected
Methyl tert-butyl ether	4.9	Not Detected	18	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Hexane	1.2	Not Detected	4.4	Not Detected
1,1-Dichloroethane	1.2	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	1.2 J	6.0	5.8 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	7.8	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.8	Not Detected
Benzene	1.2	0.34 J	3.9	1.1 J
1,2-Dichloroethane	1.2	Not Detected	5.0	Not Detected
Heptane	1.2	Not Detected	5.1	Not Detected
Trichloroethene	1.2	Not Detected	6.6	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.7	Not Detected
1,4-Dioxane	4.9	Not Detected	18	Not Detected
Bromodichloromethane	1.2	Not Detected	8.3	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
4-Methyl-2-pentanone	1.2	Not Detected	5.0	Not Detected
Toluene	1.2	0.22 J	4.6	0.81 J
trans-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.7	Not Detected
Tetrachloroethene	1.2	Not Detected	8.4	Not Detected
2-Hexanone	4.9	Not Detected	20	Not Detected

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Client Sample ID: VMP-15-5-072617

Lab ID#: 1707416AR1-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080112**	**Date of Collection: 7/26/17 12:15:00 PM**	
Dil. Factor:	**2.47**	**Date of Analysis: 8/1/17 07:32 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	9.5	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	7.4	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	37	Not Detected
Hexachlorobutadiene	4.9	Not Detected	53	Not Detected
Butane	4.9	Not Detected	12	Not Detected
Isopentane	4.9	Not Detected	14	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: VMP-15-21.5-072617

Lab ID#: 1707416AR1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080113**	**Date of Collection:**	**7/26/17 12:39:00 PM**
Dil. Factor:	**10.3**	**Date of Analysis:**	**8/1/17 07:59 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	5.2	Not Detected	25	Not Detected
Freon 114	5.2	Not Detected	36	Not Detected
Chloromethane	52	Not Detected	110	Not Detected
Vinyl Chloride	5.2	Not Detected	13	Not Detected
1,3-Butadiene	5.2	Not Detected	11	Not Detected
Bromomethane	52	Not Detected	200	Not Detected
Chloroethane	21	Not Detected	54	Not Detected
Freon 11	5.2	Not Detected	29	Not Detected
Ethanol	21	Not Detected	39	Not Detected
Freon 113	5.2	Not Detected	39	Not Detected
1,1-Dichloroethene	5.2	Not Detected	20	Not Detected
Acetone	52	8.5 J	120	20 J
2-Propanol	21	Not Detected	51	Not Detected
Carbon Disulfide	21	Not Detected	64	Not Detected
3-Chloropropene	21	Not Detected	64	Not Detected
Methylene Chloride	52	Not Detected	180	Not Detected
Methyl tert-butyl ether	21	Not Detected	74	Not Detected
trans-1,2-Dichloroethene	5.2	Not Detected	20	Not Detected
Hexane	5.2	7.6	18	27
1,1-Dichloroethane	5.2	Not Detected	21	Not Detected
2-Butanone (Methyl Ethyl Ketone)	21	Not Detected	61	Not Detected
cis-1,2-Dichloroethene	5.2	Not Detected	20	Not Detected
Tetrahydrofuran	5.2	Not Detected	15	Not Detected
Chloroform	5.2	Not Detected	25	Not Detected
1,1,1-Trichloroethane	5.2	Not Detected	28	Not Detected
Cyclohexane	5.2	Not Detected	18	Not Detected
Carbon Tetrachloride	5.2	Not Detected	32	Not Detected
2,2,4-Trimethylpentane	5.2	1400	24	6600
Benzene	5.2	2.4 J	16	7.6 J
1,2-Dichloroethane	5.2	Not Detected	21	Not Detected
Heptane	5.2	Not Detected	21	Not Detected
Trichloroethene	5.2	Not Detected	28	Not Detected
1,2-Dichloropropane	5.2	Not Detected	24	Not Detected
1,4-Dioxane	21	Not Detected	74	Not Detected
Bromodichloromethane	5.2	Not Detected	34	Not Detected
cis-1,3-Dichloropropene	5.2	Not Detected	23	Not Detected
4-Methyl-2-pentanone	5.2	Not Detected	21	Not Detected
Toluene	5.2	Not Detected	19	Not Detected
trans-1,3-Dichloropropene	5.2	Not Detected	23	Not Detected
1,1,2-Trichloroethane	5.2	Not Detected	28	Not Detected
Tetrachloroethene	5.2	Not Detected	35	Not Detected
2-Hexanone	21	Not Detected	84	Not Detected

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Client Sample ID: VMP-15-21.5-072617

