



FINAL IAQ SAMPLING REPORT

CENTENNIAL HALL RENOVATION 2022
CBJ Contract BE22-204

as required by Section 018113
and for LEED IAQc4

Prepared for

Carver Construction, LLC
1012 Second Street
Douglas, AK 99824

25 March 2024

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INTRODUCTION

The subject project is a renovation of the ballrooms at Centennial Hall in Juneau, AK undertaken as CBJ project BE22-204. Construction activities performed for this project include demolition and/or removal of concrete, wood, gypsum board, acoustical wall and ceiling panels, doors, operable walls, along with associated trims and finishes, followed by replacement with new materials and finishes. Work was generally restricted to Ballrooms 1-3 which received structural and acoustical upgrades at both floor and catwalk levels. In addition, upgrades to the HVAC system were provided for the ballrooms.

This Final Indoor Air Quality (IAQ) Sampling Report summarizes the activities performed to protect the health and safety of workers and building occupants during and after construction and to decrease emissions of indoor air contaminants. Additionally, it provides the results from indoor air quality assessments of standard indoor air contaminants of concern. The sampling is also intended to provide an IAQ Indoor Air Quality Assessment in accordance with LEED IEQ v4.

Note that the overall LEED credits for NC IEQ v4 can be achieved either by following a full building flush-out procedure (Option 1, Path 2) or by performing air testing that verifies that the building air quality meets the LEED standards (Option 2, Path 1 and/or Path 2). On this project, both flushing and air testing were performed. The building was partially occupied during construction, so assessments were selected to be suitable for occupied buildings.

CONTAMINANTS OF CONCERN

All construction projects that include demolition of existing materials and installation of new materials have the potential to release contaminants into the building and to cause exposure to current or future occupants. Contaminants of concern on this project include dust and debris, welding fumes, and fumes or vapors from volatile products used in installation and cleaning as well as in paints and other finishes.

Construction activities with a potential to generate contaminants include:

- Grinding of concrete;
- Demolition and patching of walls, both operable and fixed;
- Welding for structural upgrades;
- Removal and replacement of interior finishes;
- Removal and replacement of exterior finishes;
- Removal and installation of acoustical wall and ceiling panels;
- Installation of spray-on fireproofing; and
- Miscellaneous other tasks required to complete the contract work.

Activities that are particularly prone to creating dust or fumes include grinding concrete and welding. Installation of new finishes is the most likely source of volatile organic compounds. All activities were planned to be performed in a manner that minimized the release of contaminants and exhausted air from the work areas outside the building.



HVAC SYSTEM PROTECTION DURING CONSTRUCTION

A common concern during construction projects is contamination of the building HVAC system by particulates or fumes generated as part of the work activities. To prevent this from occurring, the building HVAC system in the work areas was not used during construction. All supply and return grilles in the work area were sealed with 6-mil polyethylene sheeting which remained in place for the duration of the project. Note that the HVAC system was still in use in other areas of the building that were occupied throughout the construction period.

Heat was provided to the work areas using space heaters. Active work areas were ventilated using negative air machines to filter contaminants from the air (MERV17-20 level filtration), provide adequate air exchange for worker occupancy, and creating a slight negative pressure in the work area to assure that no dust or fumes could migrate from the active work area into the occupied areas of the building.

BALLROOM AIR FLUSHING

After installation of the new HVAC components was completed and all new finishes had been applied in the work areas, the building flush-out activities were performed and filtration media for the HVAC system were replaced with new media in accordance with the requirements of the mechanical system components.

The Centennial Hall ballrooms have a total volume of 12,300 square feet and the new HVAC system has a capacity of 17,400 cubic feet per minute. The duration of time required to meet the contract requirement of 14,000 cubic feet per square foot of space is:

$$\frac{14,000 \text{ cf/sf} \times 12,300 \text{ sf}}{17,400 \text{ sf}} = 9,869 \text{ minutes} = 6.8 \text{ days}$$

Flushing was carried out starting on 21 August 2023 with the system on full supply air and full exhaust with no recirculation. A few interruptions took place to adjust equipment, with the cumulative flushing volume was completed by 31 August. Fortunately, weather conditions were favorable during the flushing event, allowing temperature and humidity requirements (temperature at or above 60F and relative humidity no higher than 60%) to be met. This flushing event satisfies the requirements set forth for the new HVAC system components as well as for the LEED NC IAQ v4 qualification.

IAQ MEASUREMENTS

Measurements were taken on 31 January 2024 with one sample collected in each ballroom. The new partition walls were put in position to divide the ballrooms into three separate sampling spaces. Samples were collected from the center of each ballroom.

Volatile organic chemicals were measured using the EPA TO-15 method, collecting air samples from each ballroom into a 6-liter vacuum canister (Summa canister) with regulated inflow over a period of 8 hours. Canisters were returned to EMSL Laboratory's LA Testing location for analysis via gas chromatography/mass spectrometry (GC/MS).



Sample results are included in Appendix A. Table 1 includes values for all target compounds with a measurable detection (often referred to as a “hits-only” table).

Compounds that were detected include freon 12, butane, isopropyl alcohol, ethanol, acetone, cyclohexane, toluene (not detected in the Ballroom 2 sample), and styrene. All of these are common contaminants found in new materials, adhesives, and cleaning compounds. The sampling goal is for none of these compounds to exceed NIOSH Recommended Exposure Limit and for the total of all the measurable hits to be less than 500 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

Target Compound	Results in $\mu\text{g}/\text{m}^3$			
	Ballroom 1	Ballroom 2	Ballroom 3	NIOSH REL
Freon 12	4.3	3.4	4.1	4,900,000
n-Butane	11	7.8	10	1,900,000
Ethanol	40	30	37	1,900,000
Isopropyl alcohol	4.6	6.3	3.8	980,000
Acetone	20	12	18	590,000
Cyclohexane	5.1	4.7	5	1,000,000
Toluene	2.4	ND	2.2	380,000
Styrene	3.3	2.9	3.7	210,000
TOTALS	90.7	67.1	83.8	NA

REQUIREMENT: total of all measured compounds no more than $500 \mu\text{g}/\text{m}^3$
and no compound above the NIOSH REL (recommended exposure limit)

NOTE: All other target compounds were not detected in the samples (ND).

Totals for each sample were well below the allowable levels and many orders of magnitude below the NIOSH recommended exposure limit.

Particulates were measured with a Quest Technologies EVM-series meter, with each sample run for 15 minutes. Particulates were measured in the PM-10 and the PM-2.5 size ranges. Particulate levels were far below the LEED requirement of $50 \mu\text{g}/\text{m}^3$ and several orders of magnitude below the EPA recommended exposure limit. Measurements are presented in Table 2.

Particulate Size	Results in $\mu\text{g}/\text{m}^3$			
	Ballroom 1	Ballroom 2	Ballroom 3	EPA REL
PM-10	0.003	0.004	0.002	150
PM-2.5	0.001	0.001	0.001	65

REQUIREMENT: PM-10 less than 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)
and less than the EPA REL (recommended exposure limit)



Carbon monoxide was also measured in all three ballrooms using the Quest Technologies meter. Carbon monoxide was not detected in any of the ballrooms at a concentration of 1 part per million or higher. The LEED requirement for carbon monoxide measurements matches the EPA recommended exposure limit, which is less than 9 parts per million and no more than 2 parts per million higher than outdoor levels. Measurements are presented in Table 3.

TABLE 3. Centennial Hall Particulate Measurements				
Particulate Size	Results in ppm			
	Ballroom 1	Ballroom 2	Ballroom 3	EPA REL
Carbon monoxide	<1	<1	<1	9

REQUIREMENT: less than 9 ppm and no more than 2 ppm over outdoor levels.

NOTE: Outdoor level of carbon monoxide was <1 ppm.

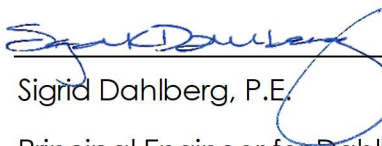
CONCLUSION

Flushing activities meet project requirements for both mechanical system purposes and for LEED IAQc4 purposes.

Based on the results of IAQ measurements, indoor air quality levels in the Centennial Hall ballrooms meet the final clearance standards set forth in LEED IEQc4 and no further sampling is necessary.

THIRD-PARTY SAMPLER CONFIRMATION

I certify that all measurements and assessments on this project were performed by Dahlberg Design, LLC, a third-party firm, and subcontract laboratories, without any intervention from the Contractor or any other party with a vested interest in the outcome of this sampling.



