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February 2, 2020

Illinois Department of Transportation
Keith Roberts, PE
Acting Regional 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. Roberts,

AECOM, on behalf of Shell Oil Products US (SOPUS), is submitting the attached analytical results for soil vapor samples collected in 2020 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, CHMM
Environmental Scientist

Robert E. Mooshegian, STS
Senior Program Manager

Attachments

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

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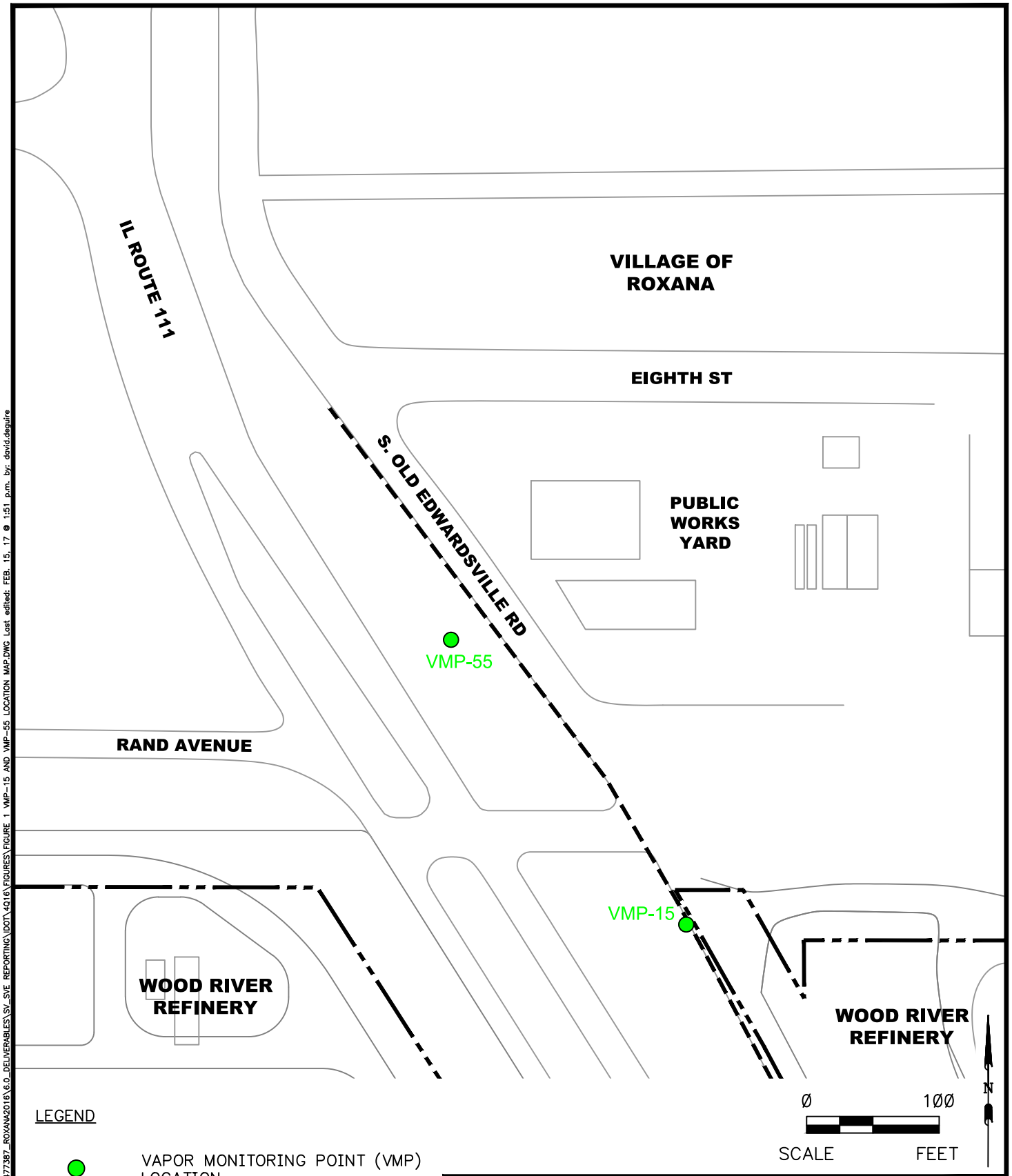

LEGEND

- VAPOR MONITORING POINT (VMP) LOCATION
- APPROXIMATE BOUNDARY OF WOOD RIVER REFINERY
- APPROXIMATE EAST BOUNDARY OF IL ROUTE 111 RIGHT-OF-WAY

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\DOT\4Q16\FIGURES\FIGURE 1 VMP-15 AND VMP-55 LOCATION MAP.DWG Last edited: FEB. 15, 17 @ 1:51 p.m. by: dovid.deguire

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2/11/2020
Ms. Elizabeth Kunkel
AECOM
100 N. Broadway, 20th Floor

St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60619901-1.04.001
Workorder #: 2001664A

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 1/29/2020 at Air Toxics Ltd.

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

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: 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 #: 2001664A

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. #**	121921
FAX:		**PROJECT #**	60619901-1.04.001 Roxana Quarterly Soil Vapor
DATE RECEIVED:	01/29/2020	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	02/11/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-012820	TO-15	8.4 "Hg	15.5 psi
02A	VMP-15-21.5-012820	TO-15	7.8 "Hg	16.2 psi
03A	VMP-15-25.5-012820	TO-15	6.9 "Hg	16.2 psi
03B	VMP-15-25.5-012820	TO-15	6.9 "Hg	16.2 psi
04A	VMP-55-20-012820	TO-15	9.4 "Hg	15.3 psi
04B	VMP-55-20-012820	TO-15	9.4 "Hg	15.3 psi
05A	Lab Blank	TO-15	NA	NA
05B	Lab Blank	TO-15	NA	NA
06A	CCV	TO-15	NA	NA
06B	CCV	TO-15	NA	NA
07A	LCS	TO-15	NA	NA
07AA	LCSD	TO-15	NA	NA
07B	LCS	TO-15	NA	NA
07BB	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 02/11/20

Technical Director

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

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

LABORATORY NARRATIVE
EPA Method TO-15
AECOM
Workorder# 2001664A

Four 1 Liter Summa Canister samples were received on January 29, 2020. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

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

Due to high-level target compounds, samples VMP-15-25.5-012820 and VMP-55-20-012820 were analyzed twice. In the "A" fraction, the sample was diluted to bring the highest-level compounds within the calibration range. The "B" fraction is also reported by client request and may be reported with "E" flags indicating the compound exceeds the calibration range. Both runs and associated QC are reported.

Dilution was performed on samples VMP-15-25.5-012820 and VMP-55-20-012820 due to the presence of high level target species.

The recovery of surrogate 1,2-Dichloroethane-d4 in sample VMP-55-20-012820 was outside laboratory control limits due to high level hydrocarbon matrix interference. The surrogate recovery is flagged.

Definition of Data Qualifying Flags

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

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

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

r1-File was requantified for the purpose of reissue

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

Client Sample ID: VMP-15-5-012820

Lab ID#: 2001664A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	0.40 J	7.0	2.0 J

Client Sample ID: VMP-15-21.5-012820

Lab ID#: 2001664A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	0.27 J	7.0	1.3 J
2,2,4-Trimethylpentane	1.4	69	6.6	320
Benzene	1.4	0.30 J	4.5	0.95 J

Client Sample ID: VMP-15-25.5-012820

Lab ID#: 2001664A-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2,2,4-Trimethylpentane	6.8	1700	32	7900
Benzene	6.8	2.5 J	22	7.9 J
Butane	27	57	65	140
Isopentane	27	15 J	80	44 J

Client Sample ID: VMP-15-25.5-012820

Lab ID#: 2001664A-03B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2,2,4-Trimethylpentane	3.4	1600 E	16	7300 E
Benzene	3.4	2.3 J	11	7.5 J
Butane	14	45	32	110
Isopentane	14	12 J	40	36 J

Client Sample ID: VMP-55-20-012820

Lab ID#: 2001664A-04A

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

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

Client Sample ID: VMP-55-20-012820

Lab ID#: 2001664A-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	15	5.1 J	54	18 J
2,2,4-Trimethylpentane	15	22000	69	100000
Butane	59	190	140	450
Isopentane	59	9900	180	29000

Client Sample ID: VMP-55-20-012820

Lab ID#: 2001664A-04B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	120	16 J	430	56 J
2,2,4-Trimethylpentane	30	20000 E	140	91000 E
Butane	120	220	280	530
Isopentane	120	7600	350	22000

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Client Sample ID: VMP-15-5-012820

Lab ID#: 2001664A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020422**	**Date of Collection:**	**1/28/20 8:44:00 AM**
Dil. Factor:	**2.85**	**Date of Analysis:**	**2/4/20 11:27 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	0.40 J	7.0	2.0 J
Freon 114	1.4	Not Detected	10	Not Detected
Chloromethane	14	Not Detected	29	Not Detected
Vinyl Chloride	1.4	Not Detected	3.6	Not Detected
1,3-Butadiene	1.4	Not Detected	3.2	Not Detected
Bromomethane	14	Not Detected	55	Not Detected
Chloroethane	5.7	Not Detected	15	Not Detected
Freon 11	1.4	Not Detected	8.0	Not Detected
Ethanol	5.7	Not Detected	11	Not Detected
Freon 113	1.4	Not Detected	11	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Acetone	14	Not Detected	34	Not Detected
2-Propanol	5.7	Not Detected	14	Not Detected
Carbon Disulfide	5.7	Not Detected	18	Not Detected
3-Chloropropene	5.7	Not Detected	18	Not Detected
Methylene Chloride	14	Not Detected	50	Not Detected
Methyl tert-butyl ether	5.7	Not Detected	20	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Hexane	1.4	Not Detected	5.0	Not Detected
1,1-Dichloroethane	1.4	Not Detected	5.8	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.7	Not Detected	17	Not Detected
cis-1,2-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Tetrahydrofuran	1.4	Not Detected	4.2	Not Detected
Chloroform	1.4	Not Detected	7.0	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.8	Not Detected
Cyclohexane	1.4	Not Detected	4.9	Not Detected
Carbon Tetrachloride	1.4	Not Detected	9.0	Not Detected
2,2,4-Trimethylpentane	1.4	Not Detected	6.6	Not Detected
Benzene	1.4	Not Detected	4.6	Not Detected
1,2-Dichloroethane	1.4	Not Detected	5.8	Not Detected
Heptane	1.4	Not Detected	5.8	Not Detected
Trichloroethene	1.4	Not Detected	7.6	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.6	Not Detected
1,4-Dioxane	5.7	Not Detected	20	Not Detected
Bromodichloromethane	1.4	Not Detected	9.5	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.5	Not Detected
4-Methyl-2-pentanone	1.4	Not Detected	5.8	Not Detected
Toluene	1.4	Not Detected	5.4	Not Detected
trans-1,3-Dichloropropene	1.4	Not Detected	6.5	Not Detected
1,1,2-Trichloroethane	1.4	Not Detected	7.8	Not Detected
Tetrachloroethene	1.4	Not Detected	9.7	Not Detected
2-Hexanone	5.7	Not Detected	23	Not Detected

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Client Sample ID: VMP-15-5-012820

Lab ID#: 2001664A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020422**	**Date of Collection:**	**1/28/20 8:44:00 AM**
Dil. Factor:	**2.85**	**Date of Analysis:**	**2/4/20 11:27 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.6	Not Detected
Ethyl Benzene	1.4	Not Detected	6.2	Not Detected
m,p-Xylene	1.4	Not Detected	6.2	Not Detected
o-Xylene	1.4	Not Detected	6.2	Not Detected
Styrene	1.4	Not Detected	6.1	Not Detected
Bromoform	1.4	Not Detected	15	Not Detected
Cumene	1.4	Not Detected	7.0	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.8	Not Detected
Propylbenzene	1.4	Not Detected	7.0	Not Detected
4-Ethyltoluene	1.4	Not Detected	7.0	Not Detected
1,3,5-Trimethylbenzene	1.4	Not Detected	7.0	Not Detected
1,2,4-Trimethylbenzene	1.4	Not Detected	7.0	Not Detected
1,3-Dichlorobenzene	1.4	Not Detected	8.6	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.6	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.4	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.6	Not Detected
1,2,4-Trichlorobenzene	5.7	Not Detected	42	Not Detected
Hexachlorobutadiene	5.7	Not Detected	61	Not Detected
Butane	5.7	Not Detected	14	Not Detected
Isopentane	5.7	Not Detected	17	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

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

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Client Sample ID: VMP-15-21.5-012820

Lab ID#: 2001664A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020423**	**Date of Collection:**	**1/28/20 8:54:00 AM**
Dil. Factor:	**2.84**	**Date of Analysis:**	**2/4/20 11:53 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	0.27 J	7.0	1.3 J
Freon 114	1.4	Not Detected	9.9	Not Detected
Chloromethane	14	Not Detected	29	Not Detected
Vinyl Chloride	1.4	Not Detected	3.6	Not Detected
1,3-Butadiene	1.4	Not Detected	3.1	Not Detected
Bromomethane	14	Not Detected	55	Not Detected
Chloroethane	5.7	Not Detected	15	Not Detected
Freon 11	1.4	Not Detected	8.0	Not Detected
Ethanol	5.7	Not Detected	11	Not Detected
Freon 113	1.4	Not Detected	11	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Acetone	14	Not Detected	34	Not Detected
2-Propanol	5.7	Not Detected	14	Not Detected
Carbon Disulfide	5.7	Not Detected	18	Not Detected
3-Chloropropene	5.7	Not Detected	18	Not Detected
Methylene Chloride	14	Not Detected	49	Not Detected
Methyl tert-butyl ether	5.7	Not Detected	20	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Hexane	1.4	Not Detected	5.0	Not Detected
1,1-Dichloroethane	1.4	Not Detected	5.7	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.7	Not Detected	17	Not Detected
cis-1,2-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Tetrahydrofuran	1.4	Not Detected	4.2	Not Detected
Chloroform	1.4	Not Detected	6.9	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.7	Not Detected
Cyclohexane	1.4	Not Detected	4.9	Not Detected
Carbon Tetrachloride	1.4	Not Detected	8.9	Not Detected
2,2,4-Trimethylpentane	1.4	69	6.6	320
Benzene	1.4	0.30 J	4.5	0.95 J
1,2-Dichloroethane	1.4	Not Detected	5.7	Not Detected
Heptane	1.4	Not Detected	5.8	Not Detected
Trichloroethene	1.4	Not Detected	7.6	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.6	Not Detected
1,4-Dioxane	5.7	Not Detected	20	Not Detected
Bromodichloromethane	1.4	Not Detected	9.5	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.4	Not Detected
4-Methyl-2-pentanone	1.4	Not Detected	5.8	Not Detected
Toluene	1.4	Not Detected	5.4	Not Detected
trans-1,3-Dichloropropene	1.4	Not Detected	6.4	Not Detected
1,1,2-Trichloroethane	1.4	Not Detected	7.7	Not Detected
Tetrachloroethene	1.4	Not Detected	9.6	Not Detected
2-Hexanone	5.7	Not Detected	23	Not Detected

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Client Sample ID: VMP-15-21.5-012820

Lab ID#: 2001664A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020423**	**Date of Collection:**	**1/28/20 8:54:00 AM**
Dil. Factor:	**2.84**	**Date of Analysis:**	**2/4/20 11:53 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.5	Not Detected
Ethyl Benzene	1.4	Not Detected	6.2	Not Detected
m,p-Xylene	1.4	Not Detected	6.2	Not Detected
o-Xylene	1.4	Not Detected	6.2	Not Detected
Styrene	1.4	Not Detected	6.0	Not Detected
Bromoform	1.4	Not Detected	15	Not Detected
Cumene	1.4	Not Detected	7.0	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.7	Not Detected
Propylbenzene	1.4	Not Detected	7.0	Not Detected
4-Ethyltoluene	1.4	Not Detected	7.0	Not Detected
1,3,5-Trimethylbenzene	1.4	Not Detected	7.0	Not Detected
1,2,4-Trimethylbenzene	1.4	Not Detected	7.0	Not Detected
1,3-Dichlorobenzene	1.4	Not Detected	8.5	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.5	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.4	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.5	Not Detected
1,2,4-Trichlorobenzene	5.7	Not Detected	42	Not Detected
Hexachlorobutadiene	5.7	Not Detected	60	Not Detected
Butane	5.7	Not Detected	14	Not Detected
Isopentane	5.7	Not Detected	17	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: VMP-15-25.5-012820

Lab ID#: 2001664A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020427**	**Date of Collection:**	**1/28/20 9:08:00 AM**
Dil. Factor:	**13.6**	**Date of Analysis:**	**2/5/20 08:04 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	6.8	Not Detected	34	Not Detected
Freon 114	6.8	Not Detected	48	Not Detected
Chloromethane	68	Not Detected	140	Not Detected
Vinyl Chloride	6.8	Not Detected	17	Not Detected
1,3-Butadiene	6.8	Not Detected	15	Not Detected
Bromomethane	68	Not Detected	260	Not Detected
Chloroethane	27	Not Detected	72	Not Detected
Freon 11	6.8	Not Detected	38	Not Detected
Ethanol	27	Not Detected	51	Not Detected
Freon 113	6.8	Not Detected	52	Not Detected
1,1-Dichloroethene	6.8	Not Detected	27	Not Detected
Acetone	68	Not Detected	160	Not Detected
2-Propanol	27	Not Detected	67	Not Detected
Carbon Disulfide	27	Not Detected	85	Not Detected
3-Chloropropene	27	Not Detected	85	Not Detected
Methylene Chloride	68	Not Detected	240	Not Detected
Methyl tert-butyl ether	27	Not Detected	98	Not Detected
trans-1,2-Dichloroethene	6.8	Not Detected	27	Not Detected
Hexane	6.8	Not Detected	24	Not Detected
1,1-Dichloroethane	6.8	Not Detected	28	Not Detected
2-Butanone (Methyl Ethyl Ketone)	27	Not Detected	80	Not Detected
cis-1,2-Dichloroethene	6.8	Not Detected	27	Not Detected
Tetrahydrofuran	6.8	Not Detected	20	Not Detected
Chloroform	6.8	Not Detected	33	Not Detected
1,1,1-Trichloroethane	6.8	Not Detected	37	Not Detected
Cyclohexane	6.8	Not Detected	23	Not Detected
Carbon Tetrachloride	6.8	Not Detected	43	Not Detected
2,2,4-Trimethylpentane	6.8	1700	32	7900
Benzene	6.8	2.5 J	22	7.9 J
1,2-Dichloroethane	6.8	Not Detected	28	Not Detected
Heptane	6.8	Not Detected	28	Not Detected
Trichloroethene	6.8	Not Detected	36	Not Detected
1,2-Dichloropropane	6.8	Not Detected	31	Not Detected
1,4-Dioxane	27	Not Detected	98	Not Detected
Bromodichloromethane	6.8	Not Detected	46	Not Detected
cis-1,3-Dichloropropene	6.8	Not Detected	31	Not Detected
4-Methyl-2-pentanone	6.8	Not Detected	28	Not Detected
Toluene	6.8	Not Detected	26	Not Detected
trans-1,3-Dichloropropene	6.8	Not Detected	31	Not Detected
1,1,2-Trichloroethane	6.8	Not Detected	37	Not Detected
Tetrachloroethene	6.8	Not Detected	46	Not Detected
2-Hexanone	27	Not Detected	110	Not Detected

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Client Sample ID: VMP-15-25.5-012820