Lab ID#: 1707416AR1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080113**	**Date of Collection: 7/26/17 12:39:00 PM**	
Dil. Factor:	**10.3**	**Date of Analysis: 8/1/17 07:59 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	5.2	Not Detected	44	Not Detected
1,2-Dibromoethane (EDB)	5.2	Not Detected	40	Not Detected
Chlorobenzene	5.2	Not Detected	24	Not Detected
Ethyl Benzene	5.2	Not Detected	22	Not Detected
m,p-Xylene	5.2	Not Detected	22	Not Detected
o-Xylene	5.2	Not Detected	22	Not Detected
Styrene	5.2	Not Detected	22	Not Detected
Bromoform	5.2	Not Detected	53	Not Detected
Cumene	5.2	Not Detected	25	Not Detected
1,1,2,2-Tetrachloroethane	5.2	Not Detected	35	Not Detected
Propylbenzene	5.2	Not Detected	25	Not Detected
4-Ethyltoluene	5.2	Not Detected	25	Not Detected
1,3,5-Trimethylbenzene	5.2	Not Detected	25	Not Detected
1,2,4-Trimethylbenzene	5.2	Not Detected	25	Not Detected
1,3-Dichlorobenzene	5.2	Not Detected	31	Not Detected
1,4-Dichlorobenzene	5.2	Not Detected	31	Not Detected
alpha-Chlorotoluene	5.2	Not Detected	27	Not Detected
1,2-Dichlorobenzene	5.2	Not Detected	31	Not Detected
1,2,4-Trichlorobenzene	21	Not Detected	150	Not Detected
Hexachlorobutadiene	21	Not Detected	220	Not Detected
Butane	21	71	49	170
Isopentane	21	44	61	130

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	91	70-130

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Client Sample ID: VMP-15-25.5-072617

Lab ID#: 1707416AR1-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080114**	**Date of Collection:**	**7/26/17 1:05:00 PM**
Dil. Factor:	**41.9**	**Date of Analysis:**	**8/1/17 08:26 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	21	Not Detected	100	Not Detected
Freon 114	21	Not Detected	150	Not Detected
Chloromethane	210	Not Detected	430	Not Detected
Vinyl Chloride	21	Not Detected	54	Not Detected
1,3-Butadiene	21	Not Detected	46	Not Detected
Bromomethane	210	Not Detected	810	Not Detected
Chloroethane	84	Not Detected	220	Not Detected
Freon 11	21	Not Detected	120	Not Detected
Ethanol	84	Not Detected	160	Not Detected
Freon 113	21	Not Detected	160	Not Detected
1,1-Dichloroethene	21	Not Detected	83	Not Detected
Acetone	210	Not Detected	500	Not Detected
2-Propanol	84	Not Detected	200	Not Detected
Carbon Disulfide	84	Not Detected	260	Not Detected
3-Chloropropene	84	Not Detected	260	Not Detected
Methylene Chloride	210	Not Detected	730	Not Detected
Methyl tert-butyl ether	84	Not Detected	300	Not Detected
trans-1,2-Dichloroethene	21	Not Detected	83	Not Detected
Hexane	21	Not Detected	74	Not Detected
1,1-Dichloroethane	21	Not Detected	85	Not Detected
2-Butanone (Methyl Ethyl Ketone)	84	Not Detected	250	Not Detected
cis-1,2-Dichloroethene	21	Not Detected	83	Not Detected
Tetrahydrofuran	21	Not Detected	62	Not Detected
Chloroform	21	Not Detected	100	Not Detected
1,1,1-Trichloroethane	21	Not Detected	110	Not Detected
Cyclohexane	21	Not Detected	72	Not Detected
Carbon Tetrachloride	21	Not Detected	130	Not Detected
2,2,4-Trimethylpentane	21	4700	98	22000
Benzene	21	15 J	67	49 J
1,2-Dichloroethane	21	Not Detected	85	Not Detected
Heptane	21	Not Detected	86	Not Detected
Trichloroethene	21	Not Detected	110	Not Detected
1,2-Dichloropropane	21	Not Detected	97	Not Detected
1,4-Dioxane	84	Not Detected	300	Not Detected
Bromodichloromethane	21	Not Detected	140	Not Detected
cis-1,3-Dichloropropene	21	Not Detected	95	Not Detected
4-Methyl-2-pentanone	21	Not Detected	86	Not Detected
Toluene	21	Not Detected	79	Not Detected
trans-1,3-Dichloropropene	21	Not Detected	95	Not Detected
1,1,2-Trichloroethane	21	Not Detected	110	Not Detected
Tetrachloroethene	21	Not Detected	140	Not Detected
2-Hexanone	84	Not Detected	340	Not Detected

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Client Sample ID: VMP-15-25.5-072617