 Sigrid Dahlberg, P.E.
 Principal Engineer for Dahlberg Design, LLC



APPENDIX A

ANALYTICAL LABORATOR RESULTS





LA TESTING
 5431 Industrial Drive
 Huntington Beach, CA 92649
 Telephone: (714)828-4999 FAX: (714)828-4944
hblab@lateesting.com | <http://www.EMSL.com>

EMSL ORDER ID: 332402243
 EMSL CUSTOMER ID: DAHL75

Attention: Sigrid Dahlberg
 Dahlberg Design
 222 Seward Street
 Suite 205
 Juneau, AK 99801-1239

Customer PO:
EMSL Project ID:
Project Name: CENTENNIAL HALL 2023

Phone: 907-723-8896
Email: sigrid@dahlberg.design

Collected: 01/31/2024 08:34
Received: 02/09/2024 10:25
Analyzed: See Results
Reported: 2/15/2024

Laboratory Report- Sample Summary

EMSL Sample ID.	Client Sample ID.	Start Sampling Date	Start Sampling Time
332402243-0001	BALLROOM 1	1/31/2024	8:34 AM
332402243-0002	BALLROOM 3	1/31/2024	8:39 AM
332402243-0003	BALLROOM 2	1/31/2024	8:38 AM

If "Preliminary Report" is displayed in the signature box; this indicates that there are samples that have not yet been analyzed, that are in a preliminary state, or that analysis is in progress but not completed at the time of report issue.

Report Date	Report Revision	Revision Comments
2/15/2024	R0	Initial Report

Michael Chapman, Laboratory Manager
 or other approved signatory

Test results meet all AIHA-LAP,LLC requirements unless otherwise specified. Laboratory ID 101650

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.



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Case Narrative

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

Column

Restek RTX-502.2, 60m, 0.25mm ID, 1.4um

Concentrator Traps:

Entech Dual Cold Traps: (1) 1/8" No Packing, (2) 1/8" Tenax.

Gas Standards:

Certified Gas standards were used for all analyses.

Sample Volumes:

Sample volume aliquots for this procedure are 250cc for indoor/ ambient air and 25cc for soil gas. Other volumes for sample dilutions are reflected on each result page.

Holding Times:

Standard holding times of 30 days were met for all samples.

Sampling Pressures:

All samples were received at acceptable pressure/vacuum unless listed below.

Sample Dilutions:

Dilutions reported are designated by the sample # with a "DL" suffix resulting from initial analysis having compounds exceeding calibration as reported with an "E" qualifier. Ethanol and Isopropanol are not diluted for and may be reported with an "E" qualifier on the final result.

QA/QC criteria outside method specifications are listed below (if applicable).

Initial Calibration

All Initial Calibration criteria met method specification.

Initial Calibration Verification Standard (ICVS)- Second Source

ICVS met method specification with 70-130% recovery for 100% of compounds.

Laboratory Control Sample (LCS)

LCS met method specification with 70-130% recovery for 100% of compounds. (If the LCS does not meet criteria but any compounds which have recoveries >130% are not found in the samples, samples may be reported)



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Case Narrative

Continuing Calibration Verification Standard (CCVS)

CCVS met method specification with all compounds within 30% deviation.

Ending Calibration Verification Standard (ECVS)

ECVS met method specification with all compounds within 30% deviation.

Method Blanks (MB)

Method Blank met method specification.

Reporting Limit Laboratory Control Samples (RLLCS)

RLLCS met method specification with 90% of compounds within the 60-140% recovery range. Individual compounds outside of the recovery range may be listed below.

Manual Integration: -Listed below if applicable. Before and after documentation provided in extended deliverable packages.

The following data qualifiers that may have been reported with the data.

ND- Non Detect. This notation would be used in the results column in lieu of a "U" qualifier.

U- Compound was analyzed for but not detected at a listed and appropriately adjusted reporting level.

J (Target)- Concentration estimated between Reporting Limit and MDL.

J- Estimated value reported below adjusted reporting limit for target compounds or estimating a concentration for TICs where a 1:1 response is assumed

B- Compound found in associated method blank as well as in the sample.

E- Estimated value exceeding upper calibration range of instrument. Ethanol and isopropyl alcohol are not specifically targeted to dilute within calibration range.

D- Compound reported from additional diluted analysis.

N- indicates presumptive evidence of a compound based on library search match.

EMSL Analytical, Inc. certifies that this data package is in compliance with the terms and conditions of this contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer –readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature.

Michael Chapman, Laboratory Manager
or other approved signatory



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 CUSTOMER SAMPLE ID: BALLROOM 1

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Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	02/13/2024	HP	T2158.D	E15530	250 cc	1

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Propylene	115-07-1	42.08	ND	1.0		ND	1.7	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	0.86	0.50		4.3	2.5	
Freon 114(1,2-Dichlorotetrafluoroethan	76-14-2	170.9	ND	0.50		ND	3.5	
Chloromethane	74-87-3	50.49	ND	0.50		ND	1.0	
n-Butane	106-97-8	58.12	4.8	0.50		11	1.2	
Vinyl chloride	75-01-4	62.50	ND	0.50		ND	1.3	
1,3-Butadiene	106-99-0	54.09	ND	0.50		ND	1.1	
Bromomethane	74-83-9	94.94	ND	0.50		ND	1.9	
Chloroethane	75-00-3	64.51	ND	0.50		ND	1.3	
Ethanol	64-17-5	46.07	21	0.50		40	0.94	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	0.50		ND	2.2	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	0.50		ND	2.8	
Isopropyl alcohol(2-Propanol)	67-63-0	60.09	1.9	0.50		4.6	1.2	
Freon 113(1,1,2-Trichlorotrifluoroethan	76-13-1	187.4	ND	0.50		ND	3.8	
Acetone	67-64-1	58.08	8.4	0.50		20	1.2	
1,1-Dichloroethene	75-35-4	96.94	ND	0.50		ND	2.0	
Acetonitrile	75-05-8	41.05	ND	0.50		ND	0.84	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	ND	0.50		ND	1.5	
Bromoethane(Ethyl bromide)	74-96-4	109.0	ND	0.50		ND	2.2	
3-Chloropropene(Allyl chloride)	107-05-1	76.52	ND	0.50		ND	1.6	
Carbon disulfide	75-15-0	76.14	ND	0.50		ND	1.6	
Methylene chloride	75-09-2	84.93	ND	0.50		ND	1.7	
Acrylonitrile	107-13-1	53.08	ND	0.50		ND	1.1	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND	0.50		ND	1.8	
trans-1,2-Dichloroethene	156-60-5	96.94	ND	0.50		ND	2.0	
n-Hexane	110-54-3	86.18	ND	0.50		ND	1.8	
1,1-Dichloroethane	75-34-3	98.96	ND	0.50		ND	2.0	
Vinyl acetate	108-05-4	86.09	ND	0.50		ND	1.8	
2-Butanone(MEK)	78-93-3	72.11	ND	0.50		ND	1.5	
cis-1,2-Dichloroethene	156-59-2	96.94	ND	0.50		ND	2.0	
Ethyl acetate	141-78-6	88.11	ND	0.50		ND	1.8	
Chloroform	67-66-3	119.4	ND	0.50		ND	2.4	
Tetrahydrofuran	109-99-9	72.11	ND	0.50		ND	1.5	
1,1,1-Trichloroethane	71-55-6	133.4	ND	0.50		ND	2.7	
Cyclohexane	110-82-7	84.16	1.5	0.50		5.1	1.7	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	0.50		ND	2.3	
Carbon tetrachloride	56-23-5	153.8	ND	0.50		ND	3.1	
n-Heptane	142-82-5	100.2	ND	0.50		ND	2.0	
1,2-Dichloroethane	107-06-2	98.96	ND	0.50		ND	2.0	
Benzene	71-43-2	78.11	ND	0.50		ND	1.6	
Trichloroethene	79-01-6	131.4	ND	0.50		ND	2.7	
1,2-Dichloropropane	78-87-5	113.0	ND	0.50		ND	2.3	
Methyl Methacrylate	80-62-6	100.1	ND	0.50		ND	2.0	
Bromodichloromethane	75-27-4	163.8	ND	0.50		ND	3.3	
1,4-Dioxane	123-91-1	88.11	ND	0.50		ND	1.8	



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Reported: 2/15/2024

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	02/13/2024	HP	T2158.D	E15530	250 cc	1