Lab ID#: 2001664A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020427**	**Date of Collection:**	**1/28/20 9:08:00 AM**
Dil. Factor:	**13.6**	**Date of Analysis:**	**2/5/20 08:04 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	6.8	Not Detected	58	Not Detected
1,2-Dibromoethane (EDB)	6.8	Not Detected	52	Not Detected
Chlorobenzene	6.8	Not Detected	31	Not Detected
Ethyl Benzene	6.8	Not Detected	30	Not Detected
m,p-Xylene	6.8	Not Detected	30	Not Detected
o-Xylene	6.8	Not Detected	30	Not Detected
Styrene	6.8	Not Detected	29	Not Detected
Bromoform	6.8	Not Detected	70	Not Detected
Cumene	6.8	Not Detected	33	Not Detected
1,1,2,2-Tetrachloroethane	6.8	Not Detected	47	Not Detected
Propylbenzene	6.8	Not Detected	33	Not Detected
4-Ethyltoluene	6.8	Not Detected	33	Not Detected
1,3,5-Trimethylbenzene	6.8	Not Detected	33	Not Detected
1,2,4-Trimethylbenzene	6.8	Not Detected	33	Not Detected
1,3-Dichlorobenzene	6.8	Not Detected	41	Not Detected
1,4-Dichlorobenzene	6.8	Not Detected	41	Not Detected
alpha-Chlorotoluene	6.8	Not Detected	35	Not Detected
1,2-Dichlorobenzene	6.8	Not Detected	41	Not Detected
1,2,4-Trichlorobenzene	27	Not Detected	200	Not Detected
Hexachlorobutadiene	27	Not Detected	290	Not Detected
Butane	27	57	65	140
Isopentane	27	15 J	80	44 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

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

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Client Sample ID: VMP-15-25.5-012820

Lab ID#: 2001664A-03B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020424**	**Date of Collection:**	**1/28/20 9:08:00 AM**
Dil. Factor:	**6.82**	**Date of Analysis:**	**2/5/20 12:17 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	3.4	Not Detected	17	Not Detected
Freon 114	3.4	Not Detected	24	Not Detected
Chloromethane	34	Not Detected	70	Not Detected
Vinyl Chloride	3.4	Not Detected	8.7	Not Detected
1,3-Butadiene	3.4	Not Detected	7.5	Not Detected
Bromomethane	34	Not Detected	130	Not Detected
Chloroethane	14	Not Detected	36	Not Detected
Freon 11	3.4	Not Detected	19	Not Detected
Ethanol	14	Not Detected	26	Not Detected
Freon 113	3.4	Not Detected	26	Not Detected
1,1-Dichloroethene	3.4	Not Detected	14	Not Detected
Acetone	34	Not Detected	81	Not Detected
2-Propanol	14	Not Detected	34	Not Detected
Carbon Disulfide	14	Not Detected	42	Not Detected
3-Chloropropene	14	Not Detected	43	Not Detected
Methylene Chloride	34	Not Detected	120	Not Detected
Methyl tert-butyl ether	14	Not Detected	49	Not Detected
trans-1,2-Dichloroethene	3.4	Not Detected	14	Not Detected
Hexane	3.4	Not Detected	12	Not Detected
1,1-Dichloroethane	3.4	Not Detected	14	Not Detected
2-Butanone (Methyl Ethyl Ketone)	14	Not Detected	40	Not Detected
cis-1,2-Dichloroethene	3.4	Not Detected	14	Not Detected
Tetrahydrofuran	3.4	Not Detected	10	Not Detected
Chloroform	3.4	Not Detected	17	Not Detected
1,1,1-Trichloroethane	3.4	Not Detected	19	Not Detected
Cyclohexane	3.4	Not Detected	12	Not Detected
Carbon Tetrachloride	3.4	Not Detected	21	Not Detected
2,2,4-Trimethylpentane	3.4	1600 E	16	7300 E
Benzene	3.4	2.3 J	11	7.5 J
1,2-Dichloroethane	3.4	Not Detected	14	Not Detected
Heptane	3.4	Not Detected	14	Not Detected
Trichloroethene	3.4	Not Detected	18	Not Detected
1,2-Dichloropropane	3.4	Not Detected	16	Not Detected
1,4-Dioxane	14	Not Detected	49	Not Detected
Bromodichloromethane	3.4	Not Detected	23	Not Detected
cis-1,3-Dichloropropene	3.4	Not Detected	15	Not Detected
4-Methyl-2-pentanone	3.4	Not Detected	14	Not Detected
Toluene	3.4	Not Detected	13	Not Detected
trans-1,3-Dichloropropene	3.4	Not Detected	15	Not Detected
1,1,2-Trichloroethane	3.4	Not Detected	19	Not Detected
Tetrachloroethene	3.4	Not Detected	23	Not Detected
2-Hexanone	14	Not Detected	56	Not Detected

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Client Sample ID: VMP-15-25.5-012820

Lab ID#: 2001664A-03B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020424**	**Date of Collection:**	**1/28/20 9:08:00 AM**
Dil. Factor:	**6.82**	**Date of Analysis:**	**2/5/20 12:17 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	3.4	Not Detected	29	Not Detected
1,2-Dibromoethane (EDB)	3.4	Not Detected	26	Not Detected
Chlorobenzene	3.4	Not Detected	16	Not Detected
Ethyl Benzene	3.4	Not Detected	15	Not Detected
m,p-Xylene	3.4	Not Detected	15	Not Detected
o-Xylene	3.4	Not Detected	15	Not Detected
Styrene	3.4	Not Detected	14	Not Detected
Bromoform	3.4	Not Detected	35	Not Detected
Cumene	3.4	Not Detected	17	Not Detected
1,1,2,2-Tetrachloroethane	3.4	Not Detected	23	Not Detected
Propylbenzene	3.4	Not Detected	17	Not Detected
4-Ethyltoluene	3.4	Not Detected	17	Not Detected
1,3,5-Trimethylbenzene	3.4	Not Detected	17	Not Detected
1,2,4-Trimethylbenzene	3.4	Not Detected	17	Not Detected
1,3-Dichlorobenzene	3.4	Not Detected	20	Not Detected
1,4-Dichlorobenzene	3.4	Not Detected	20	Not Detected
alpha-Chlorotoluene	3.4	Not Detected	18	Not Detected
1,2-Dichlorobenzene	3.4	Not Detected	20	Not Detected
1,2,4-Trichlorobenzene	14	Not Detected	100	Not Detected
Hexachlorobutadiene	14	Not Detected	140	Not Detected
Butane	14	45	32	110
Isopentane	14	12 J	40	36 J

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

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: VMP-55-20-012820

Lab ID#: 2001664A-04A

EPA METHOD TO-15 GC/MS

File Name:	**14020620**	**Date of Collection: 1/28/20 9:48:00 AM**	
Dil. Factor:	**2.97**	**Date of Analysis: 2/6/20 04:45 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	15	Not Detected	73	Not Detected
Freon 114	15	Not Detected	100	Not Detected
Chloromethane	59	Not Detected	120	Not Detected
Vinyl Chloride	15	Not Detected	38	Not Detected
1,3-Butadiene	15	Not Detected	33	Not Detected
Bromomethane	59	Not Detected	230	Not Detected
Chloroethane	59	Not Detected	160	Not Detected
Freon 11	15	Not Detected	83	Not Detected
Ethanol	59	Not Detected	110	Not Detected
Freon 113	15	Not Detected	110	Not Detected
1,1-Dichloroethene	15	Not Detected	59	Not Detected
Acetone	59	Not Detected	140	Not Detected
2-Propanol	59	Not Detected	140	Not Detected
Carbon Disulfide	59	Not Detected	180	Not Detected
3-Chloropropene	59	Not Detected	180	Not Detected
Methylene Chloride	59	Not Detected	210	Not Detected
Methyl tert-butyl ether	15	5.1 J	54	18 J
trans-1,2-Dichloroethene	15	Not Detected	59	Not Detected
Hexane	15	Not Detected	52	Not Detected
1,1-Dichloroethane	15	Not Detected	60	Not Detected
2-Butanone (Methyl Ethyl Ketone)	59	Not Detected	180	Not Detected
cis-1,2-Dichloroethene	15	Not Detected	59	Not Detected
Tetrahydrofuran	15	Not Detected	44	Not Detected
Chloroform	15	Not Detected	72	Not Detected
1,1,1-Trichloroethane	15	Not Detected	81	Not Detected
Cyclohexane	15	Not Detected	51	Not Detected
Carbon Tetrachloride	15	Not Detected	93	Not Detected
2,2,4-Trimethylpentane	15	22000	69	100000
Benzene	15	Not Detected	47	Not Detected
1,2-Dichloroethane	15	Not Detected	60	Not Detected
Heptane	15	Not Detected	61	Not Detected
Trichloroethene	15	Not Detected	80	Not Detected
1,2-Dichloropropane	15	Not Detected	69	Not Detected
1,4-Dioxane	59	Not Detected	210	Not Detected
Bromodichloromethane	15	Not Detected	100	Not Detected
cis-1,3-Dichloropropene	15	Not Detected	67	Not Detected
4-Methyl-2-pentanone	15	Not Detected	61	Not Detected
Toluene	15	Not Detected	56	Not Detected
trans-1,3-Dichloropropene	15	Not Detected	67	Not Detected
1,1,2-Trichloroethane	15	Not Detected	81	Not Detected
Tetrachloroethene	15	Not Detected	100	Not Detected
2-Hexanone	59	Not Detected	240	Not Detected

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Client Sample ID: VMP-55-20-012820

Lab ID#: 2001664A-04A

EPA METHOD TO-15 GC/MS

File Name:	**14020620**	**Date of Collection: 1/28/20 9:48:00 AM**	
Dil. Factor:	**2.97**	**Date of Analysis: 2/6/20 04:45 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	15	Not Detected	130	Not Detected
1,2-Dibromoethane (EDB)	15	Not Detected	110	Not Detected
Chlorobenzene	15	Not Detected	68	Not Detected
Ethyl Benzene	15	Not Detected	64	Not Detected
m,p-Xylene	15	Not Detected	64	Not Detected
o-Xylene	15	Not Detected	64	Not Detected
Styrene	15	Not Detected	63	Not Detected
Bromoform	15	Not Detected	150	Not Detected
Cumene	15	Not Detected	73	Not Detected
1,1,2,2-Tetrachloroethane	15	Not Detected	100	Not Detected
Propylbenzene	15	Not Detected	73	Not Detected
4-Ethyltoluene	15	Not Detected	73	Not Detected
1,3,5-Trimethylbenzene	15	Not Detected	73	Not Detected
1,2,4-Trimethylbenzene	15	Not Detected	73	Not Detected
1,3-Dichlorobenzene	15	Not Detected	89	Not Detected
1,4-Dichlorobenzene	15	Not Detected	89	Not Detected
alpha-Chlorotoluene	15	Not Detected	77	Not Detected
1,2-Dichlorobenzene	15	Not Detected	89	Not Detected
1,2,4-Trichlorobenzene	59	Not Detected	440	Not Detected
Hexachlorobutadiene	59	Not Detected	630	Not Detected
Butane	59	190	140	450
Isopentane	59	9900	180	29000

J = Estimated value.
Q = Exceeds Quality Control limits of 70% to 130%, due to matrix effects.
Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	141 Q	70-130
Toluene-d8	108	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: VMP-55-20-012820

Lab ID#: 2001664A-04B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020425**	**Date of Collection:**	**1/28/20 9:48:00 AM**
Dil. Factor:	**59.4**	**Date of Analysis:**	**2/5/20 12:41 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	30	Not Detected	150	Not Detected
Freon 114	30	Not Detected	210	Not Detected
Chloromethane	300	Not Detected	610	Not Detected
Vinyl Chloride	30	Not Detected	76	Not Detected
1,3-Butadiene	30	Not Detected	66	Not Detected
Bromomethane	300	Not Detected	1200	Not Detected
Chloroethane	120	Not Detected	310	Not Detected
Freon 11	30	Not Detected	170	Not Detected
Ethanol	120	Not Detected	220	Not Detected
Freon 113	30	Not Detected	230	Not Detected
1,1-Dichloroethene	30	Not Detected	120	Not Detected
Acetone	300	Not Detected	700	Not Detected
2-Propanol	120	Not Detected	290	Not Detected
Carbon Disulfide	120	Not Detected	370	Not Detected
3-Chloropropene	120	Not Detected	370	Not Detected
Methylene Chloride	300	Not Detected	1000	Not Detected
Methyl tert-butyl ether	120	16 J	430	56 J
trans-1,2-Dichloroethene	30	Not Detected	120	Not Detected
Hexane	30	Not Detected	100	Not Detected
1,1-Dichloroethane	30	Not Detected	120	Not Detected
2-Butanone (Methyl Ethyl Ketone)	120	Not Detected	350	Not Detected
cis-1,2-Dichloroethene	30	Not Detected	120	Not Detected
Tetrahydrofuran	30	Not Detected	88	Not Detected
Chloroform	30	Not Detected	140	Not Detected
1,1,1-Trichloroethane	30	Not Detected	160	Not Detected
Cyclohexane	30	Not Detected	100	Not Detected
Carbon Tetrachloride	30	Not Detected	190	Not Detected
2,2,4-Trimethylpentane	30	20000 E	140	91000 E
Benzene	30	Not Detected	95	Not Detected
1,2-Dichloroethane	30	Not Detected	120	Not Detected
Heptane	30	Not Detected	120	Not Detected
Trichloroethene	30	Not Detected	160	Not Detected
1,2-Dichloropropane	30	Not Detected	140	Not Detected
1,4-Dioxane	120	Not Detected	430	Not Detected
Bromodichloromethane	30	Not Detected	200	Not Detected
cis-1,3-Dichloropropene	30	Not Detected	130	Not Detected
4-Methyl-2-pentanone	30	Not Detected	120	Not Detected
Toluene	30	Not Detected	110	Not Detected
trans-1,3-Dichloropropene	30	Not Detected	130	Not Detected
1,1,2-Trichloroethane	30	Not Detected	160	Not Detected
Tetrachloroethene	30	Not Detected	200	Not Detected
2-Hexanone	120	Not Detected	490	Not Detected

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Client Sample ID: VMP-55-20-012820

Lab ID#: 2001664A-04B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020425**	**Date of Collection:**	**1/28/20 9:48:00 AM**
Dil. Factor:	**59.4**	**Date of Analysis:**	**2/5/20 12:41 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	30	Not Detected	250	Not Detected
1,2-Dibromoethane (EDB)	30	Not Detected	230	Not Detected
Chlorobenzene	30	Not Detected	140	Not Detected
Ethyl Benzene	30	Not Detected	130	Not Detected
m,p-Xylene	30	Not Detected	130	Not Detected
o-Xylene	30	Not Detected	130	Not Detected
Styrene	30	Not Detected	130	Not Detected
Bromoform	30	Not Detected	310	Not Detected
Cumene	30	Not Detected	140	Not Detected
1,1,2,2-Tetrachloroethane	30	Not Detected	200	Not Detected
Propylbenzene	30	Not Detected	150	Not Detected
4-Ethyltoluene	30	Not Detected	150	Not Detected
1,3,5-Trimethylbenzene	30	Not Detected	150	Not Detected
1,2,4-Trimethylbenzene	30	Not Detected	140	Not Detected
1,3-Dichlorobenzene	30	Not Detected	180	Not Detected
1,4-Dichlorobenzene	30	Not Detected	180	Not Detected
alpha-Chlorotoluene	30	Not Detected	150	Not Detected
1,2-Dichlorobenzene	30	Not Detected	180	Not Detected
1,2,4-Trichlorobenzene	120	Not Detected	880	Not Detected
Hexachlorobutadiene	120	Not Detected	1300	Not Detected
Butane	120	220	280	530
Isopentane	120	7600	350	22000

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

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2001664A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020405e**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/4/20 11:17 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	2.0	Not Detected	7.2	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	0.19 J	2.7	1.0 J
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#: 2001664A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020405e**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/4/20 11:17 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	0.042 J	3.8	0.33 J
Chlorobenzene	0.50	0.055 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	0.053 J	2.1	0.23 J
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	0.12 J	2.4	0.56 J
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	0.26 J	2.4	1.3 J
1,2,4-Trimethylbenzene	0.50	0.20 J	2.4	0.99 J
1,3-Dichlorobenzene	0.50	0.10 J	3.0	0.62 J
1,4-Dichlorobenzene	0.50	0.11 J	3.0	0.64 J
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	0.11 J	3.0	0.64 J
1,2,4-Trichlorobenzene	2.0	0.15 J	15	1.1 J
Hexachlorobutadiene	2.0	0.16 J	21	1.7 J
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	98	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2001664A-05B

EPA METHOD TO-15 GC/MS

File Name:	**14020605a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 11:02 AM**	

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#: 2001664A-05B

EPA METHOD TO-15 GC/MS

File Name:	**14020605a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 11:02 AM**	

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	Not Detected	59	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: CCV

Lab ID#: 2001664A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020402**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/4/20 09:48 AM**	

Compound	%Recovery
Freon 12	99
Freon 114	101
Chloromethane	98
Vinyl Chloride	96
1,3-Butadiene	84
Bromomethane	96
Chloroethane	95
Freon 11	103
Ethanol	96
Freon 113	104
1,1-Dichloroethene	98
Acetone	102
2-Propanol	99
Carbon Disulfide	94
3-Chloropropene	92
Methylene Chloride	102
Methyl tert-butyl ether	93
trans-1,2-Dichloroethene	98
Hexane	94
1,1-Dichloroethane	98
2-Butanone (Methyl Ethyl Ketone)	96
cis-1,2-Dichloroethene	100
Tetrahydrofuran	96
Chloroform	97
1,1,1-Trichloroethane	99
Cyclohexane	95
Carbon Tetrachloride	108
2,2,4-Trimethylpentane	96
Benzene	97
1,2-Dichloroethane	102
Heptane	94
Trichloroethene	104
1,2-Dichloropropane	100
1,4-Dioxane	96
Bromodichloromethane	102
cis-1,3-Dichloropropene	100
4-Methyl-2-pentanone	95
Toluene	92
trans-1,3-Dichloropropene	100
1,1,2-Trichloroethane	102
Tetrachloroethene	104
2-Hexanone	97

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Client Sample ID: CCV

Lab ID#: 2001664A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020402**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/4/20 09:48 AM**	

Compound	%Recovery
Dibromochloromethane	105
1,2-Dibromoethane (EDB)	104
Chlorobenzene	101
Ethyl Benzene	101
m,p-Xylene	103
o-Xylene	100
Styrene	98
Bromoform	109
Cumene	100
1,1,2,2-Tetrachloroethane	97
Propylbenzene	100
4-Ethyltoluene	100
1,3,5-Trimethylbenzene	99
1,2,4-Trimethylbenzene	99
1,3-Dichlorobenzene	103
1,4-Dichlorobenzene	102
alpha-Chlorotoluene	97
1,2-Dichlorobenzene	102
1,2,4-Trichlorobenzene	99
Hexachlorobutadiene	99
Butane	93
Isopentane	97

Container Type: NA - Not Applicable

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

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Client Sample ID: CCV

Lab ID#: 2001664A-06B

EPA METHOD TO-15 GC/MS

File Name:	**14020602**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 09:53 AM**

Compound	%Recovery
Freon 12	96
Freon 114	97
Chloromethane	107
Vinyl Chloride	95
1,3-Butadiene	104
Bromomethane	91
Chloroethane	95
Freon 11	108
Ethanol	103
Freon 113	98
1,1-Dichloroethene	102
Acetone	109
2-Propanol	101
Carbon Disulfide	96
3-Chloropropene	86
Methylene Chloride	110
Methyl tert-butyl ether	93
trans-1,2-Dichloroethene	88
Hexane	102
1,1-Dichloroethane	100
2-Butanone (Methyl Ethyl Ketone)	92
cis-1,2-Dichloroethene	102
Tetrahydrofuran	95
Chloroform	96
1,1,1-Trichloroethane	99
Cyclohexane	95
Carbon Tetrachloride	100
2,2,4-Trimethylpentane	103
Benzene	93
1,2-Dichloroethane	91
Heptane	86
Trichloroethene	92
1,2-Dichloropropane	90
1,4-Dioxane	90
Bromodichloromethane	88
cis-1,3-Dichloropropene	83
4-Methyl-2-pentanone	78
Toluene	89
trans-1,3-Dichloropropene	86
1,1,2-Trichloroethane	84
Tetrachloroethene	90
2-Hexanone	82

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Client Sample ID: CCV

Lab ID#: 2001664A-06B

EPA METHOD TO-15 GC/MS

File Name:	**14020602**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 09:53 AM**	