Lab ID#: 1707416AR1-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080114**	**Date of Collection: 7/26/17 1:05:00 PM**	
Dil. Factor:	**41.9**	**Date of Analysis: 8/1/17 08:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	21	Not Detected	180	Not Detected
1,2-Dibromoethane (EDB)	21	Not Detected	160	Not Detected
Chlorobenzene	21	Not Detected	96	Not Detected
Ethyl Benzene	21	Not Detected	91	Not Detected
m,p-Xylene	21	Not Detected	91	Not Detected
o-Xylene	21	Not Detected	91	Not Detected
Styrene	21	Not Detected	89	Not Detected
Bromoform	21	Not Detected	220	Not Detected
Cumene	21	1.8 J	100	8.6 J
1,1,2,2-Tetrachloroethane	21	Not Detected	140	Not Detected
Propylbenzene	21	Not Detected	100	Not Detected
4-Ethyltoluene	21	Not Detected	100	Not Detected
1,3,5-Trimethylbenzene	21	Not Detected	100	Not Detected
1,2,4-Trimethylbenzene	21	Not Detected	100	Not Detected
1,3-Dichlorobenzene	21	Not Detected	120	Not Detected
1,4-Dichlorobenzene	21	Not Detected	120	Not Detected
alpha-Chlorotoluene	21	Not Detected	110	Not Detected
1,2-Dichlorobenzene	21	Not Detected	120	Not Detected
1,2,4-Trichlorobenzene	84	Not Detected	620	Not Detected
Hexachlorobutadiene	84	Not Detected	890	Not Detected
Butane	84	Not Detected	200	Not Detected
Isopentane	84	Not Detected	250	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1707416AR1-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080105a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/1/17 01:51 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	0.75 J	12	1.8 J
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	0.073 J	1.6	0.23 J
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#: 1707416AR1-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080105a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/1/17 01:51 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	0.053 J	2.3	0.25 J
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	0.061 J	15	0.45 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	100	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	90	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1707416AR1-06B

EPA METHOD TO-15 GC/MS

File Name:	**14080313c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/3/17 03:17 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	5.0	Not Detected	25	Not Detected
Freon 114	5.0	Not Detected	35	Not Detected
Chloromethane	20	Not Detected	41	Not Detected
Vinyl Chloride	5.0	Not Detected	13	Not Detected
1,3-Butadiene	5.0	Not Detected	11	Not Detected
Bromomethane	20	Not Detected	78	Not Detected
Chloroethane	20	Not Detected	53	Not Detected
Freon 11	5.0	Not Detected	28	Not Detected
Ethanol	20	Not Detected	38	Not Detected
Freon 113	5.0	Not Detected	38	Not Detected
1,1-Dichloroethene	5.0	Not Detected	20	Not Detected
Acetone	20	Not Detected	48	Not Detected
2-Propanol	20	Not Detected	49	Not Detected
Carbon Disulfide	20	Not Detected	62	Not Detected
3-Chloropropene	20	Not Detected	63	Not Detected
Methylene Chloride	20	Not Detected	69	Not Detected
Methyl tert-butyl ether	5.0	Not Detected	18	Not Detected
trans-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Hexane	5.0	Not Detected	18	Not Detected
1,1-Dichloroethane	5.0	Not Detected	20	Not Detected
2-Butanone (Methyl Ethyl Ketone)	20	Not Detected	59	Not Detected
cis-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Tetrahydrofuran	5.0	Not Detected	15	Not Detected
Chloroform	5.0	Not Detected	24	Not Detected
1,1,1-Trichloroethane	5.0	Not Detected	27	Not Detected
Cyclohexane	5.0	Not Detected	17	Not Detected
Carbon Tetrachloride	5.0	Not Detected	31	Not Detected
2,2,4-Trimethylpentane	5.0	Not Detected	23	Not Detected
Benzene	5.0	Not Detected	16	Not Detected
1,2-Dichloroethane	5.0	Not Detected	20	Not Detected
Heptane	5.0	Not Detected	20	Not Detected
Trichloroethene	5.0	Not Detected	27	Not Detected
1,2-Dichloropropane	5.0	Not Detected	23	Not Detected
1,4-Dioxane	20	Not Detected	72	Not Detected
Bromodichloromethane	5.0	Not Detected	34	Not Detected
cis-1,3-Dichloropropene	5.0	Not Detected	23	Not Detected
4-Methyl-2-pentanone	5.0	Not Detected	20	Not Detected
Toluene	5.0	Not Detected	19	Not Detected
trans-1,3-Dichloropropene	5.0	Not Detected	23	Not Detected
1,1,2-Trichloroethane	5.0	Not Detected	27	Not Detected
Tetrachloroethene	5.0	Not Detected	34	Not Detected
2-Hexanone	20	Not Detected	82	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 1707416AR1-06B