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	ND	0.50		ND	2.0	
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	0.50		ND	2.3	
Toluene	108-88-3	92.14	0.63	0.50		2.4	1.9	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	0.50		ND	2.3	
1,1,2-Trichloroethane	79-00-5	133.4	ND	0.50		ND	2.7	
2-Hexanone(MBK)	591-78-6	100.2	ND	0.50		ND	2.0	
Tetrachloroethene	127-18-4	165.8	ND	0.50		ND	3.4	
Dibromochloromethane	124-48-1	208.3	ND	0.50		ND	4.3	
1,2-Dibromoethane	106-93-4	187.9	ND	0.50		ND	3.8	
Chlorobenzene	108-90-7	112.6	ND	0.50		ND	2.3	
Ethylbenzene	100-41-4	106.2	ND	0.50		ND	2.2	
Xylene (p,m)	1330-20-7	106.2	ND	1.0		ND	4.3	
Xylene (Ortho)	95-47-6	106.2	ND	0.50		ND	2.2	
Styrene	100-42-5	104.1	0.78	0.50		3.3	2.1	
Isopropylbenzene (cumene)	98-82-8	120.2	ND	0.50		ND	2.5	
Bromoform	75-25-2	252.7	ND	0.50		ND	5.2	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	0.50		ND	3.4	
4-Ethyltoluene	622-96-8	120.2	ND	0.50		ND	2.5	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	0.50		ND	2.5	
2-Chlorotoluene	95-49-8	126.6	ND	0.50		ND	2.6	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	0.50		ND	2.5	
1,3-Dichlorobenzene	541-73-1	147.0	ND	0.50		ND	3.0	
1,4-Dichlorobenzene	106-46-7	147.0	ND	0.50		ND	3.0	
Benzyl chloride	100-44-7	126.6	ND	0.50		ND	2.6	
1,2-Dichlorobenzene	95-50-1	147.0	ND	0.50		ND	3.0	
1,2,4-Trichlorobenzene	120-82-1	181.4	ND	0.50		ND	3.7	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	0.50		ND	5.3	
Naphthalene	91-20-3	128.2	ND	0.50		ND	2.6	
Total Target Compound Concentrations:			40	ppbv		91	ug/m3	

Surrogate
 4-Bromofluorobenzene

Result 9.3 **Spike** 10 **Recovery** 93%

Qualifier Definitions

ND = Non Detect
 B = Compound also found in method blank.
 E= Estimated concentration exceeding upper calibration range.
 D= Result reported from diluted analysis.
 J= Concentration estimated between Reporting Limit and MDL.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).



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	02/13/2024	HP	T2158.D	E15530	250 cc	1

NIOSH and OSHA Exposure Limit Comparisons

Target Compounds	Tox. Basis	CAS#	MW	Result ppbv	Q	Result ug/m3	NIOSH REL		OSHA PEL	
							ug/m3	>	ug/m3	>
Propylene	NC	115-07-1	42.08	ND		ND	N.E.		N.E.	
Freon 12(Dichlorodifluoromethane)	NC	75-71-8	120.9	0.86		4.3	4900000		4900000	
Freon 114(1,2-Dichlorotetrafluoroethan	--	76-14-2	170.9	ND		ND	7000000		7000000	
Chloromethane	NC	74-87-3	50.49	ND		ND	LFC		210000	
n-Butane	--	106-97-8	58.12	4.8		11	1900000		N.E.	
Vinyl chloride	C	75-01-4	62.50	ND		ND	LFC		2600	
1,3-Butadiene	C	106-99-0	54.09	ND		ND	LFC		2200	
Bromomethane	NC	74-83-9	94.94	ND		ND	LFC		78000	
Chloroethane	NC	75-00-3	64.51	ND		ND	LFC		2600000	
Ethanol	--	64-17-5	46.07	21		40	1900000		1900000	
Bromoethene(Vinyl bromide)	C	593-60-2	106.9	ND		ND	LFC		N.E.	
Freon 11(Trichlorofluoromethane)	--	75-69-4	137.4	ND		ND	5600000		5600000	
Isopropyl alcohol(2-Propanol)	NC	67-63-0	60.09	1.9		4.6	980000		980000	
Freon 113(1,1,2-Trichlorotrifluoroethan	NC	76-13-1	187.4	ND		ND	7700000		7700000	
Acetone	NC	67-64-1	58.08	8.4		20	590000		2400000	
1,1-Dichloroethene	NC	75-35-4	96.94	ND		ND	790000		N.E.	
Acetonitrile	NC	75-05-8	41.05	ND		ND	34000		67000	
Tertiary butyl alcohol(TBA)	--	75-65-0	74.12	ND		ND	300000		300000	
Bromoethane(Ethyl bromide)	--	74-96-4	109.0	ND		ND	880000		880000	
3-Chloropropene(Allyl chloride)	C	107-05-1	76.52	ND		ND	3100		3100	
Carbon disulfide	NC	75-15-0	76.14	ND		ND	3100		62000	
Methylene chloride	C	75-09-2	84.93	ND		ND	LFC		87000	
Acrylonitrile	C	107-13-1	53.08	ND		ND	2200		4300	
Methyl-tert-butyl ether(MTBE)	C	1634-04-4	88.15	ND		ND	N.E.		N.E.	
trans-1,2-Dichloroethene	--	156-60-5	96.94	ND		ND	790000		790000	
n-Hexane	NC	110-54-3	86.18	ND		ND	180000		1800000	
1,1-Dichloroethane	C	75-34-3	98.96	ND		ND	400000		400000	
Vinyl acetate	NC	108-05-4	86.09	ND		ND	14000		N.E.	
2-Butanone(MEK)	NC	78-93-3	72.11	ND		ND	590000		590000	
cis-1,2-Dichloroethene	--	156-59-2	96.94	ND		ND	790000		790000	
Ethyl acetate	NC	141-78-6	88.11	ND		ND	1400000		1400000	
Chloroform	C	67-66-3	119.4	ND		ND	9800		240000	
Tetrahydrofuran	NC	109-99-9	72.11	ND		ND	590000		590000	
1,1,1-Trichloroethane	NC	71-55-6	133.4	ND		ND	1900000		1900000	
Cyclohexane	NC	110-82-7	84.16	1.5		5.1	1000000		1000000	
2,2,4-Trimethylpentane(Isooctane)	--	540-84-1	114.2	ND		ND	N.E.		N.E.	
Carbon tetrachloride	C	56-23-5	153.8	ND		ND	13000		63000	
n-Heptane	NC	142-82-5	100.2	ND		ND	350000		2000000	
1,2-Dichloroethane	C	107-06-2	98.96	ND		ND	4000		200000	
Benzene	C	71-43-2	78.11	ND		ND	320		3200	
Trichloroethene	C	79-01-6	131.4	ND		ND	130000		540000	
1,2-Dichloropropane	C	78-87-5	113.0	ND		ND	LFC		350000	
Methyl Methacrylate	NC	80-62-6	100.1	ND		ND	410000		410000	
Bromodichloromethane	C	75-27-4	163.8	ND		ND	N.E.		N.E.	
1,4-Dioxane	C	123-91-1	88.11	ND		ND	3600		360000	
4-Methyl-2-pentanone(MIBK)	NC	108-10-1	100.2	ND		ND	200000		410000	
cis-1,3-Dichloropropene**	C	10061-01-5	111.0	ND		ND	4500		N.E.	