Compound	%Recovery
Dibromochloromethane	86
1,2-Dibromoethane (EDB)	90
Chlorobenzene	87
Ethyl Benzene	87
m,p-Xylene	89
o-Xylene	88
Styrene	90
Bromoform	85
Cumene	88
1,1,2,2-Tetrachloroethane	90
Propylbenzene	89
4-Ethyltoluene	89
1,3,5-Trimethylbenzene	94
1,2,4-Trimethylbenzene	84
1,3-Dichlorobenzene	91
1,4-Dichlorobenzene	90
alpha-Chlorotoluene	73
1,2-Dichlorobenzene	92
1,2,4-Trichlorobenzene	93
Hexachlorobutadiene	97
Butane	95
Isopentane	123

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: LCS

Lab ID#: 2001664A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020403**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/4/20 10:13 AM**	

Compound	%Recovery	Method Limits
Freon 12	96	70-130
Freon 114	96	70-130
Chloromethane	100	70-130
Vinyl Chloride	93	70-130
1,3-Butadiene	82	70-130
Bromomethane	96	70-130
Chloroethane	94	70-130
Freon 11	100	70-130
Ethanol	84	70-130
Freon 113	101	70-130
1,1-Dichloroethene	98	70-130
Acetone	99	70-130
2-Propanol	91	70-130
Carbon Disulfide	87	70-130
3-Chloropropene	89	70-130
Methylene Chloride	100	70-130
Methyl tert-butyl ether	93	70-130
trans-1,2-Dichloroethene	88	70-130
Hexane	93	70-130
1,1-Dichloroethane	98	70-130
2-Butanone (Methyl Ethyl Ketone)	91	70-130
cis-1,2-Dichloroethene	106	70-130
Tetrahydrofuran	91	70-130
Chloroform	97	70-130
1,1,1-Trichloroethane	98	70-130
Cyclohexane	94	70-130
Carbon Tetrachloride	107	70-130
2,2,4-Trimethylpentane	95	70-130
Benzene	93	70-130
1,2-Dichloroethane	100	70-130
Heptane	90	70-130
Trichloroethene	100	70-130
1,2-Dichloropropane	98	70-130
1,4-Dioxane	96	70-130
Bromodichloromethane	98	70-130
cis-1,3-Dichloropropene	99	70-130
4-Methyl-2-pentanone	91	70-130
Toluene	92	70-130
trans-1,3-Dichloropropene	99	70-130
1,1,2-Trichloroethane	98	70-130
Tetrachloroethene	103	70-130
2-Hexanone	92	70-130

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Client Sample ID: LCS

Lab ID#: 2001664A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020403**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/4/20 10:13 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	104	70-130
1,2-Dibromoethane (EDB)	102	70-130
Chlorobenzene	97	70-130
Ethyl Benzene	99	70-130
m,p-Xylene	101	70-130
o-Xylene	99	70-130
Styrene	93	70-130
Bromoform	103	70-130
Cumene	97	70-130
1,1,2,2-Tetrachloroethane	97	70-130
Propylbenzene	95	70-130
4-Ethyltoluene	95	70-130
1,3,5-Trimethylbenzene	96	70-130
1,2,4-Trimethylbenzene	95	70-130
1,3-Dichlorobenzene	98	70-130
1,4-Dichlorobenzene	97	70-130
alpha-Chlorotoluene	88	70-130
1,2-Dichlorobenzene	99	70-130
1,2,4-Trichlorobenzene	84	70-130
Hexachlorobutadiene	85	70-130
Butane	91	60-140
Isopentane	92	60-140

Container Type: NA - Not Applicable

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

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Client Sample ID: LCSD

Lab ID#: 2001664A-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020404**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/4/20 10:38 AM**	

Compound	%Recovery	Method Limits
Freon 12	96	70-130
Freon 114	97	70-130
Chloromethane	101	70-130
Vinyl Chloride	94	70-130
1,3-Butadiene	82	70-130
Bromomethane	96	70-130
Chloroethane	93	70-130
Freon 11	102	70-130
Ethanol	81	70-130
Freon 113	100	70-130
1,1-Dichloroethene	96	70-130
Acetone	99	70-130
2-Propanol	92	70-130
Carbon Disulfide	88	70-130
3-Chloropropene	90	70-130
Methylene Chloride	100	70-130
Methyl tert-butyl ether	93	70-130
trans-1,2-Dichloroethene	87	70-130
Hexane	93	70-130
1,1-Dichloroethane	98	70-130
2-Butanone (Methyl Ethyl Ketone)	92	70-130
cis-1,2-Dichloroethene	106	70-130
Tetrahydrofuran	92	70-130
Chloroform	97	70-130
1,1,1-Trichloroethane	98	70-130
Cyclohexane	94	70-130
Carbon Tetrachloride	107	70-130
2,2,4-Trimethylpentane	96	70-130
Benzene	94	70-130
1,2-Dichloroethane	101	70-130
Heptane	90	70-130
Trichloroethene	100	70-130
1,2-Dichloropropane	98	70-130
1,4-Dioxane	95	70-130
Bromodichloromethane	98	70-130
cis-1,3-Dichloropropene	99	70-130
4-Methyl-2-pentanone	92	70-130
Toluene	93	70-130
trans-1,3-Dichloropropene	99	70-130
1,1,2-Trichloroethane	97	70-130
Tetrachloroethene	102	70-130
2-Hexanone	92	70-130

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Client Sample ID: LCSD

Lab ID#: 2001664A-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3020404**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/4/20 10:38 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	103	70-130
1,2-Dibromoethane (EDB)	100	70-130
Chlorobenzene	97	70-130
Ethyl Benzene	98	70-130
m,p-Xylene	100	70-130
o-Xylene	98	70-130
Styrene	92	70-130
Bromoform	103	70-130
Cumene	97	70-130
1,1,2,2-Tetrachloroethane	96	70-130
Propylbenzene	95	70-130
4-Ethyltoluene	93	70-130
1,3,5-Trimethylbenzene	96	70-130
1,2,4-Trimethylbenzene	95	70-130
1,3-Dichlorobenzene	99	70-130
1,4-Dichlorobenzene	97	70-130
alpha-Chlorotoluene	88	70-130
1,2-Dichlorobenzene	98	70-130
1,2,4-Trichlorobenzene	83	70-130
Hexachlorobutadiene	84	70-130
Butane	91	60-140
Isopentane	92	60-140

Container Type: NA - Not Applicable

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

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Client Sample ID: LCS

Lab ID#: 2001664A-07B

EPA METHOD TO-15 GC/MS

File Name:	**14020603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 10:16 AM**	

Compound	%Recovery	Method Limits
Freon 12	99	70-130
Freon 114	107	70-130
Chloromethane	115	70-130
Vinyl Chloride	104	70-130
1,3-Butadiene	114	70-130
Bromomethane	82	70-130
Chloroethane	99	70-130
Freon 11	114	70-130
Ethanol	108	70-130
Freon 113	106	70-130
1,1-Dichloroethene	106	70-130
Acetone	116	70-130
2-Propanol	105	70-130
Carbon Disulfide	103	70-130
3-Chloropropene	90	70-130
Methylene Chloride	113	70-130
Methyl tert-butyl ether	78	70-130
trans-1,2-Dichloroethene	104	70-130
Hexane	111	70-130
1,1-Dichloroethane	105	70-130
2-Butanone (Methyl Ethyl Ketone)	96	70-130
cis-1,2-Dichloroethene	99	70-130
Tetrahydrofuran	101	70-130
Chloroform	102	70-130
1,1,1-Trichloroethane	105	70-130
Cyclohexane	100	70-130
Carbon Tetrachloride	105	70-130
2,2,4-Trimethylpentane	111	70-130
Benzene	101	70-130
1,2-Dichloroethane	100	70-130
Heptane	99	70-130
Trichloroethene	102	70-130
1,2-Dichloropropane	98	70-130
1,4-Dioxane	96	70-130
Bromodichloromethane	98	70-130
cis-1,3-Dichloropropene	91	70-130
4-Methyl-2-pentanone	84	70-130
Toluene	97	70-130
trans-1,3-Dichloropropene	81	70-130
1,1,2-Trichloroethane	94	70-130
Tetrachloroethene	96	70-130
2-Hexanone	91	70-130

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Client Sample ID: LCS

Lab ID#: 2001664A-07B

EPA METHOD TO-15 GC/MS

File Name:	**14020603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 10:16 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	94	70-130
1,2-Dibromoethane (EDB)	95	70-130
Chlorobenzene	94	70-130
Ethyl Benzene	94	70-130
m,p-Xylene	96	70-130
o-Xylene	93	70-130
Styrene	97	70-130
Bromoform	95	70-130
Cumene	95	70-130
1,1,2,2-Tetrachloroethane	96	70-130
Propylbenzene	95	70-130
4-Ethyltoluene	98	70-130
1,3,5-Trimethylbenzene	99	70-130
1,2,4-Trimethylbenzene	88	70-130
1,3-Dichlorobenzene	97	70-130
1,4-Dichlorobenzene	98	70-130
alpha-Chlorotoluene	83	70-130
1,2-Dichlorobenzene	96	70-130
1,2,4-Trichlorobenzene	90	70-130
Hexachlorobutadiene	98	70-130
Butane	110	60-140
Isopentane	132	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: LCSD

Lab ID#: 2001664A-07BB

EPA METHOD TO-15 GC/MS

File Name:	**14020604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 10:39 AM**	

Compound	%Recovery	Method Limits
Freon 12	102	70-130
Freon 114	104	70-130
Chloromethane	113	70-130
Vinyl Chloride	103	70-130
1,3-Butadiene	109	70-130
Bromomethane	104	70-130
Chloroethane	100	70-130
Freon 11	114	70-130
Ethanol	112	70-130
Freon 113	102	70-130
1,1-Dichloroethene	107	70-130
Acetone	113	70-130
2-Propanol	105	70-130
Carbon Disulfide	101	70-130
3-Chloropropene	100	70-130
Methylene Chloride	111	70-130
Methyl tert-butyl ether	97	70-130
trans-1,2-Dichloroethene	100	70-130
Hexane	110	70-130
1,1-Dichloroethane	105	70-130
2-Butanone (Methyl Ethyl Ketone)	91	70-130
cis-1,2-Dichloroethene	98	70-130
Tetrahydrofuran	102	70-130
Chloroform	102	70-130
1,1,1-Trichloroethane	103	70-130
Cyclohexane	98	70-130
Carbon Tetrachloride	105	70-130
2,2,4-Trimethylpentane	108	70-130
Benzene	98	70-130
1,2-Dichloroethane	96	70-130
Heptane	93	70-130
Trichloroethene	99	70-130
1,2-Dichloropropane	94	70-130
1,4-Dioxane	96	70-130
Bromodichloromethane	96	70-130
cis-1,3-Dichloropropene	96	70-130
4-Methyl-2-pentanone	81	70-130
Toluene	94	70-130
trans-1,3-Dichloropropene	93	70-130
1,1,2-Trichloroethane	90	70-130
Tetrachloroethene	94	70-130
2-Hexanone	93	70-130

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Client Sample ID: LCSD

Lab ID#: 2001664A-07BB

EPA METHOD TO-15 GC/MS

File Name:	**14020604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/6/20 10:39 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	98	70-130
1,2-Dibromoethane (EDB)	97	70-130
Chlorobenzene	94	70-130
Ethyl Benzene	95	70-130
m,p-Xylene	96	70-130
o-Xylene	94	70-130
Styrene	95	70-130
Bromoform	94	70-130
Cumene	94	70-130
1,1,2,2-Tetrachloroethane	97	70-130
Propylbenzene	95	70-130
4-Ethyltoluene	98	70-130
1,3,5-Trimethylbenzene	100	70-130
1,2,4-Trimethylbenzene	90	70-130
1,3-Dichlorobenzene	100	70-130
1,4-Dichlorobenzene	101	70-130
alpha-Chlorotoluene	92	70-130
1,2-Dichlorobenzene	101	70-130
1,2,4-Trichlorobenzene	104	70-130
Hexachlorobutadiene	107	70-130
Butane	109	60-140
Isopentane	129	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	98	70-130

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2/11/2020
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St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60619901-1.04.001
Workorder #: 2001664B

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 1/29/2020 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 #: 2001664B

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. #**	121921
FAX:		**PROJECT #**	60619901-1.04.001 Roxana Quarterly Soil Vapor
DATE RECEIVED:	01/29/2020	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	02/11/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-012820	Modified ASTM D-1946	8.4 "Hg	15.5 psi
02A	VMP-15-21.5-012820	Modified ASTM D-1946	7.8 "Hg	16.2 psi
03A	VMP-15-25.5-012820	Modified ASTM D-1946	6.9 "Hg	16.2 psi
04A	VMP-55-20-012820	Modified ASTM D-1946	9.4 "Hg	15.3 psi
05A	Lab Blank	Modified ASTM D-1946	NA	NA
05B	Lab Blank	Modified ASTM D-1946	NA	NA
06A	LCS	Modified ASTM D-1946	NA	NA
06AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 02/11/20

Technical Director

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

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

LABORATORY NARRATIVE
Modified ASTM D-1946
AECOM
Workorder# 2001664B

Four 1 Liter Summa Canister samples were received on January 29, 2020. 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 EATL 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 requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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

Client Sample ID: VMP-15-5-012820

Lab ID#: 2001664B-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	17
Nitrogen	0.28	82
Carbon Dioxide	0.028	1.4

Client Sample ID: VMP-15-21.5-012820

Lab ID#: 2001664B-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	1.5
Nitrogen	0.28	86
Methane	0.00028	0.25
Carbon Dioxide	0.028	12

Client Sample ID: VMP-15-25.5-012820

Lab ID#: 2001664B-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	1.4
Nitrogen	0.27	80
Methane	0.00027	0.65
Carbon Dioxide	0.027	18
Ethane	0.0027	0.00015 J

Client Sample ID: VMP-55-20-012820

Lab ID#: 2001664B-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.30	2.4
Nitrogen	0.30	76
Methane	0.00030	4.1
Carbon Dioxide	0.030	18
Ethane	0.0030	0.00095 J

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

Client Sample ID: VMP-55-20-012820

Lab ID#: 2001664B-04A

Helium	0.15	0.0090 J

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Client Sample ID: VMP-15-5-012820

Lab ID#: 2001664B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10020409**	**Date of Collection: 1/28/20 8:44:00 AM**	
Dil. Factor:	**2.85**	**Date of Analysis: 2/4/20 03:42 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	17
Nitrogen	0.28	82
Carbon Monoxide	0.028	Not Detected
Methane	0.00028	Not Detected
Carbon Dioxide	0.028	1.4
Ethane	0.0028	Not Detected
Ethene	0.0028	Not Detected
Helium	0.14	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-21.5-012820

Lab ID#: 2001664B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10020410**	**Date of Collection: 1/28/20 8:54:00 AM**	
Dil. Factor:	**2.83**	**Date of Analysis: 2/4/20 04:07 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	1.5
Nitrogen	0.28	86
Carbon Monoxide	0.028	Not Detected
Methane	0.00028	0.25
Carbon Dioxide	0.028	12
Ethane	0.0028	Not Detected
Ethene	0.0028	Not Detected
Helium	0.14	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-25.5-012820

Lab ID#: 2001664B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10020411**	**Date of Collection: 1/28/20 9:08:00 AM**	
Dil. Factor:	**2.73**	**Date of Analysis: 2/4/20 04:38 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	1.4
Nitrogen	0.27	80
Carbon Monoxide	0.027	Not Detected
Methane	0.00027	0.65
Carbon Dioxide	0.027	18
Ethane	0.0027	0.00015 J
Ethene	0.0027	Not Detected
Helium	0.14	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-55-20-012820

Lab ID#: 2001664B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10020412**	**Date of Collection: 1/28/20 9:48:00 AM**	
Dil. Factor:	**2.97**	**Date of Analysis: 2/4/20 05:04 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.30	2.4
Nitrogen	0.30	76
Carbon Monoxide	0.030	Not Detected
Methane	0.00030	4.1
Carbon Dioxide	0.030	18
Ethane	0.0030	0.00095 J
Ethene	0.0030	Not Detected
Helium	0.15	0.0090 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: Lab Blank

Lab ID#: 2001664B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10020404**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/4/20 01:28 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#: 2001664B-05B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10020403c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/4/20 01:04 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#: 2001664B-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10020402**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/4/20 12:18 PM**	

Compound	%Recovery	Method Limits
Oxygen	98	85-115
Nitrogen	100	85-115
Carbon Monoxide	94	85-115
Methane	111	85-115
Carbon Dioxide	99	85-115
Ethane	107	85-115
Ethene	108	85-115
Helium	98	85-115

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 2001664B-06AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10020429**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/5/20 10:38 AM**	

Compound	%Recovery	Method Limits
Oxygen	97	85-115
Nitrogen	100	85-115
Carbon Monoxide	93	85-115
Methane	108	85-115
Carbon Dioxide	98	85-115
Ethane	105	85-115
Ethene	106	85-115
Helium	98	85-115

Container Type: NA - Not Applicable

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5/12/2020
Ms. Elizabeth Kunkel
AECOM
100 N. Broadway, 20th Floor

St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60619901-1.04.002
Workorder #: 2004623A

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 4/29/2020 at Air Toxics Ltd.

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

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: 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 #: 2004623A

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. #**	121921
FAX:		**PROJECT #**	60619901-1.04.002 Roxana Quarterly Soil Vapor
DATE RECEIVED:	04/29/2020	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	05/12/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-042820	TO-15	6.5 "Hg	15.9 psi
02A	VMP-15-21.5-042820	TO-15	8 "Hg	15.6 psi
02B	VMP-15-21.5-042820	TO-15	8 "Hg	15.6 psi
03A	VMP-15-25.5-042820	TO-15	7.1 "Hg	15.6 psi
04A	VMP-55-20-042820	TO-15	8 "Hg	15.3 psi
05A	Lab Blank	TO-15	NA	NA
06A	CCV	TO-15	NA	NA
07A	LCS	TO-15	NA	NA
07AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 05/12/20

Technical Director

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

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

LABORATORY NARRATIVE
EPA Method TO-15
AECOM
Workorder# 2004623A

Four 1 Liter Summa Canister samples were received on April 29, 2020. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

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

Dilution was performed on samples VMP-15-21.5-042820, VMP-15-25.5-042820 and VMP-55-20-042820 due to the presence of high level target species.

Due to high-level target compounds, sample VMP-15-21.5-042820 was analyzed twice. In the "A" fraction, the sample was diluted to bring the highest-level compounds within the calibration range. The "B" fraction is also reported by client request and may be reported with "E" flags indicating the compound exceeds the calibration range. Both runs and associated QC are reported.