EPA METHOD TO-15 GC/MS

File Name:	**14080313c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/3/17 03:17 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	5.0	Not Detected	42	Not Detected
1,2-Dibromoethane (EDB)	5.0	Not Detected	38	Not Detected
Chlorobenzene	5.0	Not Detected	23	Not Detected
Ethyl Benzene	5.0	Not Detected	22	Not Detected
m,p-Xylene	5.0	Not Detected	22	Not Detected
o-Xylene	5.0	Not Detected	22	Not Detected
Styrene	5.0	Not Detected	21	Not Detected
Bromoform	5.0	Not Detected	52	Not Detected
Cumene	5.0	Not Detected	24	Not Detected
1,1,2,2-Tetrachloroethane	5.0	Not Detected	34	Not Detected
Propylbenzene	5.0	Not Detected	24	Not Detected
4-Ethyltoluene	5.0	Not Detected	24	Not Detected
1,3,5-Trimethylbenzene	5.0	Not Detected	24	Not Detected
1,2,4-Trimethylbenzene	5.0	Not Detected	24	Not Detected
1,3-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,4-Dichlorobenzene	5.0	Not Detected	30	Not Detected
alpha-Chlorotoluene	5.0	Not Detected	26	Not Detected
1,2-Dichlorobenzene	5.0	Not Detected	30	Not Detected
1,2,4-Trichlorobenzene	20	Not Detected	150	Not Detected
Hexachlorobutadiene	20	Not Detected	210	Not Detected
Butane	20	Not Detected	48	Not Detected
Isopentane	20	5.7 J	59	17 J

J = Estimated value.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: CCV

Lab ID#: 1707416AR1-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/1/17 11:57 AM**	

Compound	%Recovery
Freon 12	105
Freon 114	105
Chloromethane	101
Vinyl Chloride	105
1,3-Butadiene	107
Bromomethane	107
Chloroethane	101
Freon 11	104
Ethanol	96
Freon 113	101
1,1-Dichloroethene	102
Acetone	88
2-Propanol	101
Carbon Disulfide	104
3-Chloropropene	104
Methylene Chloride	103
Methyl tert-butyl ether	102
trans-1,2-Dichloroethene	108
Hexane	103
1,1-Dichloroethane	107
2-Butanone (Methyl Ethyl Ketone)	103
cis-1,2-Dichloroethene	110
Tetrahydrofuran	99
Chloroform	107
1,1,1-Trichloroethane	104
Cyclohexane	105
Carbon Tetrachloride	103
2,2,4-Trimethylpentane	108
Benzene	103
1,2-Dichloroethane	106
Heptane	105
Trichloroethene	103
1,2-Dichloropropane	106
1,4-Dioxane	104
Bromodichloromethane	107
cis-1,3-Dichloropropene	105
4-Methyl-2-pentanone	96
Toluene	102
trans-1,3-Dichloropropene	108
1,1,2-Trichloroethane	104
Tetrachloroethene	99
2-Hexanone	100

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Client Sample ID: CCV

Lab ID#: 1707416AR1-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/1/17 11:57 AM**	

Compound	%Recovery
Dibromochloromethane	105
1,2-Dibromoethane (EDB)	106
Chlorobenzene	101
Ethyl Benzene	104
m,p-Xylene	104
o-Xylene	105
Styrene	119
Bromoform	104
Cumene	104
1,1,2,2-Tetrachloroethane	105
Propylbenzene	102
4-Ethyltoluene	106
1,3,5-Trimethylbenzene	108
1,2,4-Trimethylbenzene	104
1,3-Dichlorobenzene	101
1,4-Dichlorobenzene	100
alpha-Chlorotoluene	96
1,2-Dichlorobenzene	101
1,2,4-Trichlorobenzene	95
Hexachlorobutadiene	91
Butane	103
Isopentane	99

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: CCV

Lab ID#: 1707416AR1-07B

EPA METHOD TO-15 GC/MS

File Name:	**14080306**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 8/3/17 11:14 AM**

Compound	%Recovery
Freon 12	109
Freon 114	105
Chloromethane	85
Vinyl Chloride	104
1,3-Butadiene	94
Bromomethane	108
Chloroethane	106
Freon 11	115
Ethanol	112
Freon 113	114
1,1-Dichloroethene	110
Acetone	118
2-Propanol	114
Carbon Disulfide	105
3-Chloropropene	94
Methylene Chloride	105
Methyl tert-butyl ether	110
trans-1,2-Dichloroethene	107
Hexane	106
1,1-Dichloroethane	111
2-Butanone (Methyl Ethyl Ketone)	110
cis-1,2-Dichloroethene	107
Tetrahydrofuran	110
Chloroform	112
1,1,1-Trichloroethane	114
Cyclohexane	106
Carbon Tetrachloride	113
2,2,4-Trimethylpentane	110
Benzene	105
1,2-Dichloroethane	105
Heptane	111
Trichloroethene	103
1,2-Dichloropropane	100
1,4-Dioxane	98
Bromodichloromethane	113
cis-1,3-Dichloropropene	110
4-Methyl-2-pentanone	129
Toluene	105
trans-1,3-Dichloropropene	115
1,1,2-Trichloroethane	104
Tetrachloroethene	114
2-Hexanone	115