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 5431 Industrial Drive
 Huntington Beach, CA 92649
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 hblab@latesting.com | http://www.EMSL.com

EMSL ORDER ID: 332402243
 EMSL CUSTOMER ID: DAHL75
 EMSL SAMPLE ID: 332402243-0001
 CUSTOMER SAMPLE ID: BALLROOM 1

Attention: Sigrid Dahlberg
 Dahlberg Design
 222 Seward Street
 Suite 205
 Juneau, AK 99801-1239

Customer PO:
EMSL Project ID:
Project Name: CENTENNIAL HALL 2023

Phone: 907-723-8896
Email: sigrid@dahlberg.design

Collected: 01/31/2024 08:34
Received: 02/09/2024 10:25
Analyzed: See Results
Reported: 2/15/2024

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	02/13/2024	HP	T2158.D	E15530	250 cc	1

NIOSH and OSHA Exposure Limit Comparisons

Target Compounds	Tox. Basis	CAS#	MW	Result ppbv	Q	Result ug/m3	NIOSH REL		OSHA PEL	
							ug/m3	>	ug/m3	>
Toluene	NC	108-88-3	92.14	0.63		2.4	380000		750000	
trans-1,3-Dichloropropene**	C	10061-02-6	111.0	ND		ND	4500		N.E.	
1,1,2-Trichloroethane	C	79-00-5	133.4	ND		ND	55000		55000	
2-Hexanone(MBK)	NC	591-78-6	100.2	ND		ND	4100		410000	
Tetrachloroethene	C	127-18-4	165.8	ND		ND	LFC		680000	
Dibromochloromethane	--	124-48-1	208.3	ND		ND	N.E.		N.E.	
1,2-Dibromoethane	C	106-93-4	187.9	ND		ND	350		150000	
Chlorobenzene	NC	108-90-7	112.6	ND		ND	N.E.		350000	
Ethylbenzene	C	100-41-4	106.2	ND		ND	430000		430000	
Xylene (p,m)	NC	1330-20-7	106.2	ND		ND	430000		430000	
Xylene (Ortho)	NC	95-47-6	106.2	ND		ND	430000		430000	
Styrene	NC	100-42-5	104.1	0.78		3.3	210000		430000	
Isopropylbenzene (cumene)	NC	98-82-8	120.2	ND		ND	250000		250000	
Bromoform	C	75-25-2	252.7	ND		ND	5200		5200	
1,1,1,2-Tetrachloroethane	C	79-34-5	167.9	ND		ND	6900		34000	
4-Ethyltoluene	--	622-96-8	120.2	ND		ND	N.E.		N.E.	
1,3,5-Trimethylbenzene	NC	108-67-8	120.2	ND		ND	120000		N.E.	
2-Chlorotoluene	--	95-49-8	126.6	ND		ND	260000		N.E.	
1,2,4-Trimethylbenzene	NC	95-63-6	120.2	ND		ND	120000		N.E.	
1,3-Dichlorobenzene	--	541-73-1	147.0	ND		ND	N.E.		N.E.	
1,4-Dichlorobenzene	C	106-46-7	147.0	ND		ND	LFC		450000	
Benzyl chloride	C	100-44-7	126.6	ND		ND	5200		5200	
1,2-Dichlorobenzene	NC	95-50-1	147.0	ND		ND	300000		300000	
1,2,4-Trichlorobenzene	NC	120-82-1	181.4	ND		ND	37000		N.E.	
Hexachloro-1,3-butadiene	C	87-68-3	260.8	ND		ND	210		N.E.	
Naphthalene	C	91-20-3	128.2	ND		ND	52000		52000	

**The concentrations of each isomer should be added if multiple isomers are present and compared to the total screening level.

The > column is used to flag exceedances as marked

Exposure Limit Definitions

REL= Recommended Exposure Limit, PEL= Permissible Exposure Limit

Compound Exposure Definitions

NE= No Limit Established NS= No Screening Value
 LFC= Lowest Feasible Concentration

Agency Definitions

NIOSH= The National Institute for Occupational Safety and Health

OSHA= Occupational Safety and Health Administration

Reference

Occupational Safety and Health Administration (OSHA) (2017) Air Contaminants. 29 CFR 1910.1000 [82 FR 2735, January 9, 2017].

Qualifier Definitions

B = Compound also found in method blank. ND = Non Detect
 E= Estimated concentration exceeding upper calibration range.
 D= Result reported from diluted analysis.
 J= Concentration estimated between Reporting Limit and MDL.

Carcinogenic (C) Exceedance

Value exceeds the theoretical risk that 1 additional case of cancer will occur in a population of 1 million than statistically expected.
 Thus is a theoretical risk and not an actual epidemiological one.

NonCarcinogenic (NC) Exceedance

Value exceeds the theoretical risk that 1 in a population of 100,000 will experience deleterious health effects.
 Thus is a theoretical risk and not an actual epidemiological one.



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 5431 Industrial Drive
 Huntington Beach, CA 92649
 Telephone: (714)828-4999 FAX: (714)828-4944
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EMSL ORDER ID: 332402243
 EMSL CUSTOMER ID: DAHL75
 EMSL SAMPLE ID: 332402243-0002
 CUSTOMER SAMPLE ID: BALLROOM 3

Attention: Sigrid Dahlberg
 Dahlberg Design
 222 Seward Street
 Suite 205
 Juneau, AK 99801-1239

Customer PO:
EMSL Project ID:
Project Name: CENTENNIAL HALL 2023

Phone: 907-723-8896
Email: sigrid@dahlberg.design

Collected: 01/31/2024 08:39
Received: 02/09/2024 10:25
Analyzed: See Results
Reported: 2/15/2024

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	02/13/2024	HP	T2159.D	E0666	250 cc	1

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Propylene	115-07-1	42.08	ND	1.0		ND	1.7	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	0.82	0.50		4.1	2.5	
Freon 114(1,2-Dichlorotetrafluoroethan	76-14-2	170.9	ND	0.50		ND	3.5	
Chloromethane	74-87-3	50.49	ND	0.50		ND	1.0	
n-Butane	106-97-8	58.12	4.1	0.50		10	1.2	
Vinyl chloride	75-01-4	62.50	ND	0.50		ND	1.3	
1,3-Butadiene	106-99-0	54.09	ND	0.50		ND	1.1	
Bromomethane	74-83-9	94.94	ND	0.50		ND	1.9	
Chloroethane	75-00-3	64.51	ND	0.50		ND	1.3	
Ethanol	64-17-5	46.07	20	0.50		37	0.94	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	0.50		ND	2.2	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	0.50		ND	2.8	
Isopropyl alcohol(2-Propanol)	67-63-0	60.09	1.5	0.50		3.8	1.2	
Freon 113(1,1,2-Trichlorotrifluoroethan	76-13-1	187.4	ND	0.50		ND	3.8	
Acetone	67-64-1	58.08	7.6	0.50		18	1.2	
1,1-Dichloroethene	75-35-4	96.94	ND	0.50		ND	2.0	
Acetonitrile	75-05-8	41.05	ND	0.50		ND	0.84	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	ND	0.50		ND	1.5	
Bromoethane(Ethyl bromide)	74-96-4	109.0	ND	0.50		ND	2.2	
3-Chloropropene(Allyl chloride)	107-05-1	76.52	ND	0.50		ND	1.6	
Carbon disulfide	75-15-0	76.14	ND	0.50		ND	1.6	
Methylene chloride	75-09-2	84.93	ND	0.50		ND	1.7	
Acrylonitrile	107-13-1	53.08	ND	0.50		ND	1.1	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND	0.50		ND	1.8	
trans-1,2-Dichloroethene	156-60-5	96.94	ND	0.50		ND	2.0	
n-Hexane	110-54-3	86.18	ND	0.50		ND	1.8	
1,1-Dichloroethane	75-34-3	98.96	ND	0.50		ND	2.0	
Vinyl acetate	108-05-4	86.09	ND	0.50		ND	1.8	
2-Butanone(MEK)	78-93-3	72.11	ND	0.50		ND	1.5	
cis-1,2-Dichloroethene	156-59-2	96.94	ND	0.50		ND	2.0	
Ethyl acetate	141-78-6	88.11	ND	0.50		ND	1.8	
Chloroform	67-66-3	119.4	ND	0.50		ND	2.4	
Tetrahydrofuran	109-99-9	72.11	ND	0.50		ND	1.5	
1,1,1-Trichloroethane	71-55-6	133.4	ND	0.50		ND	2.7	
Cyclohexane	110-82-7	84.16	1.5	0.50		5.0	1.7	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	0.50		ND	2.3	
Carbon tetrachloride	56-23-5	153.8	ND	0.50		ND	3.1	
n-Heptane	142-82-5	100.2	ND	0.50		ND	2.0	
1,2-Dichloroethane	107-06-2	98.96	ND	0.50		ND	2.0	
Benzene	71-43-2	78.11	ND	0.50		ND	1.6	
Trichloroethene	79-01-6	131.4	ND	0.50		ND	2.7	
1,2-Dichloropropane	78-87-5	113.0	ND	0.50		ND	2.3	
Methyl Methacrylate	80-62-6	100.1	ND	0.50		ND	2.0	
Bromodichloromethane	75-27-4	163.8	ND	0.50		ND	3.3	
1,4-Dioxane	123-91-1	88.11	ND	0.50		ND	1.8	



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EMSL ORDER ID: 332402243
 EMSL CUSTOMER ID: DAHL75
 EMSL SAMPLE ID: 332402243-0002
 CUSTOMER SAMPLE ID: BALLROOM 3