Definition of Data Qualifying Flags

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

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

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

a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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

Client Sample ID: VMP-15-5-042820

Lab ID#: 2004623A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	0.41 J	6.6	2.0 J
Acetone	13	3.7 J	32	8.8 J
2-Propanol	5.3	1.2 J	13	3.1 J
cis-1,2-Dichloroethene	1.3	0.63 J	5.3	2.5 J
2,2,4-Trimethylpentane	1.3	0.96 J	6.2	4.5 J
Tetrachloroethene	1.3	24	9.0	160

Client Sample ID: VMP-15-21.5-042820

Lab ID#: 2004623A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	12	5.9 J	24	11 J
Acetone	31	10 J	74	24 J
2-Propanol	12	3.3 J	31	8.0 J
2,2,4-Trimethylpentane	3.1	800	14	3700
Benzene	3.1	0.88 J	10	2.8 J

Client Sample ID: VMP-15-21.5-042820

Lab ID#: 2004623A-02B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	5.6	5.1 J	10	9.6 J
Acetone	14	8.2 J	33	19 J
2-Propanol	5.6	2.6 J	14	6.4 J
2,2,4-Trimethylpentane	1.4	850 E	6.6	4000 E
Benzene	1.4	0.90 J	4.5	2.9 J

Client Sample ID: VMP-15-25.5-042820

Lab ID#: 2004623A-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2,2,4-Trimethylpentane	18	4200	84	20000

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

Client Sample ID: VMP-15-25.5-042820

Lab ID#: 2004623A-03A

Benzene	18	3.3 J	58	10 J
Butane	72	48 J	170	120 J
Isopentane	72	26 J	210	75 J

Client Sample ID: VMP-55-20-042820

Lab ID#: 2004623A-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	70	23 J	160	55 J
Methyl tert-butyl ether	28	8.9 J	100	32 J
2,2,4-Trimethylpentane	7.0	2200	32	10000
Benzene	7.0	1.4 J	22	4.6 J

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Client Sample ID: VMP-15-5-042820

Lab ID#: 2004623A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050723**	**Date of Collection:**	**4/28/20 8:43:00 AM**
Dil. Factor:	**2.66**	**Date of Analysis:**	**5/7/20 10:12 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	0.41 J	6.6	2.0 J
Freon 114	1.3	Not Detected	9.3	Not Detected
Chloromethane	13	Not Detected	27	Not Detected
Vinyl Chloride	1.3	Not Detected	3.4	Not Detected
1,3-Butadiene	1.3	Not Detected	2.9	Not Detected
Bromomethane	13	Not Detected	52	Not Detected
Chloroethane	5.3	Not Detected	14	Not Detected
Freon 11	1.3	Not Detected	7.5	Not Detected
Ethanol	5.3	Not Detected	10	Not Detected
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Acetone	13	3.7 J	32	8.8 J
2-Propanol	5.3	1.2 J	13	3.1 J
Carbon Disulfide	5.3	Not Detected	16	Not Detected
3-Chloropropene	5.3	Not Detected	17	Not Detected
Methylene Chloride	13	Not Detected	46	Not Detected
Methyl tert-butyl ether	5.3	Not Detected	19	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Hexane	1.3	Not Detected	4.7	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.4	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.3	Not Detected	16	Not Detected
cis-1,2-Dichloroethene	1.3	0.63 J	5.3	2.5 J
Tetrahydrofuran	1.3	Not Detected	3.9	Not Detected
Chloroform	1.3	Not Detected	6.5	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.2	Not Detected
Cyclohexane	1.3	Not Detected	4.6	Not Detected
Carbon Tetrachloride	1.3	Not Detected	8.4	Not Detected
2,2,4-Trimethylpentane	1.3	0.96 J	6.2	4.5 J
Benzene	1.3	Not Detected	4.2	Not Detected
1,2-Dichloroethane	1.3	Not Detected	5.4	Not Detected
Heptane	1.3	Not Detected	5.4	Not Detected
Trichloroethene	1.3	Not Detected	7.1	Not Detected
1,2-Dichloropropane	1.3	Not Detected	6.1	Not Detected
1,4-Dioxane	5.3	Not Detected	19	Not Detected
Bromodichloromethane	1.3	Not Detected	8.9	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	6.0	Not Detected
4-Methyl-2-pentanone	1.3	Not Detected	5.4	Not Detected
Toluene	1.3	Not Detected	5.0	Not Detected
trans-1,3-Dichloropropene	1.3	Not Detected	6.0	Not Detected
1,1,2-Trichloroethane	1.3	Not Detected	7.2	Not Detected
Tetrachloroethene	1.3	24	9.0	160
2-Hexanone	5.3	Not Detected	22	Not Detected

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Client Sample ID: VMP-15-5-042820

Lab ID#: 2004623A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050723**	**Date of Collection:**	**4/28/20 8:43:00 AM**
Dil. Factor:	**2.66**	**Date of Analysis:**	**5/7/20 10:12 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	10	Not Detected
Chlorobenzene	1.3	Not Detected	6.1	Not Detected
Ethyl Benzene	1.3	Not Detected	5.8	Not Detected
m,p-Xylene	1.3	Not Detected	5.8	Not Detected
o-Xylene	1.3	Not Detected	5.8	Not Detected
Styrene	1.3	Not Detected	5.7	Not Detected
Bromoform	1.3	Not Detected	14	Not Detected
Cumene	1.3	Not Detected	6.5	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	9.1	Not Detected
Propylbenzene	1.3	Not Detected	6.5	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.5	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.5	Not Detected
1,2,4-Trimethylbenzene	1.3	Not Detected	6.5	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	8.0	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	8.0	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.9	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	8.0	Not Detected
1,2,4-Trichlorobenzene	5.3	Not Detected	39	Not Detected
Hexachlorobutadiene	5.3	Not Detected	57	Not Detected
Butane	5.3	Not Detected	13	Not Detected
Isopentane	5.3	Not Detected	16	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

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

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Client Sample ID: VMP-15-21.5-042820

Lab ID#: 2004623A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050732**	**Date of Collection:**	**4/28/20 8:53:00 AM**
Dil. Factor:	**6.25**	**Date of Analysis:**	**5/8/20 07:40 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	3.1	Not Detected	15	Not Detected
Freon 114	3.1	Not Detected	22	Not Detected
Chloromethane	31	Not Detected	64	Not Detected
Vinyl Chloride	3.1	Not Detected	8.0	Not Detected
1,3-Butadiene	3.1	Not Detected	6.9	Not Detected
Bromomethane	31	Not Detected	120	Not Detected
Chloroethane	12	Not Detected	33	Not Detected
Freon 11	3.1	Not Detected	18	Not Detected
Ethanol	12	5.9 J	24	11 J
Freon 113	3.1	Not Detected	24	Not Detected
1,1-Dichloroethene	3.1	Not Detected	12	Not Detected
Acetone	31	10 J	74	24 J
2-Propanol	12	3.3 J	31	8.0 J
Carbon Disulfide	12	Not Detected	39	Not Detected
3-Chloropropene	12	Not Detected	39	Not Detected
Methylene Chloride	31	Not Detected	110	Not Detected
Methyl tert-butyl ether	12	Not Detected	45	Not Detected
trans-1,2-Dichloroethene	3.1	Not Detected	12	Not Detected
Hexane	3.1	Not Detected	11	Not Detected
1,1-Dichloroethane	3.1	Not Detected	13	Not Detected
2-Butanone (Methyl Ethyl Ketone)	12	Not Detected	37	Not Detected
cis-1,2-Dichloroethene	3.1	Not Detected	12	Not Detected
Tetrahydrofuran	3.1	Not Detected	9.2	Not Detected
Chloroform	3.1	Not Detected	15	Not Detected
1,1,1-Trichloroethane	3.1	Not Detected	17	Not Detected
Cyclohexane	3.1	Not Detected	11	Not Detected
Carbon Tetrachloride	3.1	Not Detected	20	Not Detected
2,2,4-Trimethylpentane	3.1	800	14	3700
Benzene	3.1	0.88 J	10	2.8 J
1,2-Dichloroethane	3.1	Not Detected	13	Not Detected
Heptane	3.1	Not Detected	13	Not Detected
Trichloroethene	3.1	Not Detected	17	Not Detected
1,2-Dichloropropane	3.1	Not Detected	14	Not Detected
1,4-Dioxane	12	Not Detected	45	Not Detected
Bromodichloromethane	3.1	Not Detected	21	Not Detected
cis-1,3-Dichloropropene	3.1	Not Detected	14	Not Detected
4-Methyl-2-pentanone	3.1	Not Detected	13	Not Detected
Toluene	3.1	Not Detected	12	Not Detected
trans-1,3-Dichloropropene	3.1	Not Detected	14	Not Detected
1,1,2-Trichloroethane	3.1	Not Detected	17	Not Detected
Tetrachloroethene	3.1	Not Detected	21	Not Detected
2-Hexanone	12	Not Detected	51	Not Detected

eurofins | Air Toxics

Client Sample ID: VMP-15-21.5-042820

Lab ID#: 2004623A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050732**	**Date of Collection: 4/28/20 8:53:00 AM**	
Dil. Factor:	**6.25**	**Date of Analysis: 5/8/20 07:40 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	3.1	Not Detected	27	Not Detected
1,2-Dibromoethane (EDB)	3.1	Not Detected	24	Not Detected
Chlorobenzene	3.1	Not Detected	14	Not Detected
Ethyl Benzene	3.1	Not Detected	14	Not Detected
m,p-Xylene	3.1	Not Detected	14	Not Detected
o-Xylene	3.1	Not Detected	14	Not Detected
Styrene	3.1	Not Detected	13	Not Detected
Bromoform	3.1	Not Detected	32	Not Detected
Cumene	3.1	Not Detected	15	Not Detected
1,1,2,2-Tetrachloroethane	3.1	Not Detected	21	Not Detected
Propylbenzene	3.1	Not Detected	15	Not Detected
4-Ethyltoluene	3.1	Not Detected	15	Not Detected
1,3,5-Trimethylbenzene	3.1	Not Detected	15	Not Detected
1,2,4-Trimethylbenzene	3.1	Not Detected	15	Not Detected
1,3-Dichlorobenzene	3.1	Not Detected	19	Not Detected
1,4-Dichlorobenzene	3.1	Not Detected	19	Not Detected
alpha-Chlorotoluene	3.1	Not Detected	16	Not Detected
1,2-Dichlorobenzene	3.1	Not Detected	19	Not Detected
1,2,4-Trichlorobenzene	12	Not Detected	93	Not Detected
Hexachlorobutadiene	12	Not Detected	130	Not Detected
Butane	12	Not Detected	30	Not Detected
Isopentane	12	Not Detected	37	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: VMP-15-21.5-042820

Lab ID#: 2004623A-02B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050722**	**Date of Collection:**	**4/28/20 8:53:00 AM**
Dil. Factor:	**2.81**	**Date of Analysis:**	**5/7/20 09:45 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	Not Detected	6.9	Not Detected
Freon 114	1.4	Not Detected	9.8	Not Detected
Chloromethane	14	Not Detected	29	Not Detected
Vinyl Chloride	1.4	Not Detected	3.6	Not Detected
1,3-Butadiene	1.4	Not Detected	3.1	Not Detected
Bromomethane	14	Not Detected	54	Not Detected
Chloroethane	5.6	Not Detected	15	Not Detected
Freon 11	1.4	Not Detected	7.9	Not Detected
Ethanol	5.6	5.1 J	10	9.6 J
Freon 113	1.4	Not Detected	11	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Acetone	14	8.2 J	33	19 J
2-Propanol	5.6	2.6 J	14	6.4 J
Carbon Disulfide	5.6	Not Detected	18	Not Detected
3-Chloropropene	5.6	Not Detected	18	Not Detected
Methylene Chloride	14	Not Detected	49	Not Detected
Methyl tert-butyl ether	5.6	Not Detected	20	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Hexane	1.4	Not Detected	5.0	Not Detected
1,1-Dichloroethane	1.4	Not Detected	5.7	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.6	Not Detected	16	Not Detected
cis-1,2-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Tetrahydrofuran	1.4	Not Detected	4.1	Not Detected
Chloroform	1.4	Not Detected	6.9	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.7	Not Detected
Cyclohexane	1.4	Not Detected	4.8	Not Detected
Carbon Tetrachloride	1.4	Not Detected	8.8	Not Detected
2,2,4-Trimethylpentane	1.4	850 E	6.6	4000 E
Benzene	1.4	0.90 J	4.5	2.9 J
1,2-Dichloroethane	1.4	Not Detected	5.7	Not Detected
Heptane	1.4	Not Detected	5.8	Not Detected
Trichloroethene	1.4	Not Detected	7.6	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.5	Not Detected
1,4-Dioxane	5.6	Not Detected	20	Not Detected
Bromodichloromethane	1.4	Not Detected	9.4	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.4	Not Detected
4-Methyl-2-pentanone	1.4	Not Detected	5.8	Not Detected
Toluene	1.4	Not Detected	5.3	Not Detected
trans-1,3-Dichloropropene	1.4	Not Detected	6.4	Not Detected
1,1,2-Trichloroethane	1.4	Not Detected	7.7	Not Detected
Tetrachloroethene	1.4	Not Detected	9.5	Not Detected
2-Hexanone	5.6	Not Detected	23	Not Detected

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Client Sample ID: VMP-15-21.5-042820

Lab ID#: 2004623A-02B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050722**	**Date of Collection:**	**4/28/20 8:53:00 AM**
Dil. Factor:	**2.81**	**Date of Analysis:**	**5/7/20 09:45 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.5	Not Detected
Ethyl Benzene	1.4	Not Detected	6.1	Not Detected
m,p-Xylene	1.4	Not Detected	6.1	Not Detected
o-Xylene	1.4	Not Detected	6.1	Not Detected
Styrene	1.4	Not Detected	6.0	Not Detected
Bromoform	1.4	Not Detected	14	Not Detected
Cumene	1.4	Not Detected	6.9	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.6	Not Detected
Propylbenzene	1.4	Not Detected	6.9	Not Detected
4-Ethyltoluene	1.4	Not Detected	6.9	Not Detected
1,3,5-Trimethylbenzene	1.4	Not Detected	6.9	Not Detected
1,2,4-Trimethylbenzene	1.4	Not Detected	6.9	Not Detected
1,3-Dichlorobenzene	1.4	Not Detected	8.4	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.4	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.3	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.4	Not Detected
1,2,4-Trichlorobenzene	5.6	Not Detected	42	Not Detected
Hexachlorobutadiene	5.6	Not Detected	60	Not Detected
Butane	5.6	Not Detected	13	Not Detected
Isopentane	5.6	Not Detected	16	Not Detected

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

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: VMP-15-25.5-042820

Lab ID#: 2004623A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050724**	**Date of Collection:**	**4/28/20 9:08:00 AM**
Dil. Factor:	**36.0**	**Date of Analysis:**	**5/7/20 10:36 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	18	Not Detected	89	Not Detected
Freon 114	18	Not Detected	120	Not Detected
Chloromethane	180	Not Detected	370	Not Detected
Vinyl Chloride	18	Not Detected	46	Not Detected
1,3-Butadiene	18	Not Detected	40	Not Detected
Bromomethane	180	Not Detected	700	Not Detected
Chloroethane	72	Not Detected	190	Not Detected
Freon 11	18	Not Detected	100	Not Detected
Ethanol	72	Not Detected	140	Not Detected
Freon 113	18	Not Detected	140	Not Detected
1,1-Dichloroethene	18	Not Detected	71	Not Detected
Acetone	180	Not Detected	430	Not Detected
2-Propanol	72	Not Detected	180	Not Detected
Carbon Disulfide	72	Not Detected	220	Not Detected
3-Chloropropene	72	Not Detected	220	Not Detected
Methylene Chloride	180	Not Detected	620	Not Detected
Methyl tert-butyl ether	72	Not Detected	260	Not Detected
trans-1,2-Dichloroethene	18	Not Detected	71	Not Detected
Hexane	18	Not Detected	63	Not Detected
1,1-Dichloroethane	18	Not Detected	73	Not Detected
2-Butanone (Methyl Ethyl Ketone)	72	Not Detected	210	Not Detected
cis-1,2-Dichloroethene	18	Not Detected	71	Not Detected
Tetrahydrofuran	18	Not Detected	53	Not Detected
Chloroform	18	Not Detected	88	Not Detected
1,1,1-Trichloroethane	18	Not Detected	98	Not Detected
Cyclohexane	18	Not Detected	62	Not Detected
Carbon Tetrachloride	18	Not Detected	110	Not Detected
2,2,4-Trimethylpentane	18	4200	84	20000
Benzene	18	3.3 J	58	10 J
1,2-Dichloroethane	18	Not Detected	73	Not Detected
Heptane	18	Not Detected	74	Not Detected
Trichloroethene	18	Not Detected	97	Not Detected
1,2-Dichloropropane	18	Not Detected	83	Not Detected
1,4-Dioxane	72	Not Detected	260	Not Detected
Bromodichloromethane	18	Not Detected	120	Not Detected
cis-1,3-Dichloropropene	18	Not Detected	82	Not Detected
4-Methyl-2-pentanone	18	Not Detected	74	Not Detected
Toluene	18	Not Detected	68	Not Detected
trans-1,3-Dichloropropene	18	Not Detected	82	Not Detected
1,1,2-Trichloroethane	18	Not Detected	98	Not Detected
Tetrachloroethene	18	Not Detected	120	Not Detected
2-Hexanone	72	Not Detected	290	Not Detected

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Client Sample ID: VMP-15-25.5-042820

Lab ID#: 2004623A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050724**	**Date of Collection: 4/28/20 9:08:00 AM**	
Dil. Factor:	**36.0**	**Date of Analysis: 5/7/20 10:36 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	18	Not Detected	150	Not Detected
1,2-Dibromoethane (EDB)	18	Not Detected	140	Not Detected
Chlorobenzene	18	Not Detected	83	Not Detected
Ethyl Benzene	18	Not Detected	78	Not Detected
m,p-Xylene	18	Not Detected	78	Not Detected
o-Xylene	18	Not Detected	78	Not Detected
Styrene	18	Not Detected	77	Not Detected
Bromoform	18	Not Detected	190	Not Detected
Cumene	18	Not Detected	88	Not Detected
1,1,2,2-Tetrachloroethane	18	Not Detected	120	Not Detected
Propylbenzene	18	Not Detected	88	Not Detected
4-Ethyltoluene	18	Not Detected	88	Not Detected
1,3,5-Trimethylbenzene	18	Not Detected	88	Not Detected
1,2,4-Trimethylbenzene	18	Not Detected	88	Not Detected
1,3-Dichlorobenzene	18	Not Detected	110	Not Detected
1,4-Dichlorobenzene	18	Not Detected	110	Not Detected
alpha-Chlorotoluene	18	Not Detected	93	Not Detected
1,2-Dichlorobenzene	18	Not Detected	110	Not Detected
1,2,4-Trichlorobenzene	72	Not Detected	530	Not Detected
Hexachlorobutadiene	72	Not Detected	770	Not Detected
Butane	72	48 J	170	120 J
Isopentane	72	26 J	210	75 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: VMP-55-20-042820

Lab ID#: 2004623A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050725**	**Date of Collection:**	**4/28/20 9:36:00 AM**
Dil. Factor:	**13.9**	**Date of Analysis:**	**5/7/20 11:00 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	7.0	Not Detected	34	Not Detected
Freon 114	7.0	Not Detected	48	Not Detected
Chloromethane	70	Not Detected	140	Not Detected
Vinyl Chloride	7.0	Not Detected	18	Not Detected
1,3-Butadiene	7.0	Not Detected	15	Not Detected
Bromomethane	70	Not Detected	270	Not Detected
Chloroethane	28	Not Detected	73	Not Detected
Freon 11	7.0	Not Detected	39	Not Detected
Ethanol	28	Not Detected	52	Not Detected
Freon 113	7.0	Not Detected	53	Not Detected
1,1-Dichloroethene	7.0	Not Detected	28	Not Detected
Acetone	70	23 J	160	55 J
2-Propanol	28	Not Detected	68	Not Detected
Carbon Disulfide	28	Not Detected	86	Not Detected
3-Chloropropene	28	Not Detected	87	Not Detected
Methylene Chloride	70	Not Detected	240	Not Detected
Methyl tert-butyl ether	28	8.9 J	100	32 J
trans-1,2-Dichloroethene	7.0	Not Detected	28	Not Detected
Hexane	7.0	Not Detected	24	Not Detected
1,1-Dichloroethane	7.0	Not Detected	28	Not Detected
2-Butanone (Methyl Ethyl Ketone)	28	Not Detected	82	Not Detected
cis-1,2-Dichloroethene	7.0	Not Detected	28	Not Detected
Tetrahydrofuran	7.0	Not Detected	20	Not Detected
Chloroform	7.0	Not Detected	34	Not Detected
1,1,1-Trichloroethane	7.0	Not Detected	38	Not Detected
Cyclohexane	7.0	Not Detected	24	Not Detected
Carbon Tetrachloride	7.0	Not Detected	44	Not Detected
2,2,4-Trimethylpentane	7.0	2200	32	10000
Benzene	7.0	1.4 J	22	4.6 J
1,2-Dichloroethane	7.0	Not Detected	28	Not Detected
Heptane	7.0	Not Detected	28	Not Detected
Trichloroethene	7.0	Not Detected	37	Not Detected
1,2-Dichloropropane	7.0	Not Detected	32	Not Detected
1,4-Dioxane	28	Not Detected	100	Not Detected
Bromodichloromethane	7.0	Not Detected	46	Not Detected
cis-1,3-Dichloropropene	7.0	Not Detected	32	Not Detected
4-Methyl-2-pentanone	7.0	Not Detected	28	Not Detected
Toluene	7.0	Not Detected	26	Not Detected
trans-1,3-Dichloropropene	7.0	Not Detected	32	Not Detected
1,1,2-Trichloroethane	7.0	Not Detected	38	Not Detected
Tetrachloroethene	7.0	Not Detected	47	Not Detected
2-Hexanone	28	Not Detected	110	Not Detected