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Client Sample ID: CCV
Lab ID#: 1707416AR1-07B
EPA METHOD TO-15 GC/MS

File Name:	**14080306**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/3/17 11:14 AM**	

Compound	%Recovery
Dibromochloromethane	110
1,2-Dibromoethane (EDB)	111
Chlorobenzene	110
Ethyl Benzene	110
m,p-Xylene	107
o-Xylene	109
Styrene	117
Bromoform	118
Cumene	120
1,1,2,2-Tetrachloroethane	109
Propylbenzene	116
4-Ethyltoluene	119
1,3,5-Trimethylbenzene	112
1,2,4-Trimethylbenzene	108
1,3-Dichlorobenzene	117
1,4-Dichlorobenzene	116
alpha-Chlorotoluene	125
1,2-Dichlorobenzene	117
1,2,4-Trichlorobenzene	114
Hexachlorobutadiene	134 Q
Butane	109
Isopentane	106

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	110	70-130

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Client Sample ID: LCS

Lab ID#: 1707416AR1-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/1/17 12:24 PM**	

Compound	%Recovery	Method Limits
Freon 12	108	70-130
Freon 114	111	70-130
Chloromethane	103	70-130
Vinyl Chloride	106	70-130
1,3-Butadiene	103	70-130
Bromomethane	107	70-130
Chloroethane	104	70-130
Freon 11	107	70-130
Ethanol	103	70-130
Freon 113	100	70-130
1,1-Dichloroethene	104	70-130
Acetone	89	70-130
2-Propanol	106	70-130
Carbon Disulfide	91	70-130
3-Chloropropene	98	70-130
Methylene Chloride	103	70-130
Methyl tert-butyl ether	102	70-130
trans-1,2-Dichloroethene	93	70-130
Hexane	103	70-130
1,1-Dichloroethane	106	70-130
2-Butanone (Methyl Ethyl Ketone)	99	70-130
cis-1,2-Dichloroethene	120	70-130
Tetrahydrofuran	98	70-130
Chloroform	106	70-130
1,1,1-Trichloroethane	104	70-130
Cyclohexane	105	70-130
Carbon Tetrachloride	102	70-130
2,2,4-Trimethylpentane	110	70-130
Benzene	103	70-130
1,2-Dichloroethane	105	70-130
Heptane	105	70-130
Trichloroethene	103	70-130
1,2-Dichloropropane	105	70-130
1,4-Dioxane	100	70-130
Bromodichloromethane	106	70-130
cis-1,3-Dichloropropene	97	70-130
4-Methyl-2-pentanone	97	70-130
Toluene	101	70-130
trans-1,3-Dichloropropene	106	70-130
1,1,2-Trichloroethane	105	70-130
Tetrachloroethene	100	70-130
2-Hexanone	102	70-130

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Client Sample ID: LCS

Lab ID#: 1707416AR1-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/1/17 12:24 PM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	104	70-130
1,2-Dibromoethane (EDB)	105	70-130
Chlorobenzene	101	70-130
Ethyl Benzene	104	70-130
m,p-Xylene	103	70-130
o-Xylene	106	70-130
Styrene	115	70-130
Bromoform	106	70-130
Cumene	104	70-130
1,1,2,2-Tetrachloroethane	105	70-130
Propylbenzene	103	70-130
4-Ethyltoluene	106	70-130
1,3,5-Trimethylbenzene	107	70-130
1,2,4-Trimethylbenzene	104	70-130
1,3-Dichlorobenzene	101	70-130
1,4-Dichlorobenzene	100	70-130
alpha-Chlorotoluene	111	70-130
1,2-Dichlorobenzene	102	70-130
1,2,4-Trichlorobenzene	100	70-130
Hexachlorobutadiene	96	70-130
Butane	104	60-140
Isopentane	101	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: LCSD

Lab ID#: 1707416AR1-08AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/1/17 12:51 PM**	