Attention: Sigrid Dahlberg
 Dahlberg Design
 222 Seward Street
 Suite 205
 Juneau, AK 99801-1239

Customer PO:
EMSL Project ID:
Project Name: CENTENNIAL HALL 2023

Phone: 907-723-8896
Email: sigrid@dahlberg.design

Collected: 01/31/2024 08:39
Received: 02/09/2024 10:25
Analyzed: See Results
Reported: 2/15/2024

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	02/13/2024	HP	T2159.D	E0666	250 cc	1

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	ND	0.50		ND	2.0	
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	0.50		ND	2.3	
Toluene	108-88-3	92.14	0.58	0.50		2.2	1.9	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	0.50		ND	2.3	
1,1,2-Trichloroethane	79-00-5	133.4	ND	0.50		ND	2.7	
2-Hexanone(MBK)	591-78-6	100.2	ND	0.50		ND	2.0	
Tetrachloroethene	127-18-4	165.8	ND	0.50		ND	3.4	
Dibromochloromethane	124-48-1	208.3	ND	0.50		ND	4.3	
1,2-Dibromoethane	106-93-4	187.9	ND	0.50		ND	3.8	
Chlorobenzene	108-90-7	112.6	ND	0.50		ND	2.3	
Ethylbenzene	100-41-4	106.2	ND	0.50		ND	2.2	
Xylene (p,m)	1330-20-7	106.2	ND	1.0		ND	4.3	
Xylene (Ortho)	95-47-6	106.2	ND	0.50		ND	2.2	
Styrene	100-42-5	104.1	0.87	0.50		3.7	2.1	
Isopropylbenzene (cumene)	98-82-8	120.2	ND	0.50		ND	2.5	
Bromoform	75-25-2	252.7	ND	0.50		ND	5.2	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	0.50		ND	3.4	
4-Ethyltoluene	622-96-8	120.2	ND	0.50		ND	2.5	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	0.50		ND	2.5	
2-Chlorotoluene	95-49-8	126.6	ND	0.50		ND	2.6	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	0.50		ND	2.5	
1,3-Dichlorobenzene	541-73-1	147.0	ND	0.50		ND	3.0	
1,4-Dichlorobenzene	106-46-7	147.0	ND	0.50		ND	3.0	
Benzyl chloride	100-44-7	126.6	ND	0.50		ND	2.6	
1,2-Dichlorobenzene	95-50-1	147.0	ND	0.50		ND	3.0	
1,2,4-Trichlorobenzene	120-82-1	181.4	ND	0.50		ND	3.7	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	0.50		ND	5.3	
Naphthalene	91-20-3	128.2	ND	0.50		ND	2.6	
Total Target Compound Concentrations:			37	ppbv		84	ug/m3	

Surrogate
 4-Bromofluorobenzene

Result 9.3 **Spike** 10 **Recovery** 93%

Qualifier Definitions

ND = Non Detect
 B = Compound also found in method blank.
 E= Estimated concentration exceeding upper calibration range.
 D= Result reported from diluted analysis.
 J= Concentration estimated between Reporting Limit and MDL.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).



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 5431 Industrial Drive
 Huntington Beach, CA 92649
 Telephone: (714)828-4999 FAX: (714)828-4944
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 EMSL CUSTOMER ID: DAHL75
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Customer PO:
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Collected: 01/31/2024 08:39
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Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	02/13/2024	HP	T2159.D	E0666	250 cc	1

NIOSH and OSHA Exposure Limit Comparisons

Target Compounds	Tox. Basis	CAS#	MW	Result ppbv	Q	Result ug/m3	NIOSH REL		OSHA PEL	
							ug/m3	>	ug/m3	>
Propylene	NC	115-07-1	42.08	ND		ND	N.E.		N.E.	
Freon 12(Dichlorodifluoromethane)	NC	75-71-8	120.9	0.82		4.1	4900000		4900000	
Freon 114(1,2-Dichlorotetrafluoroethan	--	76-14-2	170.9	ND		ND	7000000		7000000	
Chloromethane	NC	74-87-3	50.49	ND		ND	LFC		210000	
n-Butane	--	106-97-8	58.12	4.1		10	1900000		N.E.	
Vinyl chloride	C	75-01-4	62.50	ND		ND	LFC		2600	
1,3-Butadiene	C	106-99-0	54.09	ND		ND	LFC		2200	
Bromomethane	NC	74-83-9	94.94	ND		ND	LFC		78000	
Chloroethane	NC	75-00-3	64.51	ND		ND	LFC		2600000	
Ethanol	--	64-17-5	46.07	20		37	1900000		1900000	
Bromoethene(Vinyl bromide)	C	593-60-2	106.9	ND		ND	LFC		N.E.	
Freon 11(Trichlorofluoromethane)	--	75-69-4	137.4	ND		ND	5600000		5600000	
Isopropyl alcohol(2-Propanol)	NC	67-63-0	60.09	1.5		3.8	980000		980000	
Freon 113(1,1,2-Trichlorotrifluoroethan	NC	76-13-1	187.4	ND		ND	7700000		7700000	
Acetone	NC	67-64-1	58.08	7.6		18	590000		2400000	
1,1-Dichloroethene	NC	75-35-4	96.94	ND		ND	790000		N.E.	
Acetonitrile	NC	75-05-8	41.05	ND		ND	34000		67000	
Tertiary butyl alcohol(TBA)	--	75-65-0	74.12	ND		ND	300000		300000	
Bromoethane(Ethyl bromide)	--	74-96-4	109.0	ND		ND	880000		880000	
3-Chloropropene(Allyl chloride)	C	107-05-1	76.52	ND		ND	3100		3100	
Carbon disulfide	NC	75-15-0	76.14	ND		ND	3100		62000	
Methylene chloride	C	75-09-2	84.93	ND		ND	LFC		87000	
Acrylonitrile	C	107-13-1	53.08	ND		ND	2200		4300	
Methyl-tert-butyl ether(MTBE)	C	1634-04-4	88.15	ND		ND	N.E.		N.E.	
trans-1,2-Dichloroethene	--	156-60-5	96.94	ND		ND	790000		790000	
n-Hexane	NC	110-54-3	86.18	ND		ND	180000		1800000	
1,1-Dichloroethane	C	75-34-3	98.96	ND		ND	400000		400000	
Vinyl acetate	NC	108-05-4	86.09	ND		ND	14000		N.E.	
2-Butanone(MEK)	NC	78-93-3	72.11	ND		ND	590000		590000	
cis-1,2-Dichloroethene	--	156-59-2	96.94	ND		ND	790000		790000	
Ethyl acetate	NC	141-78-6	88.11	ND		ND	1400000		1400000	
Chloroform	C	67-66-3	119.4	ND		ND	9800		240000	
Tetrahydrofuran	NC	109-99-9	72.11	ND		ND	590000		590000	
1,1,1-Trichloroethane	NC	71-55-6	133.4	ND		ND	1900000		1900000	
Cyclohexane	NC	110-82-7	84.16	1.5		5.0	1000000		1000000	
2,2,4-Trimethylpentane(Isooctane)	--	540-84-1	114.2	ND		ND	N.E.		N.E.	
Carbon tetrachloride	C	56-23-5	153.8	ND		ND	13000		63000	
n-Heptane	NC	142-82-5	100.2	ND		ND	350000		2000000	
1,2-Dichloroethane	C	107-06-2	98.96	ND		ND	4000		200000	
Benzene	C	71-43-2	78.11	ND		ND	320		3200	
Trichloroethene	C	79-01-6	131.4	ND		ND	130000		540000	
1,2-Dichloropropane	C	78-87-5	113.0	ND		ND	LFC		350000	
Methyl Methacrylate	NC	80-62-6	100.1	ND		ND	410000		410000	
Bromodichloromethane	C	75-27-4	163.8	ND		ND	N.E.		N.E.	
1,4-Dioxane	C	123-91-1	88.11	ND		ND	3600		360000	
4-Methyl-2-pentanone(MIBK)	NC	108-10-1	100.2	ND		ND	200000		410000	
cis-1,3-Dichloropropene**	C	10061-01-5	111.0	ND		ND	4500		N.E.	