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Client Sample ID: VMP-55-20-042820

Lab ID#: 2004623A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050725**	**Date of Collection:**	**4/28/20 9:36:00 AM**
Dil. Factor:	**13.9**	**Date of Analysis:**	**5/7/20 11:00 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	7.0	Not Detected	59	Not Detected
1,2-Dibromoethane (EDB)	7.0	Not Detected	53	Not Detected
Chlorobenzene	7.0	Not Detected	32	Not Detected
Ethyl Benzene	7.0	Not Detected	30	Not Detected
m,p-Xylene	7.0	Not Detected	30	Not Detected
o-Xylene	7.0	Not Detected	30	Not Detected
Styrene	7.0	Not Detected	30	Not Detected
Bromoform	7.0	Not Detected	72	Not Detected
Cumene	7.0	Not Detected	34	Not Detected
1,1,2,2-Tetrachloroethane	7.0	Not Detected	48	Not Detected
Propylbenzene	7.0	Not Detected	34	Not Detected
4-Ethyltoluene	7.0	Not Detected	34	Not Detected
1,3,5-Trimethylbenzene	7.0	Not Detected	34	Not Detected
1,2,4-Trimethylbenzene	7.0	Not Detected	34	Not Detected
1,3-Dichlorobenzene	7.0	Not Detected	42	Not Detected
1,4-Dichlorobenzene	7.0	Not Detected	42	Not Detected
alpha-Chlorotoluene	7.0	Not Detected	36	Not Detected
1,2-Dichlorobenzene	7.0	Not Detected	42	Not Detected
1,2,4-Trichlorobenzene	28	Not Detected	210	Not Detected
Hexachlorobutadiene	28	Not Detected	300	Not Detected
Butane	28	Not Detected	66	Not Detected
Isopentane	28	Not Detected	82	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

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

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Client Sample ID: Lab Blank

Lab ID#: 2004623A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050608a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 12:38 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	2.0	Not Detected	7.2	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	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#: 2004623A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050608a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 12:38 PM**	

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

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: CCV

Lab ID#: 2004623A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050702**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 09:07 AM**

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

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Client Sample ID: CCV

Lab ID#: 2004623A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050702**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 09:07 AM**	

Compound	%Recovery
Dibromochloromethane	93
1,2-Dibromoethane (EDB)	94
Chlorobenzene	93
Ethyl Benzene	94
m,p-Xylene	95
o-Xylene	94
Styrene	95
Bromoform	95
Cumene	94
1,1,2,2-Tetrachloroethane	94
Propylbenzene	94
4-Ethyltoluene	95
1,3,5-Trimethylbenzene	95
1,2,4-Trimethylbenzene	94
1,3-Dichlorobenzene	90
1,4-Dichlorobenzene	91
alpha-Chlorotoluene	83
1,2-Dichlorobenzene	92
1,2,4-Trichlorobenzene	90
Hexachlorobutadiene	93
Butane	95
Isopentane	90

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCS

Lab ID#: 2004623A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050703**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 09:31 AM**	

Compound	%Recovery	Method Limits
Freon 12	96	70-130
Freon 114	96	70-130
Chloromethane	97	70-130
Vinyl Chloride	100	70-130
1,3-Butadiene	94	70-130
Bromomethane	102	70-130
Chloroethane	96	70-130
Freon 11	93	70-130
Ethanol	89	70-130
Freon 113	91	70-130
1,1-Dichloroethene	92	70-130
Acetone	93	70-130
2-Propanol	92	70-130
Carbon Disulfide	98	70-130
3-Chloropropene	101	70-130
Methylene Chloride	96	70-130
Methyl tert-butyl ether	92	70-130
trans-1,2-Dichloroethene	107	70-130
Hexane	98	70-130
1,1-Dichloroethane	98	70-130
2-Butanone (Methyl Ethyl Ketone)	103	70-130
cis-1,2-Dichloroethene	93	70-130
Tetrahydrofuran	100	70-130
Chloroform	97	70-130
1,1,1-Trichloroethane	96	70-130
Cyclohexane	99	70-130
Carbon Tetrachloride	95	70-130
2,2,4-Trimethylpentane	106	70-130
Benzene	98	70-130
1,2-Dichloroethane	91	70-130
Heptane	100	70-130
Trichloroethene	97	70-130
1,2-Dichloropropane	101	70-130
1,4-Dioxane	95	70-130
Bromodichloromethane	100	70-130
cis-1,3-Dichloropropene	110	70-130
4-Methyl-2-pentanone	101	70-130
Toluene	99	70-130
trans-1,3-Dichloropropene	100	70-130
1,1,2-Trichloroethane	96	70-130
Tetrachloroethene	93	70-130
2-Hexanone	98	70-130

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Client Sample ID: LCS

Lab ID#: 2004623A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050703**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 09:31 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	97	70-130
1,2-Dibromoethane (EDB)	96	70-130
Chlorobenzene	95	70-130
Ethyl Benzene	97	70-130
m,p-Xylene	98	70-130
o-Xylene	99	70-130
Styrene	100	70-130
Bromoform	101	70-130
Cumene	96	70-130
1,1,2,2-Tetrachloroethane	96	70-130
Propylbenzene	97	70-130
4-Ethyltoluene	100	70-130
1,3,5-Trimethylbenzene	98	70-130
1,2,4-Trimethylbenzene	98	70-130
1,3-Dichlorobenzene	93	70-130
1,4-Dichlorobenzene	92	70-130
alpha-Chlorotoluene	103	70-130
1,2-Dichlorobenzene	92	70-130
1,2,4-Trichlorobenzene	87	70-130
Hexachlorobutadiene	92	70-130
Butane	97	60-140
Isopentane	91	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCSD

Lab ID#: 2004623A-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050704**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 09:56 AM**	

Compound	%Recovery	Method Limits
Freon 12	94	70-130
Freon 114	95	70-130
Chloromethane	96	70-130
Vinyl Chloride	98	70-130
1,3-Butadiene	91	70-130
Bromomethane	102	70-130
Chloroethane	93	70-130
Freon 11	91	70-130
Ethanol	88	70-130
Freon 113	90	70-130
1,1-Dichloroethene	92	70-130
Acetone	92	70-130
2-Propanol	91	70-130
Carbon Disulfide	96	70-130
3-Chloropropene	99	70-130
Methylene Chloride	94	70-130
Methyl tert-butyl ether	92	70-130
trans-1,2-Dichloroethene	105	70-130
Hexane	96	70-130
1,1-Dichloroethane	96	70-130
2-Butanone (Methyl Ethyl Ketone)	102	70-130
cis-1,2-Dichloroethene	92	70-130
Tetrahydrofuran	99	70-130
Chloroform	96	70-130
1,1,1-Trichloroethane	94	70-130
Cyclohexane	98	70-130
Carbon Tetrachloride	93	70-130
2,2,4-Trimethylpentane	104	70-130
Benzene	98	70-130
1,2-Dichloroethane	92	70-130
Heptane	99	70-130
Trichloroethene	98	70-130
1,2-Dichloropropane	101	70-130
1,4-Dioxane	96	70-130
Bromodichloromethane	99	70-130
cis-1,3-Dichloropropene	110	70-130
4-Methyl-2-pentanone	101	70-130
Toluene	98	70-130
trans-1,3-Dichloropropene	100	70-130
1,1,2-Trichloroethane	97	70-130
Tetrachloroethene	92	70-130
2-Hexanone	98	70-130

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Client Sample ID: LCSD

Lab ID#: 2004623A-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a050704**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 09:56 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	96	70-130
1,2-Dibromoethane (EDB)	96	70-130
Chlorobenzene	94	70-130
Ethyl Benzene	96	70-130
m,p-Xylene	98	70-130
o-Xylene	98	70-130
Styrene	98	70-130
Bromoform	99	70-130
Cumene	95	70-130
1,1,2,2-Tetrachloroethane	96	70-130
Propylbenzene	97	70-130
4-Ethyltoluene	96	70-130
1,3,5-Trimethylbenzene	100	70-130
1,2,4-Trimethylbenzene	97	70-130
1,3-Dichlorobenzene	92	70-130
1,4-Dichlorobenzene	93	70-130
alpha-Chlorotoluene	103	70-130
1,2-Dichlorobenzene	92	70-130
1,2,4-Trichlorobenzene	89	70-130
Hexachlorobutadiene	93	70-130
Butane	94	60-140
Isopentane	90	60-140

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	100	70-130

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5/12/2020
Ms. Elizabeth Kunkel
AECOM
100 N. Broadway, 20th Floor

St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60619901-1.04.002
Workorder #: 2004623B

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 4/29/2020 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 #: 2004623B

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. #**	121921
FAX:		**PROJECT #**	60619901-1.04.002 Roxana Quarterly Soil Vapor
DATE RECEIVED:	04/29/2020	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	05/12/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-042820	Modified ASTM D-1946	6.5 "Hg	15.9 psi
02A	VMP-15-21.5-042820	Modified ASTM D-1946	8 "Hg	15.6 psi
03A	VMP-15-25.5-042820	Modified ASTM D-1946	7.1 "Hg	15.6 psi
04A	VMP-55-20-042820	Modified ASTM D-1946	8 "Hg	15.3 psi
05A	Lab Blank	Modified ASTM D-1946	NA	NA
05B	Lab Blank	Modified ASTM D-1946	NA	NA
06A	LCS	Modified ASTM D-1946	NA	NA
06AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 05/12/20

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209219, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-19-14, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-013, Effective date: 10/18/2019, Expiration date: 10/17/2020.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

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

LABORATORY NARRATIVE
Modified ASTM D-1946
AECOM
Workorder# 2004623B

Four 1 Liter Summa Canister samples were received on April 29, 2020. 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 EATL 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 requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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

Client Sample ID: VMP-15-5-042820

Lab ID#: 2004623B-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	18
Nitrogen	0.27	81
Carbon Dioxide	0.027	1.4

Client Sample ID: VMP-15-21.5-042820

Lab ID#: 2004623B-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	1.7
Nitrogen	0.28	80
Methane	0.00028	3.3
Carbon Dioxide	0.028	15
Helium	0.14	0.015 J

Client Sample ID: VMP-15-25.5-042820

Lab ID#: 2004623B-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	1.3
Nitrogen	0.27	76
Methane	0.00027	3.3
Carbon Dioxide	0.027	19
Ethane	0.0027	0.00077 J

Client Sample ID: VMP-55-20-042820

Lab ID#: 2004623B-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	4.8
Nitrogen	0.28	78
Methane	0.00028	0.072
Carbon Dioxide	0.028	17

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

Client Sample ID: VMP-55-20-042820

Lab ID#: 2004623B-04A

Helium	0.14	0.011 J

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Client Sample ID: VMP-15-5-042820

Lab ID#: 2004623B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10050715**	**Date of Collection: 4/28/20 8:43:00 AM**	
Dil. Factor:	**2.66**	**Date of Analysis: 5/7/20 05:39 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	18
Nitrogen	0.27	81
Carbon Monoxide	0.027	Not Detected
Methane	0.00027	Not Detected
Carbon Dioxide	0.027	1.4
Ethane	0.0027	Not Detected
Ethene	0.0027	Not Detected
Helium	0.13	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-21.5-042820

Lab ID#: 2004623B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10050716**	**Date of Collection: 4/28/20 8:53:00 AM**	
Dil. Factor:	**2.80**	**Date of Analysis: 5/7/20 06:00 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	1.7
Nitrogen	0.28	80
Carbon Monoxide	0.028	Not Detected
Methane	0.00028	3.3
Carbon Dioxide	0.028	15
Ethane	0.0028	Not Detected
Ethene	0.0028	Not Detected
Helium	0.14	0.015 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-25.5-042820

Lab ID#: 2004623B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10050717**	**Date of Collection: 4/28/20 9:08:00 AM**	
Dil. Factor:	**2.70**	**Date of Analysis: 5/7/20 06:22 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	1.3
Nitrogen	0.27	76
Carbon Monoxide	0.027	Not Detected
Methane	0.00027	3.3
Carbon Dioxide	0.027	19
Ethane	0.0027	0.00077 J
Ethene	0.0027	Not Detected
Helium	0.14	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-55-20-042820

Lab ID#: 2004623B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10050718**	**Date of Collection:**	**4/28/20 9:36:00 AM**
Dil. Factor:	**2.78**	**Date of Analysis:**	**5/7/20 06:43 PM**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	4.8
Nitrogen	0.28	78
Carbon Monoxide	0.028	Not Detected
Methane	0.00028	0.072
Carbon Dioxide	0.028	17
Ethane	0.0028	Not Detected
Ethene	0.0028	Not Detected
Helium	0.14	0.011 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: Lab Blank

Lab ID#: 2004623B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10050704**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 01:18 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#: 2004623B-05B

VAPOR ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10050703c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 12:31 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#: 2004623B-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10050702**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 12:07 PM**	

Compound	%Recovery	Method Limits
Oxygen	98	85-115
Nitrogen	97	85-115
Carbon Monoxide	95	85-115
Methane	108	85-115
Carbon Dioxide	105	85-115
Ethane	104	85-115
Ethene	105	85-115
Helium	100	85-115

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 2004623B-06AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10050725**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/7/20 09:37 PM**	

Compound	%Recovery	Method Limits
Oxygen	98	85-115
Nitrogen	97	85-115
Carbon Monoxide	95	85-115
Methane	104	85-115
Carbon Dioxide	104	85-115
Ethane	101	85-115
Ethene	102	85-115
Helium	100	85-115

Container Type: NA - Not Applicable

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8/10/2020
Ms. Elizabeth Kunkel
AECOM
100 N. Broadway, 20th Floor

St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60619901-1.04.003
Workorder #: 2007772A

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 7/29/2020 at Air Toxics Ltd.

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

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: 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 #: 2007772A

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. #**	121921
FAX:		**PROJECT #**	60619901-1.04.003 Roxana Quarterly Soil Vapor
DATE RECEIVED:	07/29/2020	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	08/10/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-072820	TO-15	8.5 "Hg	15 psi
02A	VMP-15-21.5-072820	TO-15	7.5 "Hg	15 psi
03A	VMP-15-21.5-072820-DUP	TO-15	7.0 "Hg	15 psi
04A	VMP-55-20-072820	TO-15	9.0 "Hg	15 psi
05A	Lab Blank	TO-15	NA	NA
06A	CCV	TO-15	NA	NA
07A	LCS	TO-15	NA	NA
07AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 08/10/20

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209219, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-19-14, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-013, Effective date: 10/18/2019, Expiration date: 10/17/2020.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

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

LABORATORY NARRATIVE
EPA Method TO-15
AECOM
Workorder# 2007772A

Four 1 Liter Summa Canister samples were received on July 29, 2020. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

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

Dilution was performed on samples VMP-15-21.5-072820 and VMP-15-21.5-072820-DUP due to the presence of high level target species.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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

Client Sample ID: VMP-15-5-072820

Lab ID#: 2007772A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	0.76 J	7.0	3.8 J
Freon 11	1.4	0.36 J	7.9	2.0 J
Ethanol	5.6	31	11	59
Acetone	14	11 J	33	26 J
2-Propanol	5.6	4.8 J	14	12 J

Client Sample ID: VMP-15-21.5-072820

Lab ID#: 2007772A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2,2,4-Trimethylpentane	13	4200	63	20000

Client Sample ID: VMP-15-21.5-072820-DUP

Lab ID#: 2007772A-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
2,2,4-Trimethylpentane	13	4900	62	23000
Butane	53	38 J	120	90 J

Client Sample ID: VMP-55-20-072820

Lab ID#: 2007772A-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	14	19	34	45
2-Propanol	5.8	4.5 J	14	11 J
Carbon Disulfide	5.8	0.67 J	18	2.1 J
Methyl tert-butyl ether	5.8	11	21	40
2-Butanone (Methyl Ethyl Ketone)	5.8	1.2 J	17	3.6 J
2,2,4-Trimethylpentane	1.4	26	6.8	120
Benzene	1.4	0.47 J	4.6	1.5 J
Propylbenzene	1.4	0.32 J	7.1	1.6 J
Isopentane	5.8	4.7 J	17	14 J

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Client Sample ID: VMP-15-5-072820

Lab ID#: 2007772A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080408**	**Date of Collection:**	**7/28/20 8:47:00 AM**
Dil. Factor:	**2.82**	**Date of Analysis:**	**8/4/20 02:19 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	0.76 J	7.0	3.8 J
Freon 114	1.4	Not Detected	9.8	Not Detected
Chloromethane	14	Not Detected	29	Not Detected
Vinyl Chloride	1.4	Not Detected	3.6	Not Detected
1,3-Butadiene	1.4	Not Detected	3.1	Not Detected
Bromomethane	14	Not Detected	55	Not Detected
Chloroethane	5.6	Not Detected	15	Not Detected
Freon 11	1.4	0.36 J	7.9	2.0 J
Ethanol	5.6	31	11	59
Freon 113	1.4	Not Detected	11	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Acetone	14	11 J	33	26 J
2-Propanol	5.6	4.8 J	14	12 J
Carbon Disulfide	5.6	Not Detected	18	Not Detected
3-Chloropropene	5.6	Not Detected	18	Not Detected
Methylene Chloride	14	Not Detected	49	Not Detected
Methyl tert-butyl ether	5.6	Not Detected	20	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Hexane	1.4	Not Detected	5.0	Not Detected
1,1-Dichloroethane	1.4	Not Detected	5.7	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.6	Not Detected	17	Not Detected
cis-1,2-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Tetrahydrofuran	1.4	Not Detected	4.2	Not Detected
Chloroform	1.4	Not Detected	6.9	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.7	Not Detected
Cyclohexane	1.4	Not Detected	4.8	Not Detected
Carbon Tetrachloride	1.4	Not Detected	8.9	Not Detected
2,2,4-Trimethylpentane	1.4	Not Detected	6.6	Not Detected
Benzene	1.4	Not Detected	4.5	Not Detected
1,2-Dichloroethane	1.4	Not Detected	5.7	Not Detected
Heptane	1.4	Not Detected	5.8	Not Detected
Trichloroethene	1.4	Not Detected	7.6	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.5	Not Detected
1,4-Dioxane	5.6	Not Detected	20	Not Detected
Bromodichloromethane	1.4	Not Detected	9.4	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.4	Not Detected
4-Methyl-2-pentanone	1.4	Not Detected	5.8	Not Detected
Toluene	1.4	Not Detected	5.3	Not Detected
trans-1,3-Dichloropropene	1.4	Not Detected	6.4	Not Detected
1,1,2-Trichloroethane	1.4	Not Detected	7.7	Not Detected
Tetrachloroethene	1.4	Not Detected	9.6	Not Detected
2-Hexanone	5.6	Not Detected	23	Not Detected

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Client Sample ID: VMP-15-5-072820