Compound	%Recovery	Method Limits
Freon 12	108	70-130
Freon 114	110	70-130
Chloromethane	103	70-130
Vinyl Chloride	106	70-130
1,3-Butadiene	100	70-130
Bromomethane	108	70-130
Chloroethane	106	70-130
Freon 11	107	70-130
Ethanol	101	70-130
Freon 113	99	70-130
1,1-Dichloroethene	102	70-130
Acetone	89	70-130
2-Propanol	105	70-130
Carbon Disulfide	91	70-130
3-Chloropropene	97	70-130
Methylene Chloride	103	70-130
Methyl tert-butyl ether	102	70-130
trans-1,2-Dichloroethene	93	70-130
Hexane	102	70-130
1,1-Dichloroethane	106	70-130
2-Butanone (Methyl Ethyl Ketone)	100	70-130
cis-1,2-Dichloroethene	118	70-130
Tetrahydrofuran	99	70-130
Chloroform	104	70-130
1,1,1-Trichloroethane	103	70-130
Cyclohexane	104	70-130
Carbon Tetrachloride	101	70-130
2,2,4-Trimethylpentane	110	70-130
Benzene	104	70-130
1,2-Dichloroethane	106	70-130
Heptane	104	70-130
Trichloroethene	104	70-130
1,2-Dichloropropane	106	70-130
1,4-Dioxane	98	70-130
Bromodichloromethane	107	70-130
cis-1,3-Dichloropropene	98	70-130
4-Methyl-2-pentanone	99	70-130
Toluene	101	70-130
trans-1,3-Dichloropropene	106	70-130
1,1,2-Trichloroethane	104	70-130
Tetrachloroethene	99	70-130
2-Hexanone	102	70-130

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Client Sample ID: LCSD

Lab ID#: 1707416AR1-08AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17080104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/1/17 12:51 PM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	104	70-130
1,2-Dibromoethane (EDB)	105	70-130
Chlorobenzene	100	70-130
Ethyl Benzene	102	70-130
m,p-Xylene	102	70-130
o-Xylene	106	70-130
Styrene	116	70-130
Bromoform	105	70-130
Cumene	104	70-130
1,1,2,2-Tetrachloroethane	104	70-130
Propylbenzene	103	70-130
4-Ethyltoluene	105	70-130
1,3,5-Trimethylbenzene	107	70-130
1,2,4-Trimethylbenzene	104	70-130
1,3-Dichlorobenzene	102	70-130
1,4-Dichlorobenzene	102	70-130
alpha-Chlorotoluene	112	70-130
1,2-Dichlorobenzene	103	70-130
1,2,4-Trichlorobenzene	102	70-130
Hexachlorobutadiene	99	70-130
Butane	106	60-140
Isopentane	100	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: LCS

Lab ID#: 1707416AR1-08B

EPA METHOD TO-15 GC/MS

File Name:	**14080307**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/3/17 11:50 AM**	

Compound	%Recovery	Method Limits
Freon 12	95	70-130
Freon 114	98	70-130
Chloromethane	81	70-130
Vinyl Chloride	89	70-130
1,3-Butadiene	86	70-130
Bromomethane	94	70-130
Chloroethane	94	70-130
Freon 11	106	70-130
Ethanol	97	70-130
Freon 113	100	70-130
1,1-Dichloroethene	96	70-130
Acetone	99	70-130
2-Propanol	99	70-130
Carbon Disulfide	82	70-130
3-Chloropropene	82	70-130
Methylene Chloride	95	70-130
Methyl tert-butyl ether	99	70-130
trans-1,2-Dichloroethene	83	70-130
Hexane	94	70-130
1,1-Dichloroethane	98	70-130
2-Butanone (Methyl Ethyl Ketone)	99	70-130
cis-1,2-Dichloroethene	107	70-130
Tetrahydrofuran	96	70-130
Chloroform	98	70-130
1,1,1-Trichloroethane	100	70-130
Cyclohexane	95	70-130
Carbon Tetrachloride	98	70-130
2,2,4-Trimethylpentane	94	70-130
Benzene	96	70-130
1,2-Dichloroethane	100	70-130
Heptane	98	70-130
Trichloroethene	100	70-130
1,2-Dichloropropane	91	70-130
1,4-Dioxane	69 Q	70-130
Bromodichloromethane	102	70-130
cis-1,3-Dichloropropene	96	70-130
4-Methyl-2-pentanone	117	70-130
Toluene	95	70-130
trans-1,3-Dichloropropene	103	70-130
1,1,2-Trichloroethane	97	70-130
Tetrachloroethene	101	70-130
2-Hexanone	93	70-130