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 5431 Industrial Drive
 Huntington Beach, CA 92649
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EMSL ORDER ID: 332402243
 EMSL CUSTOMER ID: DAHL75
 EMSL SAMPLE ID: 332402243-0002
 CUSTOMER SAMPLE ID: BALLROOM 3

Attention: Sigrid Dahlberg
 Dahlberg Design
 222 Seward Street
 Suite 205
 Juneau, AK 99801-1239

Customer PO:
EMSL Project ID:
Project Name: CENTENNIAL HALL 2023

Phone: 907-723-8896
Email: sigrid@dahlberg.design

Collected: 01/31/2024 08:39
Received: 02/09/2024 10:25
Analyzed: See Results
Reported: 2/15/2024

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	02/13/2024	HP	T2159.D	E0666	250 cc	1

NIOSH and OSHA Exposure Limit Comparisons

Target Compounds	Tox. Basis	CAS#	MW	Result ppbv	Q	Result ug/m3	NIOSH REL		OSHA PEL	
							ug/m3	>	ug/m3	>
Toluene	NC	108-88-3	92.14	0.58		2.2	380000		750000	
trans-1,3-Dichloropropene**	C	10061-02-6	111.0	ND		ND	4500		N.E.	
1,1,2-Trichloroethane	C	79-00-5	133.4	ND		ND	55000		55000	
2-Hexanone(MBK)	NC	591-78-6	100.2	ND		ND	4100		410000	
Tetrachloroethene	C	127-18-4	165.8	ND		ND	LFC		680000	
Dibromochloromethane	--	124-48-1	208.3	ND		ND	N.E.		N.E.	
1,2-Dibromoethane	C	106-93-4	187.9	ND		ND	350		150000	
Chlorobenzene	NC	108-90-7	112.6	ND		ND	N.E.		350000	
Ethylbenzene	C	100-41-4	106.2	ND		ND	430000		430000	
Xylene (p,m)	NC	1330-20-7	106.2	ND		ND	430000		430000	
Xylene (Ortho)	NC	95-47-6	106.2	ND		ND	430000		430000	
Styrene	NC	100-42-5	104.1	0.87		3.7	210000		430000	
Isopropylbenzene (cumene)	NC	98-82-8	120.2	ND		ND	250000		250000	
Bromoform	C	75-25-2	252.7	ND		ND	5200		5200	
1,1,2,2-Tetrachloroethane	C	79-34-5	167.9	ND		ND	6900		34000	
4-Ethyltoluene	--	622-96-8	120.2	ND		ND	N.E.		N.E.	
1,3,5-Trimethylbenzene	NC	108-67-8	120.2	ND		ND	120000		N.E.	
2-Chlorotoluene	--	95-49-8	126.6	ND		ND	260000		N.E.	
1,2,4-Trimethylbenzene	NC	95-63-6	120.2	ND		ND	120000		N.E.	
1,3-Dichlorobenzene	--	541-73-1	147.0	ND		ND	N.E.		N.E.	
1,4-Dichlorobenzene	C	106-46-7	147.0	ND		ND	LFC		450000	
Benzyl chloride	C	100-44-7	126.6	ND		ND	5200		5200	
1,2-Dichlorobenzene	NC	95-50-1	147.0	ND		ND	300000		300000	
1,2,4-Trichlorobenzene	NC	120-82-1	181.4	ND		ND	37000		N.E.	
Hexachloro-1,3-butadiene	C	87-68-3	260.8	ND		ND	210		N.E.	
Naphthalene	C	91-20-3	128.2	ND		ND	52000		52000	

**The concentrations of each isomer should be added if multiple isomers are present and compared to the total screening level.

The > column is used to flag exceedances as marked

Exposure Limit Definitions

REL= Recommended Exposure Limit, PEL= Permissible Exposure Limit

Compound Exposure Definitions

NE= No Limit Established NS= No Screening Value
 LFC= Lowest Feasible Concentration

Agency Definitions

NIOSH= The National Institute for Occupational Safety and Health

OSHA= Occupational Safety and Health Administration

Reference

Occupational Safety and Health Administration (OSHA) (2017) Air Contaminants. 29 CFR 1910.1000 [82 FR 2735, January 9, 2017].

Qualifier Definitions

B = Compound also found in method blank. ND = Non Detect
 E= Estimated concentration exceeding upper calibration range.
 D= Result reported from diluted analysis.
 J= Concentration estimated between Reporting Limit and MDL.

Carcinogenic (C) Exceedance

Value exceeds the theoretical risk that 1 additional case of cancer will occur in a population of 1 million than statistically expected.
 Thus is a theoretical risk and not an actual epidemiological one.

NonCarcinogenic (NC) Exceedance

Value exceeds the theoretical risk that 1 in a population of 100,000 will experience deleterious health effects.
 Thus is a theoretical risk and not an actual epidemiological one.



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 Huntington Beach, CA 92649
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EMSL ORDER ID: 332402243
 EMSL CUSTOMER ID: DAHL75
 EMSL SAMPLE ID: 332402243-0003
 CUSTOMER SAMPLE ID: BALLROOM 2

Attention: Sigrid Dahlberg
 Dahlberg Design
 222 Seward Street
 Suite 205
 Juneau, AK 99801-1239

Customer PO:
EMSL Project ID:
Project Name: CENTENNIAL HALL 2023

Phone: 907-723-8896
Email: sigrid@dahlberg.design

Collected: 01/31/2024 08:38
Received: 02/09/2024 10:25
Analyzed: See Results
Reported: 2/15/2024

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	02/13/2024	HP	T2160.D	E15526	250 cc	1

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Propylene	115-07-1	42.08	ND	1.0		ND	1.7	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	0.69	0.50		3.4	2.5	
Freon 114(1,2-Dichlorotetrafluoroethan	76-14-2	170.9	ND	0.50		ND	3.5	
Chloromethane	74-87-3	50.49	ND	0.50		ND	1.0	
n-Butane	106-97-8	58.12	3.3	0.50		7.8	1.2	
Vinyl chloride	75-01-4	62.50	ND	0.50		ND	1.3	
1,3-Butadiene	106-99-0	54.09	ND	0.50		ND	1.1	
Bromomethane	74-83-9	94.94	ND	0.50		ND	1.9	
Chloroethane	75-00-3	64.51	ND	0.50		ND	1.3	
Ethanol	64-17-5	46.07	16	0.50		30	0.94	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	0.50		ND	2.2	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	0.50		ND	2.8	
Isopropyl alcohol(2-Propanol)	67-63-0	60.09	2.6	0.50		6.3	1.2	
Freon 113(1,1,2-Trichlorotrifluoroethan	76-13-1	187.4	ND	0.50		ND	3.8	
Acetone	67-64-1	58.08	5.0	0.50		12	1.2	
1,1-Dichloroethene	75-35-4	96.94	ND	0.50		ND	2.0	
Acetonitrile	75-05-8	41.05	ND	0.50		ND	0.84	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	ND	0.50		ND	1.5	
Bromoethane(Ethyl bromide)	74-96-4	109.0	ND	0.50		ND	2.2	
3-Chloropropene(Allyl chloride)	107-05-1	76.52	ND	0.50		ND	1.6	
Carbon disulfide	75-15-0	76.14	ND	0.50		ND	1.6	
Methylene chloride	75-09-2	84.93	ND	0.50		ND	1.7	
Acrylonitrile	107-13-1	53.08	ND	0.50		ND	1.1	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND	0.50		ND	1.8	
trans-1,2-Dichloroethene	156-60-5	96.94	ND	0.50		ND	2.0	
n-Hexane	110-54-3	86.18	ND	0.50		ND	1.8	
1,1-Dichloroethane	75-34-3	98.96	ND	0.50		ND	2.0	
Vinyl acetate	108-05-4	86.09	ND	0.50		ND	1.8	
2-Butanone(MEK)	78-93-3	72.11	ND	0.50		ND	1.5	
cis-1,2-Dichloroethene	156-59-2	96.94	ND	0.50		ND	2.0	
Ethyl acetate	141-78-6	88.11	ND	0.50		ND	1.8	
Chloroform	67-66-3	119.4	ND	0.50		ND	2.4	
Tetrahydrofuran	109-99-9	72.11	ND	0.50		ND	1.5	
1,1,1-Trichloroethane	71-55-6	133.4	ND	0.50		ND	2.7	
Cyclohexane	110-82-7	84.16	1.4	0.50		4.7	1.7	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	0.50		ND	2.3	
Carbon tetrachloride	56-23-5	153.8	ND	0.50		ND	3.1	
n-Heptane	142-82-5	100.2	ND	0.50		ND	2.0	
1,2-Dichloroethane	107-06-2	98.96	ND	0.50		ND	2.0	
Benzene	71-43-2	78.11	ND	0.50		ND	1.6	
Trichloroethene	79-01-6	131.4	ND	0.50		ND	2.7	
1,2-Dichloropropane	78-87-5	113.0	ND	0.50		ND	2.3	
Methyl Methacrylate	80-62-6	100.1	ND	0.50		ND	2.0	
Bromodichloromethane	75-27-4	163.8	ND	0.50		ND	3.3	
1,4-Dioxane	123-91-1	88.11	ND	0.50		ND	1.8	