Lab ID#: 2007772A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080408**	**Date of Collection:**	**7/28/20 8:47:00 AM**
Dil. Factor:	**2.82**	**Date of Analysis:**	**8/4/20 02:19 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.5	Not Detected
Ethyl Benzene	1.4	Not Detected	6.1	Not Detected
m,p-Xylene	1.4	Not Detected	6.1	Not Detected
o-Xylene	1.4	Not Detected	6.1	Not Detected
Styrene	1.4	Not Detected	6.0	Not Detected
Bromoform	1.4	Not Detected	14	Not Detected
Cumene	1.4	Not Detected	6.9	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.7	Not Detected
Propylbenzene	1.4	Not Detected	6.9	Not Detected
4-Ethyltoluene	1.4	Not Detected	6.9	Not Detected
1,3,5-Trimethylbenzene	1.4	Not Detected	6.9	Not Detected
1,2,4-Trimethylbenzene	1.4	Not Detected	6.9	Not Detected
1,3-Dichlorobenzene	1.4	Not Detected	8.5	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.5	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.3	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.5	Not Detected
1,2,4-Trichlorobenzene	5.6	Not Detected	42	Not Detected
Hexachlorobutadiene	5.6	Not Detected	60	Not Detected
Butane	5.6	Not Detected	13	Not Detected
Isopentane	5.6	Not Detected	17	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	111	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: VMP-15-21.5-072820

Lab ID#: 2007772A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080410**	**Date of Collection:**	**7/28/20 9:09:00 AM**
Dil. Factor:	**26.9**	**Date of Analysis:**	**8/4/20 03:10 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	13	Not Detected	66	Not Detected
Freon 114	13	Not Detected	94	Not Detected
Chloromethane	130	Not Detected	280	Not Detected
Vinyl Chloride	13	Not Detected	34	Not Detected
1,3-Butadiene	13	Not Detected	30	Not Detected
Bromomethane	130	Not Detected	520	Not Detected
Chloroethane	54	Not Detected	140	Not Detected
Freon 11	13	Not Detected	76	Not Detected
Ethanol	54	Not Detected	100	Not Detected
Freon 113	13	Not Detected	100	Not Detected
1,1-Dichloroethene	13	Not Detected	53	Not Detected
Acetone	130	Not Detected	320	Not Detected
2-Propanol	54	Not Detected	130	Not Detected
Carbon Disulfide	54	Not Detected	170	Not Detected
3-Chloropropene	54	Not Detected	170	Not Detected
Methylene Chloride	130	Not Detected	470	Not Detected
Methyl tert-butyl ether	54	Not Detected	190	Not Detected
trans-1,2-Dichloroethene	13	Not Detected	53	Not Detected
Hexane	13	Not Detected	47	Not Detected
1,1-Dichloroethane	13	Not Detected	54	Not Detected
2-Butanone (Methyl Ethyl Ketone)	54	Not Detected	160	Not Detected
cis-1,2-Dichloroethene	13	Not Detected	53	Not Detected
Tetrahydrofuran	13	Not Detected	40	Not Detected
Chloroform	13	Not Detected	66	Not Detected
1,1,1-Trichloroethane	13	Not Detected	73	Not Detected
Cyclohexane	13	Not Detected	46	Not Detected
Carbon Tetrachloride	13	Not Detected	85	Not Detected
2,2,4-Trimethylpentane	13	4200	63	20000
Benzene	13	Not Detected	43	Not Detected
1,2-Dichloroethane	13	Not Detected	54	Not Detected
Heptane	13	Not Detected	55	Not Detected
Trichloroethene	13	Not Detected	72	Not Detected
1,2-Dichloropropane	13	Not Detected	62	Not Detected
1,4-Dioxane	54	Not Detected	190	Not Detected
Bromodichloromethane	13	Not Detected	90	Not Detected
cis-1,3-Dichloropropene	13	Not Detected	61	Not Detected
4-Methyl-2-pentanone	13	Not Detected	55	Not Detected
Toluene	13	Not Detected	51	Not Detected
trans-1,3-Dichloropropene	13	Not Detected	61	Not Detected
1,1,2-Trichloroethane	13	Not Detected	73	Not Detected
Tetrachloroethene	13	Not Detected	91	Not Detected
2-Hexanone	54	Not Detected	220	Not Detected

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Client Sample ID: VMP-15-21.5-072820

Lab ID#: 2007772A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080410**	**Date of Collection: 7/28/20 9:09:00 AM**	
Dil. Factor:	**26.9**	**Date of Analysis: 8/4/20 03:10 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	13	Not Detected	110	Not Detected
1,2-Dibromoethane (EDB)	13	Not Detected	100	Not Detected
Chlorobenzene	13	Not Detected	62	Not Detected
Ethyl Benzene	13	Not Detected	58	Not Detected
m,p-Xylene	13	Not Detected	58	Not Detected
o-Xylene	13	Not Detected	58	Not Detected
Styrene	13	Not Detected	57	Not Detected
Bromoform	13	Not Detected	140	Not Detected
Cumene	13	Not Detected	66	Not Detected
1,1,2,2-Tetrachloroethane	13	Not Detected	92	Not Detected
Propylbenzene	13	Not Detected	66	Not Detected
4-Ethyltoluene	13	Not Detected	66	Not Detected
1,3,5-Trimethylbenzene	13	Not Detected	66	Not Detected
1,2,4-Trimethylbenzene	13	Not Detected	66	Not Detected
1,3-Dichlorobenzene	13	Not Detected	81	Not Detected
1,4-Dichlorobenzene	13	Not Detected	81	Not Detected
alpha-Chlorotoluene	13	Not Detected	70	Not Detected
1,2-Dichlorobenzene	13	Not Detected	81	Not Detected
1,2,4-Trichlorobenzene	54	Not Detected	400	Not Detected
Hexachlorobutadiene	54	Not Detected	570	Not Detected
Butane	54	Not Detected	130	Not Detected
Isopentane	54	Not Detected	160	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	107	70-130
1,2-Dichloroethane-d4	122	70-130
4-Bromofluorobenzene	92	70-130

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Client Sample ID: VMP-15-21.5-072820-DUP

Lab ID#: 2007772A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080411**	**Date of Collection:**	**7/28/20 9:09:00 AM**
Dil. Factor:	**26.4**	**Date of Analysis:**	**8/4/20 03:34 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	13	Not Detected	65	Not Detected
Freon 114	13	Not Detected	92	Not Detected
Chloromethane	130	Not Detected	270	Not Detected
Vinyl Chloride	13	Not Detected	34	Not Detected
1,3-Butadiene	13	Not Detected	29	Not Detected
Bromomethane	130	Not Detected	510	Not Detected
Chloroethane	53	Not Detected	140	Not Detected
Freon 11	13	Not Detected	74	Not Detected
Ethanol	53	Not Detected	99	Not Detected
Freon 113	13	Not Detected	100	Not Detected
1,1-Dichloroethene	13	Not Detected	52	Not Detected
Acetone	130	Not Detected	310	Not Detected
2-Propanol	53	Not Detected	130	Not Detected
Carbon Disulfide	53	Not Detected	160	Not Detected
3-Chloropropene	53	Not Detected	160	Not Detected
Methylene Chloride	130	Not Detected	460	Not Detected
Methyl tert-butyl ether	53	Not Detected	190	Not Detected
trans-1,2-Dichloroethene	13	Not Detected	52	Not Detected
Hexane	13	Not Detected	46	Not Detected
1,1-Dichloroethane	13	Not Detected	53	Not Detected
2-Butanone (Methyl Ethyl Ketone)	53	Not Detected	160	Not Detected
cis-1,2-Dichloroethene	13	Not Detected	52	Not Detected
Tetrahydrofuran	13	Not Detected	39	Not Detected
Chloroform	13	Not Detected	64	Not Detected
1,1,1-Trichloroethane	13	Not Detected	72	Not Detected
Cyclohexane	13	Not Detected	45	Not Detected
Carbon Tetrachloride	13	Not Detected	83	Not Detected
2,2,4-Trimethylpentane	13	4900	62	23000
Benzene	13	Not Detected	42	Not Detected
1,2-Dichloroethane	13	Not Detected	53	Not Detected
Heptane	13	Not Detected	54	Not Detected
Trichloroethene	13	Not Detected	71	Not Detected
1,2-Dichloropropane	13	Not Detected	61	Not Detected
1,4-Dioxane	53	Not Detected	190	Not Detected
Bromodichloromethane	13	Not Detected	88	Not Detected
cis-1,3-Dichloropropene	13	Not Detected	60	Not Detected
4-Methyl-2-pentanone	13	Not Detected	54	Not Detected
Toluene	13	Not Detected	50	Not Detected
trans-1,3-Dichloropropene	13	Not Detected	60	Not Detected
1,1,2-Trichloroethane	13	Not Detected	72	Not Detected
Tetrachloroethene	13	Not Detected	90	Not Detected
2-Hexanone	53	Not Detected	220	Not Detected

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Client Sample ID: VMP-15-21.5-072820-DUP

Lab ID#: 2007772A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080411**	**Date of Collection: 7/28/20 9:09:00 AM**	
Dil. Factor:	**26.4**	**Date of Analysis: 8/4/20 03:34 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	13	Not Detected	110	Not Detected
1,2-Dibromoethane (EDB)	13	Not Detected	100	Not Detected
Chlorobenzene	13	Not Detected	61	Not Detected
Ethyl Benzene	13	Not Detected	57	Not Detected
m,p-Xylene	13	Not Detected	57	Not Detected
o-Xylene	13	Not Detected	57	Not Detected
Styrene	13	Not Detected	56	Not Detected
Bromoform	13	Not Detected	140	Not Detected
Cumene	13	Not Detected	65	Not Detected
1,1,2,2-Tetrachloroethane	13	Not Detected	91	Not Detected
Propylbenzene	13	Not Detected	65	Not Detected
4-Ethyltoluene	13	Not Detected	65	Not Detected
1,3,5-Trimethylbenzene	13	Not Detected	65	Not Detected
1,2,4-Trimethylbenzene	13	Not Detected	65	Not Detected
1,3-Dichlorobenzene	13	Not Detected	79	Not Detected
1,4-Dichlorobenzene	13	Not Detected	79	Not Detected
alpha-Chlorotoluene	13	Not Detected	68	Not Detected
1,2-Dichlorobenzene	13	Not Detected	79	Not Detected
1,2,4-Trichlorobenzene	53	Not Detected	390	Not Detected
Hexachlorobutadiene	53	Not Detected	560	Not Detected
Butane	53	38 J	120	90 J
Isopentane	53	Not Detected	160	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	107	70-130
1,2-Dichloroethane-d4	115	70-130
4-Bromofluorobenzene	91	70-130

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Client Sample ID: VMP-55-20-072820

Lab ID#: 2007772A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080409**	**Date of Collection:**	**7/28/20 9:46:00 AM**
Dil. Factor:	**2.89**	**Date of Analysis:**	**8/4/20 02:45 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.4	Not Detected	7.1	Not Detected
Freon 114	1.4	Not Detected	10	Not Detected
Chloromethane	14	Not Detected	30	Not Detected
Vinyl Chloride	1.4	Not Detected	3.7	Not Detected
1,3-Butadiene	1.4	Not Detected	3.2	Not Detected
Bromomethane	14	Not Detected	56	Not Detected
Chloroethane	5.8	Not Detected	15	Not Detected
Freon 11	1.4	Not Detected	8.1	Not Detected
Ethanol	5.8	Not Detected	11	Not Detected
Freon 113	1.4	Not Detected	11	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.7	Not Detected
Acetone	14	19	34	45
2-Propanol	5.8	4.5 J	14	11 J
Carbon Disulfide	5.8	0.67 J	18	2.1 J
3-Chloropropene	5.8	Not Detected	18	Not Detected
Methylene Chloride	14	Not Detected	50	Not Detected
Methyl tert-butyl ether	5.8	11	21	40
trans-1,2-Dichloroethene	1.4	Not Detected	5.7	Not Detected
Hexane	1.4	Not Detected	5.1	Not Detected
1,1-Dichloroethane	1.4	Not Detected	5.8	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.8	1.2 J	17	3.6 J
cis-1,2-Dichloroethene	1.4	Not Detected	5.7	Not Detected
Tetrahydrofuran	1.4	Not Detected	4.3	Not Detected
Chloroform	1.4	Not Detected	7.0	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.9	Not Detected
Cyclohexane	1.4	Not Detected	5.0	Not Detected
Carbon Tetrachloride	1.4	Not Detected	9.1	Not Detected
2,2,4-Trimethylpentane	1.4	26	6.8	120
Benzene	1.4	0.47 J	4.6	1.5 J
1,2-Dichloroethane	1.4	Not Detected	5.8	Not Detected
Heptane	1.4	Not Detected	5.9	Not Detected
Trichloroethene	1.4	Not Detected	7.8	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.7	Not Detected
1,4-Dioxane	5.8	Not Detected	21	Not Detected
Bromodichloromethane	1.4	Not Detected	9.7	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.6	Not Detected
4-Methyl-2-pentanone	1.4	Not Detected	5.9	Not Detected
Toluene	1.4	Not Detected	5.4	Not Detected
trans-1,3-Dichloropropene	1.4	Not Detected	6.6	Not Detected
1,1,2-Trichloroethane	1.4	Not Detected	7.9	Not Detected
Tetrachloroethene	1.4	Not Detected	9.8	Not Detected
2-Hexanone	5.8	Not Detected	24	Not Detected

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Client Sample ID: VMP-55-20-072820

Lab ID#: 2007772A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080409**	**Date of Collection:**	**7/28/20 9:46:00 AM**
Dil. Factor:	**2.89**	**Date of Analysis:**	**8/4/20 02:45 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.6	Not Detected
Ethyl Benzene	1.4	Not Detected	6.3	Not Detected
m,p-Xylene	1.4	Not Detected	6.3	Not Detected
o-Xylene	1.4	Not Detected	6.3	Not Detected
Styrene	1.4	Not Detected	6.2	Not Detected
Bromoform	1.4	Not Detected	15	Not Detected
Cumene	1.4	Not Detected	7.1	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.9	Not Detected
Propylbenzene	1.4	0.32 J	7.1	1.6 J
4-Ethyltoluene	1.4	Not Detected	7.1	Not Detected
1,3,5-Trimethylbenzene	1.4	Not Detected	7.1	Not Detected
1,2,4-Trimethylbenzene	1.4	Not Detected	7.1	Not Detected
1,3-Dichlorobenzene	1.4	Not Detected	8.7	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.7	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.5	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.7	Not Detected
1,2,4-Trichlorobenzene	5.8	Not Detected	43	Not Detected
Hexachlorobutadiene	5.8	Not Detected	62	Not Detected
Butane	5.8	Not Detected	14	Not Detected
Isopentane	5.8	4.7 J	17	14 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	109	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2007772A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080405a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/20 10:25 AM**	

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

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Client Sample ID: Lab Blank

Lab ID#: 2007772A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080405a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/20 10:25 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	0.094 J	2.2	0.41 J
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	103	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	91	70-130

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Client Sample ID: CCV

Lab ID#: 2007772A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080402**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/20 09:07 AM**

Compound	%Recovery
Freon 12	108
Freon 114	104
Chloromethane	114
Vinyl Chloride	107
1,3-Butadiene	103
Bromomethane	112
Chloroethane	105
Freon 11	110
Ethanol	86
Freon 113	96
1,1-Dichloroethene	109
Acetone	108
2-Propanol	96
Carbon Disulfide	109
3-Chloropropene	106
Methylene Chloride	112
Methyl tert-butyl ether	105
trans-1,2-Dichloroethene	107
Hexane	106
1,1-Dichloroethane	110
2-Butanone (Methyl Ethyl Ketone)	104
cis-1,2-Dichloroethene	110
Tetrahydrofuran	104
Chloroform	109
1,1,1-Trichloroethane	104
Cyclohexane	104
Carbon Tetrachloride	106
2,2,4-Trimethylpentane	111
Benzene	105
1,2-Dichloroethane	108
Heptane	103
Trichloroethene	103
1,2-Dichloropropane	102
1,4-Dioxane	90
Bromodichloromethane	106
cis-1,3-Dichloropropene	103
4-Methyl-2-pentanone	90
Toluene	96
trans-1,3-Dichloropropene	105
1,1,2-Trichloroethane	100
Tetrachloroethene	90
2-Hexanone	87

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Client Sample ID: CCV

Lab ID#: 2007772A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080402**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/20 09:07 AM**	

Compound	%Recovery
Dibromochloromethane	99
1,2-Dibromoethane (EDB)	101
Chlorobenzene	99
Ethyl Benzene	100
m,p-Xylene	99
o-Xylene	97
Styrene	106
Bromoform	100
Cumene	101
1,1,2,2-Tetrachloroethane	100
Propylbenzene	100
4-Ethyltoluene	100
1,3,5-Trimethylbenzene	98
1,2,4-Trimethylbenzene	98
1,3-Dichlorobenzene	96
1,4-Dichlorobenzene	94
alpha-Chlorotoluene	97
1,2-Dichlorobenzene	94
1,2,4-Trichlorobenzene	96
Hexachlorobutadiene	96
Butane	112
Isopentane	107

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: LCS

Lab ID#: 2007772A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080403**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/20 09:32 AM**	

Compound	%Recovery	Method Limits
Freon 12	99	70-130
Freon 114	95	70-130
Chloromethane	105	70-130
Vinyl Chloride	100	70-130
1,3-Butadiene	87	70-130
Bromomethane	104	70-130
Chloroethane	98	70-130
Freon 11	100	70-130
Ethanol	86	70-130
Freon 113	89	70-130
1,1-Dichloroethene	98	70-130
Acetone	91	70-130
2-Propanol	95	70-130
Carbon Disulfide	100	70-130
3-Chloropropene	98	70-130
Methylene Chloride	100	70-130
Methyl tert-butyl ether	94	70-130
trans-1,2-Dichloroethene	105	70-130
Hexane	98	70-130
1,1-Dichloroethane	100	70-130
2-Butanone (Methyl Ethyl Ketone)	97	70-130
cis-1,2-Dichloroethene	91	70-130
Tetrahydrofuran	93	70-130
Chloroform	98	70-130
1,1,1-Trichloroethane	98	70-130
Cyclohexane	95	70-130
Carbon Tetrachloride	99	70-130
2,2,4-Trimethylpentane	101	70-130
Benzene	98	70-130
1,2-Dichloroethane	98	70-130
Heptane	104	70-130
Trichloroethene	97	70-130
1,2-Dichloropropane	98	70-130
1,4-Dioxane	96	70-130
Bromodichloromethane	100	70-130
cis-1,3-Dichloropropene	104	70-130
4-Methyl-2-pentanone	96	70-130
Toluene	92	70-130
trans-1,3-Dichloropropene	99	70-130
1,1,2-Trichloroethane	96	70-130
Tetrachloroethene	84	70-130
2-Hexanone	102	70-130

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Client Sample ID: LCS

Lab ID#: 2007772A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080403**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/20 09:32 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	94	70-130
1,2-Dibromoethane (EDB)	95	70-130
Chlorobenzene	96	70-130
Ethyl Benzene	98	70-130
m,p-Xylene	96	70-130
o-Xylene	96	70-130
Styrene	108	70-130
Bromoform	99	70-130
Cumene	96	70-130
1,1,2,2-Tetrachloroethane	96	70-130
Propylbenzene	98	70-130
4-Ethyltoluene	93	70-130
1,3,5-Trimethylbenzene	100	70-130
1,2,4-Trimethylbenzene	96	70-130
1,3-Dichlorobenzene	92	70-130
1,4-Dichlorobenzene	92	70-130
alpha-Chlorotoluene	114	70-130
1,2-Dichlorobenzene	91	70-130
1,2,4-Trichlorobenzene	96	70-130
Hexachlorobutadiene	95	70-130
Butane	97	70-130
Isopentane	96	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCSD

Lab ID#: 2007772A-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080404**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/20 09:58 AM**	