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Client Sample ID: LCS

Lab ID#: 1707416AR1-08B

EPA METHOD TO-15 GC/MS

File Name:	**14080307**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/3/17 11:50 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	101	70-130
1,2-Dibromoethane (EDB)	98	70-130
Chlorobenzene	94	70-130
Ethyl Benzene	98	70-130
m,p-Xylene	98	70-130
o-Xylene	100	70-130
Styrene	100	70-130
Bromoform	107	70-130
Cumene	109	70-130
1,1,2,2-Tetrachloroethane	96	70-130
Propylbenzene	107	70-130
4-Ethyltoluene	103	70-130
1,3,5-Trimethylbenzene	104	70-130
1,2,4-Trimethylbenzene	97	70-130
1,3-Dichlorobenzene	108	70-130
1,4-Dichlorobenzene	108	70-130
alpha-Chlorotoluene	116	70-130
1,2-Dichlorobenzene	115	70-130
1,2,4-Trichlorobenzene	114	70-130
Hexachlorobutadiene	126	70-130
Butane	101	60-140
Isopentane	96	60-140

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	110	70-130

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Client Sample ID: LCSD
Lab ID#: 1707416AR1-08BB
EPA METHOD TO-15 GC/MS

File Name:	**14080308**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/3/17 12:12 PM**	

Compound	%Recovery	Method Limits
Freon 12	101	70-130
Freon 114	100	70-130
Chloromethane	80	70-130
Vinyl Chloride	94	70-130
1,3-Butadiene	89	70-130
Bromomethane	102	70-130
Chloroethane	99	70-130
Freon 11	109	70-130
Ethanol	110	70-130
Freon 113	101	70-130
1,1-Dichloroethene	100	70-130
Acetone	108	70-130
2-Propanol	98	70-130
Carbon Disulfide	84	70-130
3-Chloropropene	90	70-130
Methylene Chloride	96	70-130
Methyl tert-butyl ether	101	70-130
trans-1,2-Dichloroethene	86	70-130
Hexane	101	70-130
1,1-Dichloroethane	98	70-130
2-Butanone (Methyl Ethyl Ketone)	99	70-130
cis-1,2-Dichloroethene	110	70-130
Tetrahydrofuran	96	70-130
Chloroform	102	70-130
1,1,1-Trichloroethane	104	70-130
Cyclohexane	95	70-130
Carbon Tetrachloride	99	70-130
2,2,4-Trimethylpentane	98	70-130
Benzene	92	70-130
1,2-Dichloroethane	93	70-130
Heptane	96	70-130
Trichloroethene	99	70-130
1,2-Dichloropropane	88	70-130
1,4-Dioxane	78	70-130
Bromodichloromethane	100	70-130
cis-1,3-Dichloropropene	93	70-130
4-Methyl-2-pentanone	114	70-130
Toluene	92	70-130
trans-1,3-Dichloropropene	100	70-130
1,1,2-Trichloroethane	94	70-130
Tetrachloroethene	101	70-130
2-Hexanone	91	70-130

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Client Sample ID: LCSD
Lab ID#: 1707416AR1-08BB
EPA METHOD TO-15 GC/MS

File Name:	**14080308**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/3/17 12:12 PM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	99	70-130
1,2-Dibromoethane (EDB)	97	70-130
Chlorobenzene	94	70-130
Ethyl Benzene	99	70-130
m,p-Xylene	98	70-130
o-Xylene	98	70-130
Styrene	101	70-130
Bromoform	108	70-130
Cumene	108	70-130
1,1,2,2-Tetrachloroethane	93	70-130
Propylbenzene	105	70-130
4-Ethyltoluene	106	70-130
1,3,5-Trimethylbenzene	102	70-130
1,2,4-Trimethylbenzene	95	70-130
1,3-Dichlorobenzene	111	70-130
1,4-Dichlorobenzene	107	70-130
alpha-Chlorotoluene	117	70-130
1,2-Dichlorobenzene	110	70-130
1,2,4-Trichlorobenzene	119	70-130
Hexachlorobutadiene	132 Q	70-130
Butane	92	60-140
Isopentane	98	60-140

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	104	70-130

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8/9/2017

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

Project Name: Roxana Quarterly Soil Vapor
Project #: 60527968 - 1.04.003
Workorder #: 1707416B

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 7/27/2017 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 #: 1707416B

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. #**	60527968-104003
FAX:		**PROJECT #**	60527968 - 1.04.003 Roxana Quarterly Soil Vapor
DATE RECEIVED:	07/27/2017	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	08/09/2017		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-55-5-072617	Modified ASTM D-1946	5.9 "Hg	14.3 psi
02A	VMP-55-20-072617	Modified ASTM D-1946	5.7 "Hg	14.8 psi
03A	VMP-15-5-072617	Modified ASTM D-1946	5.5 "Hg	15 psi
04A	VMP-15-21.5-072617	Modified ASTM D-1946	6.3 "Hg	15.1 psi
05A	VMP-15-25.5-072617	Modified ASTM D-1946	5.9 "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: 08/09/17

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# 1707416B

Five 1 Liter Summa Canister samples were received on July 27, 2017. 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-55-5-072617