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EMSL ORDER ID: 332402243
 EMSL CUSTOMER ID: DAHL75
 EMSL SAMPLE ID: 332402243-0003
 CUSTOMER SAMPLE ID: BALLROOM 2

Attention: Sigrid Dahlberg
 Dahlberg Design
 222 Seward Street
 Suite 205
 Juneau, AK 99801-1239

Customer PO:
EMSL Project ID:
Project Name: CENTENNIAL HALL 2023

Phone: 907-723-8896
Email: sigrid@dahlberg.design

Collected: 01/31/2024 08:38
Received: 02/09/2024 10:25
Analyzed: See Results
Reported: 2/15/2024

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	02/13/2024	HP	T2160.D	E15526	250 cc	1

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	ND	0.50		ND	2.0	
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	0.50		ND	2.3	
Toluene	108-88-3	92.14	ND	0.50		ND	1.9	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	0.50		ND	2.3	
1,1,2-Trichloroethane	79-00-5	133.4	ND	0.50		ND	2.7	
2-Hexanone(MBK)	591-78-6	100.2	ND	0.50		ND	2.0	
Tetrachloroethene	127-18-4	165.8	ND	0.50		ND	3.4	
Dibromochloromethane	124-48-1	208.3	ND	0.50		ND	4.3	
1,2-Dibromoethane	106-93-4	187.9	ND	0.50		ND	3.8	
Chlorobenzene	108-90-7	112.6	ND	0.50		ND	2.3	
Ethylbenzene	100-41-4	106.2	ND	0.50		ND	2.2	
Xylene (p,m)	1330-20-7	106.2	ND	1.0		ND	4.3	
Xylene (Ortho)	95-47-6	106.2	ND	0.50		ND	2.2	
Styrene	100-42-5	104.1	0.68	0.50		2.9	2.1	
Isopropylbenzene (cumene)	98-82-8	120.2	ND	0.50		ND	2.5	
Bromoform	75-25-2	252.7	ND	0.50		ND	5.2	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	0.50		ND	3.4	
4-Ethyltoluene	622-96-8	120.2	ND	0.50		ND	2.5	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	0.50		ND	2.5	
2-Chlorotoluene	95-49-8	126.6	ND	0.50		ND	2.6	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	0.50		ND	2.5	
1,3-Dichlorobenzene	541-73-1	147.0	ND	0.50		ND	3.0	
1,4-Dichlorobenzene	106-46-7	147.0	ND	0.50		ND	3.0	
Benzyl chloride	100-44-7	126.6	ND	0.50		ND	2.6	
1,2-Dichlorobenzene	95-50-1	147.0	ND	0.50		ND	3.0	
1,2,4-Trichlorobenzene	120-82-1	181.4	ND	0.50		ND	3.7	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	0.50		ND	5.3	
Naphthalene	91-20-3	128.2	ND	0.50		ND	2.6	
Total Target Compound Concentrations:			30	ppbv		67	ug/m3	

Surrogate
 4-Bromofluorobenzene

Result 9.4 **Spike** 10 **Recovery** 94%

Qualifier Definitions

ND = Non Detect
 B = Compound also found in method blank.
 E= Estimated concentration exceeding upper calibration range.
 D= Result reported from diluted analysis.
 J= Concentration estimated between Reporting Limit and MDL.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).



LA TESTING
 5431 Industrial Drive
 Huntington Beach, CA 92649
 Telephone: (714)828-4999 FAX: (714)828-4944
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EMSL ORDER ID: 332402243
 EMSL CUSTOMER ID: DAHL75
 EMSL SAMPLE ID: 332402243-0003
 CUSTOMER SAMPLE ID: BALLROOM 2

Attention: Sigrid Dahlberg
 Dahlberg Design
 222 Seward Street
 Suite 205
 Juneau, AK 99801-1239

Customer PO:
EMSL Project ID:
Project Name: CENTENNIAL HALL 2023

Phone: 907-723-8896
Email: sigrid@dahlberg.design

Collected: 01/31/2024 08:38
Received: 02/09/2024 10:25
Analyzed: See Results
Reported: 2/15/2024

Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	02/13/2024	HP	T2160.D	E15526	250 cc	1

NIOSH and OSHA Exposure Limit Comparisons

Target Compounds	Tox. Basis	CAS#	MW	Result ppbv	Q	Result ug/m3	NIOSH REL		OSHA PEL	
							ug/m3	>	ug/m3	>
Propylene	NC	115-07-1	42.08	ND		ND	N.E.		N.E.	
Freon 12(Dichlorodifluoromethane)	NC	75-71-8	120.9	0.69		3.4	4900000		4900000	
Freon 114(1,2-Dichlorotetrafluoroethan	--	76-14-2	170.9	ND		ND	7000000		7000000	
Chloromethane	NC	74-87-3	50.49	ND		ND	LFC		210000	
n-Butane	--	106-97-8	58.12	3.3		7.8	1900000		N.E.	
Vinyl chloride	C	75-01-4	62.50	ND		ND	LFC		2600	
1,3-Butadiene	C	106-99-0	54.09	ND		ND	LFC		2200	
Bromomethane	NC	74-83-9	94.94	ND		ND	LFC		78000	
Chloroethane	NC	75-00-3	64.51	ND		ND	LFC		2600000	
Ethanol	--	64-17-5	46.07	16		30	1900000		1900000	
Bromoethene(Vinyl bromide)	C	593-60-2	106.9	ND		ND	LFC		N.E.	
Freon 11(Trichlorofluoromethane)	--	75-69-4	137.4	ND		ND	5600000		5600000	
Isopropyl alcohol(2-Propanol)	NC	67-63-0	60.09	2.6		6.3	980000		980000	
Freon 113(1,1,2-Trichlorotrifluoroethan	NC	76-13-1	187.4	ND		ND	7700000		7700000	
Acetone	NC	67-64-1	58.08	5.0		12	590000		2400000	
1,1-Dichloroethene	NC	75-35-4	96.94	ND		ND	790000		N.E.	
Acetonitrile	NC	75-05-8	41.05	ND		ND	34000		67000	
Tertiary butyl alcohol(TBA)	--	75-65-0	74.12	ND		ND	300000		300000	
Bromoethane(Ethyl bromide)	--	74-96-4	109.0	ND		ND	880000		880000	
3-Chloropropene(Allyl chloride)	C	107-05-1	76.52	ND		ND	3100		3100	
Carbon disulfide	NC	75-15-0	76.14	ND		ND	3100		62000	
Methylene chloride	C	75-09-2	84.93	ND		ND	LFC		87000	
Acrylonitrile	C	107-13-1	53.08	ND		ND	2200		4300	
Methyl-tert-butyl ether(MTBE)	C	1634-04-4	88.15	ND		ND	N.E.		N.E.	
trans-1,2-Dichloroethene	--	156-60-5	96.94	ND		ND	790000		790000	
n-Hexane	NC	110-54-3	86.18	ND		ND	180000		1800000	
1,1-Dichloroethane	C	75-34-3	98.96	ND		ND	400000		400000	
Vinyl acetate	NC	108-05-4	86.09	ND		ND	14000		N.E.	
2-Butanone(MEK)	NC	78-93-3	72.11	ND		ND	590000		590000	
cis-1,2-Dichloroethene	--	156-59-2	96.94	ND		ND	790000		790000	
Ethyl acetate	NC	141-78-6	88.11	ND		ND	1400000		1400000	
Chloroform	C	67-66-3	119.4	ND		ND	9800		240000	
Tetrahydrofuran	NC	109-99-9	72.11	ND		ND	590000		590000	
1,1,1-Trichloroethane	NC	71-55-6	133.4	ND		ND	1900000		1900000	
Cyclohexane	NC	110-82-7	84.16	1.4		4.7	1000000		1000000	
2,2,4-Trimethylpentane(Isooctane)	--	540-84-1	114.2	ND		ND	N.E.		N.E.	
Carbon tetrachloride	C	56-23-5	153.8	ND		ND	13000		63000	
n-Heptane	NC	142-82-5	100.2	ND		ND	350000		2000000	
1,2-Dichloroethane	C	107-06-2	98.96	ND		ND	4000		200000	
Benzene	C	71-43-2	78.11	ND		ND	320		3200	
Trichloroethene	C	79-01-6	131.4	ND		ND	130000		540000	
1,2-Dichloropropane	C	78-87-5	113.0	ND		ND	LFC		350000	
Methyl Methacrylate	NC	80-62-6	100.1	ND		ND	410000		410000	
Bromodichloromethane	C	75-27-4	163.8	ND		ND	N.E.		N.E.	
1,4-Dioxane	C	123-91-1	88.11	ND		ND	3600		360000	
4-Methyl-2-pentanone(MIBK)	NC	108-10-1	100.2	ND		ND	200000		410000	
cis-1,3-Dichloropropene**	C	10061-01-5	111.0	ND		ND	4500		N.E.	