Compound	%Recovery	Method Limits
Freon 12	91	70-130
Freon 114	88	70-130
Chloromethane	97	70-130
Vinyl Chloride	90	70-130
1,3-Butadiene	86	70-130
Bromomethane	97	70-130
Chloroethane	90	70-130
Freon 11	90	70-130
Ethanol	76	70-130
Freon 113	81	70-130
1,1-Dichloroethene	90	70-130
Acetone	81	70-130
2-Propanol	87	70-130
Carbon Disulfide	94	70-130
3-Chloropropene	88	70-130
Methylene Chloride	92	70-130
Methyl tert-butyl ether	88	70-130
trans-1,2-Dichloroethene	97	70-130
Hexane	91	70-130
1,1-Dichloroethane	90	70-130
2-Butanone (Methyl Ethyl Ketone)	89	70-130
cis-1,2-Dichloroethene	85	70-130
Tetrahydrofuran	87	70-130
Chloroform	90	70-130
1,1,1-Trichloroethane	90	70-130
Cyclohexane	89	70-130
Carbon Tetrachloride	91	70-130
2,2,4-Trimethylpentane	93	70-130
Benzene	89	70-130
1,2-Dichloroethane	89	70-130
Heptane	92	70-130
Trichloroethene	87	70-130
1,2-Dichloropropane	88	70-130
1,4-Dioxane	86	70-130
Bromodichloromethane	92	70-130
cis-1,3-Dichloropropene	95	70-130
4-Methyl-2-pentanone	87	70-130
Toluene	83	70-130
trans-1,3-Dichloropropene	89	70-130
1,1,2-Trichloroethane	87	70-130
Tetrachloroethene	76	70-130
2-Hexanone	93	70-130

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Client Sample ID: LCSD

Lab ID#: 2007772A-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**a080404**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/4/20 09:58 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	85	70-130
1,2-Dibromoethane (EDB)	86	70-130
Chlorobenzene	85	70-130
Ethyl Benzene	89	70-130
m,p-Xylene	84	70-130
o-Xylene	86	70-130
Styrene	98	70-130
Bromoform	90	70-130
Cumene	87	70-130
1,1,2,2-Tetrachloroethane	86	70-130
Propylbenzene	89	70-130
4-Ethyltoluene	85	70-130
1,3,5-Trimethylbenzene	91	70-130
1,2,4-Trimethylbenzene	88	70-130
1,3-Dichlorobenzene	84	70-130
1,4-Dichlorobenzene	83	70-130
alpha-Chlorotoluene	106	70-130
1,2-Dichlorobenzene	84	70-130
1,2,4-Trichlorobenzene	88	70-130
Hexachlorobutadiene	88	70-130
Butane	89	70-130
Isopentane	88	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	99	70-130

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8/11/2020
Ms. Elizabeth Kunkel
AECOM
100 N. Broadway, 20th Floor

St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60619901-1.04.003
Workorder #: 2007772B

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 7/29/2020 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 #: 2007772B

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. #**	121921
FAX:		**PROJECT #**	60619901-1.04.003 Roxana Quarterly Soil Vapor
DATE RECEIVED:	07/29/2020	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	08/11/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-072820	Modified ASTM D-1946	8.5 "Hg	15 psi
02A	VMP-15-21.5-072820	Modified ASTM D-1946	7.5 "Hg	15 psi
03A	VMP-15-21.5-072820-DUP	Modified ASTM D-1946	7.0 "Hg	15 psi
04A	VMP-55-20-072820	Modified ASTM D-1946	9.0 "Hg	15 psi
05A	Lab Blank	Modified ASTM D-1946	NA	NA
05B	Lab Blank	Modified ASTM D-1946	NA	NA
06A	LCS	Modified ASTM D-1946	NA	NA
06AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 08/11/20

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209219, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-19-14, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-013, Effective date: 10/18/2019, Expiration date: 10/17/2020.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

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

LABORATORY NARRATIVE
Modified ASTM D-1946
AECOM
Workorder# 2007772B

Four 1 Liter Summa Canister samples were received on July 29, 2020. 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 EATL 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 requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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

Client Sample ID: VMP-15-5-072820

Lab ID#: 2007772B-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	8.2
Nitrogen	0.28	85
Carbon Dioxide	0.028	7.2

Client Sample ID: VMP-15-21.5-072820

Lab ID#: 2007772B-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	1.4
Nitrogen	0.27	78
Methane	0.00027	6.2
Carbon Dioxide	0.027	14
Ethane	0.0027	0.00034 J

Client Sample ID: VMP-15-21.5-072820-DUP

Lab ID#: 2007772B-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	1.4
Nitrogen	0.26	77
Methane	0.00026	6.4
Carbon Dioxide	0.026	15
Ethane	0.0026	0.00056 J

Client Sample ID: VMP-55-20-072820

Lab ID#: 2007772B-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.29	2.7
Nitrogen	0.29	76
Methane	0.00029	0.0016
Carbon Dioxide	0.029	21

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Client Sample ID: VMP-15-5-072820

Lab ID#: 2007772B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10073120**	**Date of Collection: 7/28/20 8:47:00 AM**	
Dil. Factor:	**2.82**	**Date of Analysis: 7/31/20 05:13 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.28	8.2
Nitrogen	0.28	85
Carbon Monoxide	0.028	Not Detected
Methane	0.00028	Not Detected
Carbon Dioxide	0.028	7.2
Ethane	0.0028	Not Detected
Ethene	0.0028	Not Detected
Helium	0.14	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-21.5-072820

Lab ID#: 2007772B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10073121**	**Date of Collection: 7/28/20 9:09:00 AM**	
Dil. Factor:	**2.69**	**Date of Analysis: 7/31/20 05:36 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.27	1.4
Nitrogen	0.27	78
Carbon Monoxide	0.027	Not Detected
Methane	0.00027	6.2
Carbon Dioxide	0.027	14
Ethane	0.0027	0.00034 J
Ethene	0.0027	Not Detected
Helium	0.13	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-21.5-072820-DUP

Lab ID#: 2007772B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10073122**	**Date of Collection: 7/28/20 9:09:00 AM**	
Dil. Factor:	**2.64**	**Date of Analysis: 7/31/20 05:59 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	1.4
Nitrogen	0.26	77
Carbon Monoxide	0.026	Not Detected
Methane	0.00026	6.4
Carbon Dioxide	0.026	15
Ethane	0.0026	0.00056 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-55-20-072820

Lab ID#: 2007772B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10073123**	**Date of Collection: 7/28/20 9:46:00 AM**	
Dil. Factor:	**2.89**	**Date of Analysis: 7/31/20 06:21 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.29	2.7
Nitrogen	0.29	76
Carbon Monoxide	0.029	Not Detected
Methane	0.00029	0.0016
Carbon Dioxide	0.029	21
Ethane	0.0029	Not Detected
Ethene	0.0029	Not Detected
Helium	0.14	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: Lab Blank

Lab ID#: 2007772B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10073105**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/20 09:32 AM**	

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

Container Type: NA - Not Applicable

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Client Sample ID: Lab Blank

Lab ID#: 2007772B-05B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10073104c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/20 09:06 AM**	

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

Container Type: NA - Not Applicable

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Client Sample ID: LCS

Lab ID#: 2007772B-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10073102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/20 08:17 AM**	

Compound	%Recovery	Method Limits
Oxygen	99	85-115
Nitrogen	98	85-115
Carbon Monoxide	95	85-115
Methane	109	85-115
Carbon Dioxide	108	85-115
Ethane	105	85-115
Ethene	106	85-115
Helium	99	85-115

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 2007772B-06AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10073129**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/31/20 10:18 PM**	

Compound	%Recovery	Method Limits
Oxygen	99	85-115
Nitrogen	97	85-115
Carbon Monoxide	94	85-115
Methane	109	85-115
Carbon Dioxide	108	85-115
Ethane	105	85-115
Ethene	106	85-115
Helium	99	85-115

Container Type: NA - Not Applicable

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11/17/2020
Ms. Elizabeth Kunkel
AECOM
100 N. Broadway, 20th Floor

St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60643618-9-04-02F
Workorder #: 2011126A

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 11/4/2020 at Eurofins Air Toxics LLC.

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 LLC. 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 #: 2011126A

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. #**	121921
FAX:		**PROJECT #**	60643618-9-04-02F Roxana Quarterly Soil Vapor
DATE RECEIVED:	11/04/2020	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/17/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-110320	TO-15	6.9 "Hg	15 psi
02A	VMP-15-21.5-110320	TO-15	6.9 "Hg	14.9 psi
03A	VMP-15-25.5-110320	TO-15	6.7 "Hg	15 psi
04A	VMP-55-20-110320	TO-15	6.3 "Hg	14.9 psi
05A	Lab Blank	TO-15	NA	NA
06A	CCV	TO-15	NA	NA
07A	LCS	TO-15	NA	NA
07AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/17/20

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

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

LABORATORY NARRATIVE
EPA Method TO-15
AECOM
Workorder# 2011126A

Four 1 Liter Summa Canister samples were received on November 04, 2020. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

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

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.

Dilution was performed on sample VMP-15-25.5-110320 due to the presence of high level target species.

Dilution was performed on sample VMP-55-20-110320 due to matrix interference.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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

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

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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

Client Sample ID: VMP-15-5-110320

Lab ID#: 2011126A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	0.48 J	6.5	2.4 J
Freon 11	1.3	0.16 J	7.4	0.93 J
Ethanol	5.2	4.7 J	9.9	8.9 J
Acetone	13	25	31	60
2-Propanol	5.2	8.9	13	22
Carbon Disulfide	5.2	0.78 J	16	2.4 J
2-Butanone (Methyl Ethyl Ketone)	5.2	0.54 J	15	1.6 J
2,2,4-Trimethylpentane	1.3	0.55 J	6.1	2.6 J
Tetrachloroethene	1.3	0.23 J	8.9	1.6 J

Client Sample ID: VMP-15-21.5-110320

Lab ID#: 2011126A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	0.24 J	6.5	1.2 J
Ethanol	5.2	8.4	9.9	16
Acetone	13	9.2 J	31	22 J
2-Propanol	5.2	3.2 J	13	7.8 J
2,2,4-Trimethylpentane	1.3	12	6.1	59
Benzene	1.3	0.50 J	4.2	1.6 J
Chlorobenzene	1.3	0.31 J	6.0	1.4 J

Client Sample ID: VMP-15-25.5-110320

Lab ID#: 2011126A-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	21	9.3 J	39	17 J
Acetone	52	28 J	120	66 J
2-Propanol	21	14 J	51	35 J
2,2,4-Trimethylpentane	5.2	1200	24	5700
Benzene	5.2	3.3 J	17	10 J
Butane	21	24	49	56
Isopentane	21	16 J	61	47 J

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

Client Sample ID: VMP-15-25.5-110320

Lab ID#: 2011126A-03A

Client Sample ID: VMP-55-20-110320

Lab ID#: 2011126A-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 11	64	14 J	360	82 J
Ethanol	260	980	480	1800
Acetone	640	570 J	1500	1300 J
2-Propanol	260	1200	630	3100
Carbon Disulfide	260	38 J	800	120 J
Methylene Chloride	640	130 J	2200	450 J
Methyl tert-butyl ether	260	20 J	920	70 J
Hexane	64	32 J	220	110 J
1,1-Dichloroethane	64	9.0 J	260	36 J
Cyclohexane	64	44 J	220	150 J
Carbon Tetrachloride	64	14 J	400	89 J
2,2,4-Trimethylpentane	64	7500	300	35000
Benzene	64	32 J	200	100 J
1,2-Dichloroethane	64	22 J	260	90 J
Trichloroethene	64	360	340	1900
Toluene	64	51 J	240	190 J
Tetrachloroethene	64	15 J	430	100 J
Dibromochloromethane	64	14 J	540	120 J
Ethyl Benzene	64	20 J	280	89 J
m,p-Xylene	64	26 J	280	120 J
o-Xylene	64	14 J	280	63 J
Styrene	64	11 J	270	48 J
Bromoform	64	11 J	660	120 J
Cumene	64	10 J	310	49 J
Propylbenzene	64	13 J	310	63 J
4-Ethyltoluene	64	13 J	310	65 J
1,3,5-Trimethylbenzene	64	9.4 J	310	46 J
1,2,4-Trimethylbenzene	64	13 J	310	65 J
1,3-Dichlorobenzene	64	11 J	380	67 J
1,4-Dichlorobenzene	64	14 J	380	86 J

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

Client Sample ID: VMP-55-20-110320

Lab ID#: 2011126A-04A

alpha-Chlorotoluene	64	14 J	330	72 J
1,2-Dichlorobenzene	64	12 J	380	75 J
1,2,4-Trichlorobenzene	260	16 J	1900	120 J
Hexachlorobutadiene	260	17 J	2700	180 J
Isopentane	260	3300	760	9600

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Client Sample ID: VMP-15-5-110320

Lab ID#: 2011126A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111121**	**Date of Collection:**	**11/3/20 9:14:00 AM**
Dil. Factor:	**2.62**	**Date of Analysis:**	**11/11/20 11:54 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	0.48 J	6.5	2.4 J
Freon 114	1.3	Not Detected	9.2	Not Detected
Chloromethane	13	Not Detected	27	Not Detected
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
1,3-Butadiene	1.3	Not Detected	2.9	Not Detected
Bromomethane	13	Not Detected	51	Not Detected
Chloroethane	5.2	Not Detected	14	Not Detected
Freon 11	1.3	0.16 J	7.4	0.93 J
Ethanol	5.2	4.7 J	9.9	8.9 J
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Acetone	13	25	31	60
2-Propanol	5.2	8.9	13	22
Carbon Disulfide	5.2	0.78 J	16	2.4 J
3-Chloropropene	5.2	Not Detected	16	Not Detected
Methylene Chloride	13	Not Detected	46	Not Detected
Methyl tert-butyl ether	5.2	Not Detected	19	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Hexane	1.3	Not Detected	4.6	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.3	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.2	0.54 J	15	1.6 J
cis-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.9	Not Detected
Chloroform	1.3	Not Detected	6.4	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.1	Not Detected
Cyclohexane	1.3	Not Detected	4.5	Not Detected
Carbon Tetrachloride	1.3	Not Detected	8.2	Not Detected
2,2,4-Trimethylpentane	1.3	0.55 J	6.1	2.6 J
Benzene	1.3	Not Detected	4.2	Not Detected
1,2-Dichloroethane	1.3	Not Detected	5.3	Not Detected
Heptane	1.3	Not Detected	5.4	Not Detected
Trichloroethene	1.3	Not Detected	7.0	Not Detected
1,2-Dichloropropane	1.3	Not Detected	6.0	Not Detected
1,4-Dioxane	5.2	Not Detected	19	Not Detected
Bromodichloromethane	1.3	Not Detected	8.8	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.9	Not Detected
4-Methyl-2-pentanone	1.3	Not Detected	5.4	Not Detected
Toluene	1.3	Not Detected	4.9	Not Detected
trans-1,3-Dichloropropene	1.3	Not Detected	5.9	Not Detected
1,1,2-Trichloroethane	1.3	Not Detected	7.1	Not Detected
Tetrachloroethene	1.3	0.23 J	8.9	1.6 J
2-Hexanone	5.2	Not Detected	21	Not Detected

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Client Sample ID: VMP-15-5-110320

Lab ID#: 2011126A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111121**	**Date of Collection: 11/3/20 9:14:00 AM**	
Dil. Factor:	**2.62**	**Date of Analysis: 11/11/20 11:54 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	10	Not Detected
Chlorobenzene	1.3	Not Detected	6.0	Not Detected
Ethyl Benzene	1.3	Not Detected	5.7	Not Detected
m,p-Xylene	1.3	Not Detected	5.7	Not Detected
o-Xylene	1.3	Not Detected	5.7	Not Detected
Styrene	1.3	Not Detected	5.6	Not Detected
Bromoform	1.3	Not Detected	14	Not Detected
Cumene	1.3	Not Detected	6.4	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	9.0	Not Detected
Propylbenzene	1.3	Not Detected	6.4	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.4	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.4	Not Detected
1,2,4-Trimethylbenzene	1.3	Not Detected	6.4	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.8	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
1,2,4-Trichlorobenzene	5.2	Not Detected	39	Not Detected
Hexachlorobutadiene	5.2	Not Detected	56	Not Detected
Butane	5.2	Not Detected	12	Not Detected
Isopentane	5.2	Not Detected	15	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	115	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: VMP-15-21.5-110320

Lab ID#: 2011126A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111122**	**Date of Collection:**	**11/3/20 9:24:00 AM**
Dil. Factor:	**2.62**	**Date of Analysis:**	**11/12/20 12:23 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.3	0.24 J	6.5	1.2 J
Freon 114	1.3	Not Detected	9.2	Not Detected
Chloromethane	13	Not Detected	27	Not Detected
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
1,3-Butadiene	1.3	Not Detected	2.9	Not Detected
Bromomethane	13	Not Detected	51	Not Detected
Chloroethane	5.2	Not Detected	14	Not Detected
Freon 11	1.3	Not Detected	7.4	Not Detected
Ethanol	5.2	8.4	9.9	16
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Acetone	13	9.2 J	31	22 J
2-Propanol	5.2	3.2 J	13	7.8 J
Carbon Disulfide	5.2	Not Detected	16	Not Detected
3-Chloropropene	5.2	Not Detected	16	Not Detected
Methylene Chloride	13	Not Detected	46	Not Detected
Methyl tert-butyl ether	5.2	Not Detected	19	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Hexane	1.3	Not Detected	4.6	Not Detected
1,1-Dichloroethane	1.3	Not Detected	5.3	Not Detected
2-Butanone (Methyl Ethyl Ketone)	5.2	Not Detected	15	Not Detected
cis-1,2-Dichloroethene	1.3	Not Detected	5.2	Not Detected
Tetrahydrofuran	1.3	Not Detected	3.9	Not Detected
Chloroform	1.3	Not Detected	6.4	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.1	Not Detected
Cyclohexane	1.3	Not Detected	4.5	Not Detected
Carbon Tetrachloride	1.3	Not Detected	8.2	Not Detected
2,2,4-Trimethylpentane	1.3	12	6.1	59
Benzene	1.3	0.50 J	4.2	1.6 J
1,2-Dichloroethane	1.3	Not Detected	5.3	Not Detected
Heptane	1.3	Not Detected	5.4	Not Detected
Trichloroethene	1.3	Not Detected	7.0	Not Detected
1,2-Dichloropropane	1.3	Not Detected	6.0	Not Detected
1,4-Dioxane	5.2	Not Detected	19	Not Detected
Bromodichloromethane	1.3	Not Detected	8.8	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	5.9	Not Detected
4-Methyl-2-pentanone	1.3	Not Detected	5.4	Not Detected
Toluene	1.3	Not Detected	4.9	Not Detected
trans-1,3-Dichloropropene	1.3	Not Detected	5.9	Not Detected
1,1,2-Trichloroethane	1.3	Not Detected	7.1	Not Detected
Tetrachloroethene	1.3	Not Detected	8.9	Not Detected
2-Hexanone	5.2	Not Detected	21	Not Detected

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Client Sample ID: VMP-15-21.5-110320

Lab ID#: 2011126A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111122**	**Date of Collection: 11/3/20 9:24:00 AM**	
Dil. Factor:	**2.62**	**Date of Analysis: 11/12/20 12:23 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	10	Not Detected
Chlorobenzene	1.3	0.31 J	6.0	1.4 J
Ethyl Benzene	1.3	Not Detected	5.7	Not Detected
m,p-Xylene	1.3	Not Detected	5.7	Not Detected
o-Xylene	1.3	Not Detected	5.7	Not Detected
Styrene	1.3	Not Detected	5.6	Not Detected
Bromoform	1.3	Not Detected	14	Not Detected
Cumene	1.3	Not Detected	6.4	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	9.0	Not Detected
Propylbenzene	1.3	Not Detected	6.4	Not Detected
4-Ethyltoluene	1.3	Not Detected	6.4	Not Detected
1,3,5-Trimethylbenzene	1.3	Not Detected	6.4	Not Detected
1,2,4-Trimethylbenzene	1.3	Not Detected	6.4	Not Detected
1,3-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	6.8	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	7.9	Not Detected
1,2,4-Trichlorobenzene	5.2	Not Detected	39	Not Detected
Hexachlorobutadiene	5.2	Not Detected	56	Not Detected
Butane	5.2	Not Detected	12	Not Detected
Isopentane	5.2	Not Detected	15	Not Detected

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	122	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: VMP-15-25.5-110320