Lab ID#: 1707416B-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	4.1
Nitrogen	0.25	80
Methane	0.00025	0.00025
Carbon Dioxide	0.025	16

Client Sample ID: VMP-55-20-072617

Lab ID#: 1707416B-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	2.0
Nitrogen	0.25	76
Methane	0.00025	4.1
Carbon Dioxide	0.025	18
Ethane	0.0025	0.00090 J
Helium	0.12	0.012 J

Client Sample ID: VMP-15-5-072617

Lab ID#: 1707416B-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	13
Nitrogen	0.25	81
Carbon Dioxide	0.025	6.0

Client Sample ID: VMP-15-21.5-072617

Lab ID#: 1707416B-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	1.3
Nitrogen	0.26	76
Methane	0.00026	7.2
Carbon Dioxide	0.026	15

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

Client Sample ID: VMP-15-21.5-072617

Lab ID#: 1707416B-04A

Ethane	0.0026	0.00052 J

Client Sample ID: VMP-15-25.5-072617

Lab ID#: 1707416B-05A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	1.5
Nitrogen	0.25	76
Methane	0.00025	6.7
Carbon Dioxide	0.025	16
Ethane	0.0025	0.0025 J

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Client Sample ID: VMP-55-5-072617

Lab ID#: 1707416B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10072840**	**Date of Collection: 7/26/17 10:56:00 AM**	
Dil. Factor:	**2.46**	**Date of Analysis: 7/28/17 09:44 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	4.1
Nitrogen	0.25	80
Carbon Monoxide	0.025	Not Detected
Methane	0.00025	0.00025
Carbon Dioxide	0.025	16
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-55-20-072617

Lab ID#: 1707416B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10072841**	**Date of Collection:**	**7/26/17 11:17:00 AM**
Dil. Factor:	**2.48**	**Date of Analysis:**	**7/28/17 10:06 PM**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	2.0
Nitrogen	0.25	76
Carbon Monoxide	0.025	Not Detected
Methane	0.00025	4.1
Carbon Dioxide	0.025	18
Ethane	0.0025	0.00090 J
Ethene	0.0025	Not Detected
Helium	0.12	0.012 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

eurofins | Air Toxics

Client Sample ID: VMP-15-5-072617

Lab ID#: 1707416B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10072842**	**Date of Collection: 7/26/17 12:15:00 PM**	
Dil. Factor:	**2.48**	**Date of Analysis: 7/29/17 07:13 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	13
Nitrogen	0.25	81
Carbon Monoxide	0.025	Not Detected
Methane	0.00025	Not Detected
Carbon Dioxide	0.025	6.0
Ethane	0.0025	Not Detected
Ethene	0.0025	Not Detected
Helium	0.12	Not Detected

Container Type: 1 Liter Summa Canister

eurofins | Air Toxics

Client Sample ID: VMP-15-21.5-072617

Lab ID#: 1707416B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10072843**	**Date of Collection: 7/26/17 12:39:00 PM**	
Dil. Factor:	**2.57**	**Date of Analysis: 7/29/17 07:38 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	1.3
Nitrogen	0.26	76
Carbon Monoxide	0.026	Not Detected
Methane	0.00026	7.2
Carbon Dioxide	0.026	15
Ethane	0.0026	0.00052 J
Ethene	0.0026	Not Detected
Helium	0.13	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-25.5-072617

Lab ID#: 1707416B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10072844**	**Date of Collection: 7/26/17 1:05:00 PM**	
Dil. Factor:	**2.52**	**Date of Analysis: 7/29/17 08:05 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.25	1.5
Nitrogen	0.25	76
Carbon Monoxide	0.025	Not Detected
Methane	0.00025	6.7
Carbon Dioxide	0.025	16
Ethane	0.0025	0.0025 J
Ethene	0.0025	Not Detected
Helium	0.13	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: Lab Blank

Lab ID#: 1707416B-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10072828a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/28/17 04:23 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	0.0033 J
Nitrogen	0.10	0.016 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#: 1707416B-06B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10072829c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/28/17 04:49 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#: 1707416B-07A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10072827**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/28/17 03:58 PM**	

Compound	%Recovery	Method Limits
Oxygen	101	85-115
Nitrogen	88	85-115
Carbon Monoxide	90	85-115
Methane	99	85-115
Carbon Dioxide	98	85-115
Ethane	98	85-115
Ethene	98	85-115
Helium	100	85-115

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 1707416B-07AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10072848**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/29/17 10:01 AM**	

Compound	%Recovery	Method Limits
Oxygen	101	85-115
Nitrogen	88	85-115
Carbon Monoxide	90	85-115
Methane	101	85-115
Carbon Dioxide	98	85-115
Ethane	100	85-115
Ethene	100	85-115
Helium	100	85-115

Container Type: NA - Not Applicable