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Collected: 01/31/2024 08:38
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Analyzed: See Results
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Analysis Initial	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
	02/13/2024	HP	T2160.D	E15526	250 cc	1

NIOSH and OSHA Exposure Limit Comparisons

Target Compounds	Tox. Basis	CAS#	MW	Result ppbv	Q	Result ug/m3	NIOSH REL		OSHA PEL	
							ug/m3	>	ug/m3	>
Toluene	NC	108-88-3	92.14	ND		ND	380000		750000	
trans-1,3-Dichloropropene**	C	10061-02-6	111.0	ND		ND	4500		N.E.	
1,1,2-Trichloroethane	C	79-00-5	133.4	ND		ND	55000		55000	
2-Hexanone(MBK)	NC	591-78-6	100.2	ND		ND	4100		410000	
Tetrachloroethene	C	127-18-4	165.8	ND		ND	LFC		680000	
Dibromochloromethane	--	124-48-1	208.3	ND		ND	N.E.		N.E.	
1,2-Dibromoethane	C	106-93-4	187.9	ND		ND	350		150000	
Chlorobenzene	NC	108-90-7	112.6	ND		ND	N.E.		350000	
Ethylbenzene	C	100-41-4	106.2	ND		ND	430000		430000	
Xylene (p,m)	NC	1330-20-7	106.2	ND		ND	430000		430000	
Xylene (Ortho)	NC	95-47-6	106.2	ND		ND	430000		430000	
Styrene	NC	100-42-5	104.1	0.68		2.9	210000		430000	
Isopropylbenzene (cumene)	NC	98-82-8	120.2	ND		ND	250000		250000	
Bromoform	C	75-25-2	252.7	ND		ND	5200		5200	
1,1,2,2-Tetrachloroethane	C	79-34-5	167.9	ND		ND	6900		34000	
4-Ethyltoluene	--	622-96-8	120.2	ND		ND	N.E.		N.E.	
1,3,5-Trimethylbenzene	NC	108-67-8	120.2	ND		ND	120000		N.E.	
2-Chlorotoluene	--	95-49-8	126.6	ND		ND	260000		N.E.	
1,2,4-Trimethylbenzene	NC	95-63-6	120.2	ND		ND	120000		N.E.	
1,3-Dichlorobenzene	--	541-73-1	147.0	ND		ND	N.E.		N.E.	
1,4-Dichlorobenzene	C	106-46-7	147.0	ND		ND	LFC		450000	
Benzyl chloride	C	100-44-7	126.6	ND		ND	5200		5200	
1,2-Dichlorobenzene	NC	95-50-1	147.0	ND		ND	300000		300000	
1,2,4-Trichlorobenzene	NC	120-82-1	181.4	ND		ND	37000		N.E.	
Hexachloro-1,3-butadiene	C	87-68-3	260.8	ND		ND	210		N.E.	
Naphthalene	C	91-20-3	128.2	ND		ND	52000		52000	

**The concentrations of each isomer should be added if multiple isomers are present and compared to the total screening level.

The > column is used to flag exceedances as marked

Exposure Limit Definitions

REL= Recommended Exposure Limit, PEL= Permissible Exposure Limit

Compound Exposure Definitions

NE= No Limit Established NS= No Screening Value
 LFC= Lowest Feasible Concentration

Agency Definitions

NIOSH= The National Institute for Occupational Safety and Health

OSHA= Occupational Safety and Health Administration

Reference

Occupational Safety and Health Administration (OSHA) (2017) Air Contaminants. 29 CFR 1910.1000 [82 FR 2735, January 9, 2017].

Qualifier Definitions

B = Compound also found in method blank. ND = Non Detect
 E= Estimated concentration exceeding upper calibration range.
 D= Result reported from diluted analysis.
 J= Concentration estimated between Reporting Limit and MDL.

Carcinogenic (C) Exceedance

Value exceeds the theoretical risk that 1 additional case of cancer will occur in a population of 1 million than statistically expected.
 Thus is a theoretical risk and not an actual epidemiological one.

NonCarcinogenic (NC) Exceedance

Value exceeds the theoretical risk that 1 in a population of 100,000 will experience deleterious health effects.
 Thus is a theoretical risk and not an actual epidemiological one.

#332402243

TO-15 Sample Information

Please fill out this worksheet in addition to the Chain of Custody form. This information helps us to best analyze your samples, achieve requested TAT, and provide you with helpful interpretation information.

Company: DAHLBERG DESIGN

Contact Person:

Name: SIGRID DAHLBERG

E-mail: sigrid@dahlberg.design

Additional E-mails: sdahlberg907@gmail.com

Telephone #: 907.723.8896

Library Search requested: [] YES [] NO
A library search (aka Tentatively Identified Compounds) will identify up to 20 of the largest, non-target peaks that are not part of the standard TO-15 list of 74 compounds. If you are performing an Indoor Air Quality or odor investigation, the library search is recommended to provide you with all available information for your sample.

Sample Type:

[] Indoor Air Quality (Home/Office) [] Soil Gas/Sub Slab

[] IAQ (Industrial)

[x] Other: Public building / non-office

Sample Description: Reoccupancy sampling after renovation at convention center

PLEASE NOTE: The result forms we provide will not indicate whether your results have exceeded any Exposure Limit criteria established by any regulatory agency. If you would like that information, please check off below which regulatory comparison forms you would like to receive.

- [x] OSHA PELs/NIOSH RELs combined form [] Potential Sources of Compounds found in your IAQ sample
- [] EPA RSLs - 11/2022; default is THQ 0.1 Residential Industrial [] TVOC (Library Search Required for this format)
- [] EPA VISLs - 3/2012 IA/SG [] NH DES_WMD - 2/2013 Indoor Air Soil Gas
- [] NJ DEP - 5/2021 - Circle one: VI-Indoor AQ VI-Soil Gas [] Ohio - 5/2016 - Circle one: Residential Commercial
- [] NC DENR - 2/2018 - Circle one: Residential Non-residential [] Indiana Dept Env Mgmt Screening Levels - 3/2018
- [] PA DEP - 11/2016 Indoor Air [] Vermont DEC IROCP - 7/2017 (soil gas only)
- [] PA DEP - 11/2016: Sub Slab Soil Gas OR Near Source Soil Gas [] California OEHHA - 2/2012
- [] CA HHSL - 9/2010 - Circle one: Indoor Air Soil Gas [] Other; these are the compounds I want reported:

HP
02/13/24

Please note: There is an additional charge for any of the tests below. USEPA TO-3 AND ASTM 5504 analyses can be performed from your canister at the Cinnaminson NJ Laboratory.

*Very Important Information for Clients! Hold time for sulfur gases is 1 day from collection. Please schedule your sample collection so samples are received in the lab prior to noon on Friday. Analysis performed out of hold time will have a notation in the report.

US EPA TO-3 via GC/FID:

[] C1-C6 hydrocarbons

[] Methane only

ASTM-D5504 via GC/SCD: *

[] Sulfur Scan (H2S, COS, MeSH, EtSH, DMS)

[] H2S only

We can provide the following CMS tests from your canisters at the Cinnaminson and Huntington Beach laboratories. Please note these tests are to be used for IAQ/Screening purposes ONLY. EMSL recommends alternate field sampling techniques for these parameters (with the exception of water vapor); please contact your sales rep for the proper media. Please note: There is an additional charge for any of the tests below.

Draeger Analyzer:

[] CO [] CO2 [] NH3 [] O2 [] Water Vapor

Sample Retention Policy: All canisters are guaranteed to be retained for one day after results are reported. Please review your results promptly to ensure your project scope is fully addressed. Cans may be retained for a longer period of time, but arrangements to hold your cans must be made through your customer account representative quickly. Thank you.