Lab ID#: 2011126A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111131**	**Date of Collection:**	**11/3/20 9:36:00 AM**
Dil. Factor:	**10.4**	**Date of Analysis:**	**11/12/20 08:15 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	5.2	Not Detected	26	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	12	Not Detected
Bromomethane	52	Not Detected	200	Not Detected
Chloroethane	21	Not Detected	55	Not Detected
Freon 11	5.2	Not Detected	29	Not Detected
Ethanol	21	9.3 J	39	17 J
Freon 113	5.2	Not Detected	40	Not Detected
1,1-Dichloroethene	5.2	Not Detected	21	Not Detected
Acetone	52	28 J	120	66 J
2-Propanol	21	14 J	51	35 J
Carbon Disulfide	21	Not Detected	65	Not Detected
3-Chloropropene	21	Not Detected	65	Not Detected
Methylene Chloride	52	Not Detected	180	Not Detected
Methyl tert-butyl ether	21	Not Detected	75	Not Detected
trans-1,2-Dichloroethene	5.2	Not Detected	21	Not Detected
Hexane	5.2	Not Detected	18	Not Detected
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	21	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	33	Not Detected
2,2,4-Trimethylpentane	5.2	1200	24	5700
Benzene	5.2	3.3 J	17	10 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	75	Not Detected
Bromodichloromethane	5.2	Not Detected	35	Not Detected
cis-1,3-Dichloropropene	5.2	Not Detected	24	Not Detected
4-Methyl-2-pentanone	5.2	Not Detected	21	Not Detected
Toluene	5.2	Not Detected	20	Not Detected
trans-1,3-Dichloropropene	5.2	Not Detected	24	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	85	Not Detected

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Client Sample ID: VMP-15-25.5-110320

Lab ID#: 2011126A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111131**	**Date of Collection: 11/3/20 9:36:00 AM**	
Dil. Factor:	**10.4**	**Date of Analysis: 11/12/20 08:15 AM**	

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	54	Not Detected
Cumene	5.2	Not Detected	26	Not Detected
1,1,2,2-Tetrachloroethane	5.2	Not Detected	36	Not Detected
Propylbenzene	5.2	Not Detected	26	Not Detected
4-Ethyltoluene	5.2	Not Detected	26	Not Detected
1,3,5-Trimethylbenzene	5.2	Not Detected	26	Not Detected
1,2,4-Trimethylbenzene	5.2	Not Detected	26	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	24	49	56
Isopentane	21	16 J	61	47 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	126	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VMP-55-20-110320

Lab ID#: 2011126A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111124**	**Date of Collection:**	**11/3/20 10:06:00 AM**
Dil. Factor:	**128**	**Date of Analysis:**	**11/12/20 01:20 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	64	Not Detected	320	Not Detected
Freon 114	64	Not Detected	450	Not Detected
Chloromethane	640	Not Detected	1300	Not Detected
Vinyl Chloride	64	Not Detected	160	Not Detected
1,3-Butadiene	64	Not Detected	140	Not Detected
Bromomethane	640	Not Detected	2500	Not Detected
Chloroethane	260	Not Detected	680	Not Detected
Freon 11	64	14 J	360	82 J
Ethanol	260	980	480	1800
Freon 113	64	Not Detected	490	Not Detected
1,1-Dichloroethene	64	Not Detected	250	Not Detected
Acetone	640	570 J	1500	1300 J
2-Propanol	260	1200	630	3100
Carbon Disulfide	260	38 J	800	120 J
3-Chloropropene	260	Not Detected	800	Not Detected
Methylene Chloride	640	130 J	2200	450 J
Methyl tert-butyl ether	260	20 J	920	70 J
trans-1,2-Dichloroethene	64	Not Detected	250	Not Detected
Hexane	64	32 J	220	110 J
1,1-Dichloroethane	64	9.0 J	260	36 J
2-Butanone (Methyl Ethyl Ketone)	260	Not Detected	750	Not Detected
cis-1,2-Dichloroethene	64	Not Detected	250	Not Detected
Tetrahydrofuran	64	Not Detected	190	Not Detected
Chloroform	64	Not Detected	310	Not Detected
1,1,1-Trichloroethane	64	Not Detected	350	Not Detected
Cyclohexane	64	44 J	220	150 J
Carbon Tetrachloride	64	14 J	400	89 J
2,2,4-Trimethylpentane	64	7500	300	35000
Benzene	64	32 J	200	100 J
1,2-Dichloroethane	64	22 J	260	90 J
Heptane	64	Not Detected	260	Not Detected
Trichloroethene	64	360	340	1900
1,2-Dichloropropane	64	Not Detected	300	Not Detected
1,4-Dioxane	260	Not Detected	920	Not Detected
Bromodichloromethane	64	Not Detected	430	Not Detected
cis-1,3-Dichloropropene	64	Not Detected	290	Not Detected
4-Methyl-2-pentanone	64	Not Detected	260	Not Detected
Toluene	64	51 J	240	190 J
trans-1,3-Dichloropropene	64	Not Detected	290	Not Detected
1,1,2-Trichloroethane	64	Not Detected	350	Not Detected
Tetrachloroethene	64	15 J	430	100 J
2-Hexanone	260	Not Detected	1000	Not Detected

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Client Sample ID: VMP-55-20-110320

Lab ID#: 2011126A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111124**	**Date of Collection: 11/3/20 10:06:00 AM**	
Dil. Factor:	**128**	**Date of Analysis: 11/12/20 01:20 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	64	14 J	540	120 J
1,2-Dibromoethane (EDB)	64	Not Detected	490	Not Detected
Chlorobenzene	64	Not Detected	290	Not Detected
Ethyl Benzene	64	20 J	280	89 J
m,p-Xylene	64	26 J	280	120 J
o-Xylene	64	14 J	280	63 J
Styrene	64	11 J	270	48 J
Bromoform	64	11 J	660	120 J
Cumene	64	10 J	310	49 J
1,1,2,2-Tetrachloroethane	64	Not Detected	440	Not Detected
Propylbenzene	64	13 J	310	63 J
4-Ethyltoluene	64	13 J	310	65 J
1,3,5-Trimethylbenzene	64	9.4 J	310	46 J
1,2,4-Trimethylbenzene	64	13 J	310	65 J
1,3-Dichlorobenzene	64	11 J	380	67 J
1,4-Dichlorobenzene	64	14 J	380	86 J
alpha-Chlorotoluene	64	14 J	330	72 J
1,2-Dichlorobenzene	64	12 J	380	75 J
1,2,4-Trichlorobenzene	260	16 J	1900	120 J
Hexachlorobutadiene	260	17 J	2700	180 J
Butane	260	Not Detected	610	Not Detected
Isopentane	260	3300	760	9600

J = Estimated value.

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	121	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2011126A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111106a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 12:39 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	0.23 J	3.8	0.43 J
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	0.12 J	4.9	0.29 J
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	2.0	Not Detected	7.2	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 2011126A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111106a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 12:39 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	0.038 J	3.0	0.23 J
1,4-Dichlorobenzene	0.50	0.034 J	3.0	0.20 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	0.074 J	15	0.55 J
Hexachlorobutadiene	2.0	0.13 J	21	1.4 J
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	96	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: CCV

Lab ID#: 2011126A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111103**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 10:22 AM**

Compound	%Recovery
Freon 12	123
Freon 114	106
Chloromethane	90
Vinyl Chloride	107
1,3-Butadiene	126
Bromomethane	97
Chloroethane	92
Freon 11	116
Ethanol	122
Freon 113	96
1,1-Dichloroethene	98
Acetone	102
2-Propanol	124
Carbon Disulfide	93
3-Chloropropene	98
Methylene Chloride	122
Methyl tert-butyl ether	102
trans-1,2-Dichloroethene	104
Hexane	110
1,1-Dichloroethane	107
2-Butanone (Methyl Ethyl Ketone)	99
cis-1,2-Dichloroethene	100
Tetrahydrofuran	121
Chloroform	113
1,1,1-Trichloroethane	112
Cyclohexane	96
Carbon Tetrachloride	117
2,2,4-Trimethylpentane	108
Benzene	96
1,2-Dichloroethane	127
Heptane	97
Trichloroethene	103
1,2-Dichloropropane	98
1,4-Dioxane	95
Bromodichloromethane	112
cis-1,3-Dichloropropene	101
4-Methyl-2-pentanone	103
Toluene	97
trans-1,3-Dichloropropene	114
1,1,2-Trichloroethane	96
Tetrachloroethene	104
2-Hexanone	106

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Client Sample ID: CCV

Lab ID#: 2011126A-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 10:22 AM**	

Compound	%Recovery
Dibromochloromethane	112
1,2-Dibromoethane (EDB)	103
Chlorobenzene	101
Ethyl Benzene	103
m,p-Xylene	104
o-Xylene	105
Styrene	104
Bromoform	109
Cumene	108
1,1,2,2-Tetrachloroethane	93
Propylbenzene	103
4-Ethyltoluene	104
1,3,5-Trimethylbenzene	106
1,2,4-Trimethylbenzene	111
1,3-Dichlorobenzene	105
1,4-Dichlorobenzene	107
alpha-Chlorotoluene	112
1,2-Dichlorobenzene	103
1,2,4-Trichlorobenzene	100
Hexachlorobutadiene	103
Butane	100
Isopentane	112

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	123	70-130
4-Bromofluorobenzene	107	70-130

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Client Sample ID: LCS

Lab ID#: 2011126A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 10:52 AM**	

Compound	%Recovery	Method Limits
Freon 12	122	70-130
Freon 114	108	70-130
Chloromethane	72	70-130
Vinyl Chloride	111	70-130
1,3-Butadiene	129	70-130
Bromomethane	97	70-130
Chloroethane	96	70-130
Freon 11	118	70-130
Ethanol	111	70-130
Freon 113	102	70-130
1,1-Dichloroethene	110	70-130
Acetone	104	70-130
2-Propanol	125	70-130
Carbon Disulfide	98	70-130
3-Chloropropene	102	70-130
Methylene Chloride	119	70-130
Methyl tert-butyl ether	106	70-130
trans-1,2-Dichloroethene	112	70-130
Hexane	115	70-130
1,1-Dichloroethane	110	70-130
2-Butanone (Methyl Ethyl Ketone)	102	70-130
cis-1,2-Dichloroethene	105	70-130
Tetrahydrofuran	122	70-130
Chloroform	116	70-130
1,1,1-Trichloroethane	112	70-130
Cyclohexane	96	70-130
Carbon Tetrachloride	118	70-130
2,2,4-Trimethylpentane	106	70-130
Benzene	95	70-130
1,2-Dichloroethane	122	70-130
Heptane	96	70-130
Trichloroethene	103	70-130
1,2-Dichloropropane	97	70-130
1,4-Dioxane	94	70-130
Bromodichloromethane	110	70-130
cis-1,3-Dichloropropene	99	70-130
4-Methyl-2-pentanone	101	70-130
Toluene	94	70-130
trans-1,3-Dichloropropene	111	70-130
1,1,2-Trichloroethane	93	70-130
Tetrachloroethene	102	70-130
2-Hexanone	104	70-130

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Client Sample ID: LCS

Lab ID#: 2011126A-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 10:52 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	107	70-130
1,2-Dibromoethane (EDB)	101	70-130
Chlorobenzene	100	70-130
Ethyl Benzene	102	70-130
m,p-Xylene	103	70-130
o-Xylene	102	70-130
Styrene	104	70-130
Bromoform	105	70-130
Cumene	104	70-130
1,1,2,2-Tetrachloroethane	89	70-130
Propylbenzene	100	70-130
4-Ethyltoluene	99	70-130
1,3,5-Trimethylbenzene	102	70-130
1,2,4-Trimethylbenzene	109	70-130
1,3-Dichlorobenzene	100	70-130
1,4-Dichlorobenzene	103	70-130
alpha-Chlorotoluene	106	70-130
1,2-Dichlorobenzene	98	70-130
1,2,4-Trichlorobenzene	106	70-130
Hexachlorobutadiene	113	70-130
Butane	106	70-130
Isopentane	110	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	122	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCSD

Lab ID#: 2011126A-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111105**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 11:21 AM**	

Compound	%Recovery	Method Limits
Freon 12	124	70-130
Freon 114	113	70-130
Chloromethane	62 Q	70-130
Vinyl Chloride	115	70-130
1,3-Butadiene	132 Q	70-130
Bromomethane	98	70-130
Chloroethane	98	70-130
Freon 11	120	70-130
Ethanol	112	70-130
Freon 113	104	70-130
1,1-Dichloroethene	109	70-130
Acetone	105	70-130
2-Propanol	128	70-130
Carbon Disulfide	101	70-130
3-Chloropropene	104	70-130
Methylene Chloride	121	70-130
Methyl tert-butyl ether	109	70-130
trans-1,2-Dichloroethene	111	70-130
Hexane	118	70-130
1,1-Dichloroethane	112	70-130
2-Butanone (Methyl Ethyl Ketone)	108	70-130
cis-1,2-Dichloroethene	110	70-130
Tetrahydrofuran	124	70-130
Chloroform	119	70-130
1,1,1-Trichloroethane	115	70-130
Cyclohexane	102	70-130
Carbon Tetrachloride	120	70-130
2,2,4-Trimethylpentane	110	70-130
Benzene	98	70-130
1,2-Dichloroethane	118	70-130
Heptane	98	70-130
Trichloroethene	104	70-130
1,2-Dichloropropane	95	70-130
1,4-Dioxane	95	70-130
Bromodichloromethane	109	70-130
cis-1,3-Dichloropropene	100	70-130
4-Methyl-2-pentanone	100	70-130
Toluene	94	70-130
trans-1,3-Dichloropropene	112	70-130
1,1,2-Trichloroethane	94	70-130
Tetrachloroethene	103	70-130
2-Hexanone	103	70-130

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Client Sample ID: LCSD

Lab ID#: 2011126A-07AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p111105**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 11:21 AM**	

Compound	%Recovery	Method Limits
Dibromochloromethane	107	70-130
1,2-Dibromoethane (EDB)	102	70-130
Chlorobenzene	100	70-130
Ethyl Benzene	100	70-130
m,p-Xylene	103	70-130
o-Xylene	103	70-130
Styrene	105	70-130
Bromoform	105	70-130
Cumene	102	70-130
1,1,2,2-Tetrachloroethane	89	70-130
Propylbenzene	100	70-130
4-Ethyltoluene	99	70-130
1,3,5-Trimethylbenzene	101	70-130
1,2,4-Trimethylbenzene	109	70-130
1,3-Dichlorobenzene	100	70-130
1,4-Dichlorobenzene	102	70-130
alpha-Chlorotoluene	105	70-130
1,2-Dichlorobenzene	98	70-130
1,2,4-Trichlorobenzene	112	70-130
Hexachlorobutadiene	117	70-130
Butane	102	70-130
Isopentane	112	70-130

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	124	70-130
4-Bromofluorobenzene	105	70-130

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11/17/2020
Ms. Elizabeth Kunkel
AECOM
100 N. Broadway, 20th Floor

St. Louis MO 63102

Project Name: Roxana Quarterly Soil Vapor
Project #: 60643618-9-04-02F
Workorder #: 2011126B

Dear Ms. Elizabeth Kunkel

The following report includes the data for the above referenced project for sample(s) received on 11/4/2020 at Eurofins Air Toxics LLC.

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 LLC. 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 #: 2011126B

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. #**	121921
FAX:		**PROJECT #**	60643618-9-04-02F Roxana Quarterly Soil Vapor
DATE RECEIVED:	11/04/2020	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/17/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VMP-15-5-110320	Modified ASTM D-1946	6.9 "Hg	15 psi
02A	VMP-15-21.5-110320	Modified ASTM D-1946	6.9 "Hg	14.9 psi
03A	VMP-15-25.5-110320	Modified ASTM D-1946	6.7 "Hg	15 psi
04A	VMP-55-20-110320	Modified ASTM D-1946	6.3 "Hg	14.9 psi
05A	Lab Blank	Modified ASTM D-1946	NA	NA
05B	Lab Blank	Modified ASTM D-1946	NA	NA
06A	LCS	Modified ASTM D-1946	NA	NA
06AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/17/20

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

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

LABORATORY NARRATIVE
Modified ASTM D-1946
AECOM
Workorder# 2011126B

Four 1 Liter Summa Canister samples were received on November 04, 2020. 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 EATL 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 requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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

Client Sample ID: VMP-15-5-110320

Lab ID#: 2011126B-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	15
Nitrogen	0.26	81
Carbon Dioxide	0.026	3.9

Client Sample ID: VMP-15-21.5-110320

Lab ID#: 2011126B-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	2.4
Nitrogen	0.26	82
Methane	0.00026	0.071
Carbon Dioxide	0.026	15
Helium	0.13	0.0084 J

Client Sample ID: VMP-15-25.5-110320

Lab ID#: 2011126B-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	2.5
Nitrogen	0.26	78
Methane	0.00026	0.11
Carbon Dioxide	0.026	19

Client Sample ID: VMP-55-20-110320

Lab ID#: 2011126B-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	1.5
Nitrogen	0.26	73
Methane	0.00026	3.5
Carbon Dioxide	0.026	22
Ethane	0.0026	0.00073 J

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

Client Sample ID: VMP-55-20-110320

Lab ID#: 2011126B-04A

Helium	0.13	0.032 J

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Client Sample ID: VMP-15-5-110320

Lab ID#: 2011126B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111133**	**Date of Collection: 11/3/20 9:14:00 AM**	
Dil. Factor:	**2.63**	**Date of Analysis: 11/11/20 04:12 PM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Oxygen	0.26	15
Nitrogen	0.26	81
Carbon Monoxide	0.026	Not Detected
Methane	0.00026	Not Detected
Carbon Dioxide	0.026	3.9
Ethane	0.0026	Not Detected
Ethene	0.0026	Not Detected
Helium	0.13	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-21.5-110320

Lab ID#: 2011126B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111132**	**Date of Collection: 11/3/20 9:24:00 AM**	
Dil. Factor:	**2.62**	**Date of Analysis: 11/11/20 03:50 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	2.4
Nitrogen	0.26	82
Carbon Monoxide	0.026	Not Detected
Methane	0.00026	0.071
Carbon Dioxide	0.026	15
Ethane	0.0026	Not Detected
Ethene	0.0026	Not Detected
Helium	0.13	0.0084 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-15-25.5-110320

Lab ID#: 2011126B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111134**	**Date of Collection: 11/3/20 9:36:00 AM**	
Dil. Factor:	**2.60**	**Date of Analysis: 11/11/20 04:33 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	2.5
Nitrogen	0.26	78
Carbon Monoxide	0.026	Not Detected
Methane	0.00026	0.11
Carbon Dioxide	0.026	19
Ethane	0.0026	Not Detected
Ethene	0.0026	Not Detected
Helium	0.13	Not Detected

Container Type: 1 Liter Summa Canister

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Client Sample ID: VMP-55-20-110320

Lab ID#: 2011126B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111135**	**Date of Collection: 11/3/20 10:06:00 AM**	
Dil. Factor:	**2.55**	**Date of Analysis: 11/11/20 04:55 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.26	1.5
Nitrogen	0.26	73
Carbon Monoxide	0.026	Not Detected
Methane	0.00026	3.5
Carbon Dioxide	0.026	22
Ethane	0.0026	0.00073 J
Ethene	0.0026	Not Detected
Helium	0.13	0.032 J

J = Estimated value.

Container Type: 1 Liter Summa Canister

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Client Sample ID: Lab Blank

Lab ID#: 2011126B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111130**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 03:05 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#: 2011126B-05B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111129c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 02:41 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#: 2011126B-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111128**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 02:16 PM**	

Compound	%Recovery	Method Limits
Oxygen	98	85-115
Nitrogen	98	85-115
Carbon Monoxide	92	85-115
Methane	102	85-115
Carbon Dioxide	110	85-115
Ethane	99	85-115
Ethene	100	85-115
Helium	100	85-115

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 2011126B-06AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10111152**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 11/11/20 11:06 PM**	

Compound	%Recovery	Method Limits
Oxygen	99	85-115
Nitrogen	98	85-115
Carbon Monoxide	92	85-115
Methane	105	85-115
Carbon Dioxide	110	85-115
Ethane	102	85-115
Ethene	102	85-115
Helium	99	85-115

Container Type: NA - Not Applicable