GALLAGHER BASSETT SERVICES, INC.

IAQ ASSESSMENT

MARSHALL PUBLIC SCHOOL DISTRICT
MARSHALL HIGH SCHOOL
805 SOUTH MIAMI AVENUE
MARSHALL, MISSOURI

APRIL 10, 2022

PREPARED BY:

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1.0 INTRODUCTION

J.S. Held LLC (J.S. Held) was retained by Gallagher Bassett Services Inc. (Gallagher Bassett) to perform an indoor air quality (IAQ) assessment for Marshall Public School District at Marshall High School located at 805 South Miami Avenue in Marshall, Missouri. J.S. Held was retained to investigate the building due to employee health concerns after the building was cleaned by restoration contractor Servpro of Marshall after a reported fire in Room 4. Worker compensation complaints were also filed by several employees with the Marshall Public School District.

The IAQ assessment was performed on March 30, 2022 by Industrial Hygienist Mr. James Harvey and included the collection of air and surface samples for mold and combustion byproducts as well as laboratory samples and direct-reading measurements for volatile organic compounds (VOCs) and a visual assessment of the property.

Representative photographs collected during the assessment are provided in **Appendix A.** Ambient indoor data logs for VOC readings are included in **Appendix B**. VOC laboratory sample locations are provided on a diagram included in **Appendix C.** Combustion byproduct and mold sample location diagrams are included in **Appendices D and E**, respectively. Laboratory data for VOCs is included in **Appendix F** Combustion byproduct air and surface sample laboratory reports and chain of custody forms are provided in **Appendices G and H**. Mold surface sample laboratory report and chain of custody form are provided in **Appendix I.**

2.0 BACKGROUND

A fire reportedly occurred on November 17, 2021 in Room 4, an art room, at the Marshall High School. ServPro of Marshall (ServPro) mobilized equipment and containment to the school the following day, November 18, 2021to perform fire and smoke restoration activities at the site. J.S. Held performed a fire and smoke damage assessment approximately one month after the reported date of loss on December 21, 2021 with the specific purpose to determine the impact of the fire and smoke on the insulated metal walls within the building. A report of those findings was issued on February 24, 2022.

Servpro completed restoration and cleaning at some point during February 2022 after which the High School was reopened, and classes resumed. In March 2022 employees of the school started to express health concerns including development of a facial rash by one employee while unpacking contents from a box in Room 7.

3.0 OBSERVATIONS

The site is a public high school consisting primarily of two buildings connected by an entrance foyer hall; a 60,000 square-foot main building with classrooms and offices, and a second building with 40,000 square-foot which includes the school gymnasium, music rooms and theater, and a kitchen and commons area. J.S. Held's assessment included the larger main building where the fire occurred, and a limited section of the smaller building. The main building is a slab-on-grade structure with steel and wood framing, brick and concrete masonry unit (CMU) block walls, and a flat roof. Interior finishes include drywall ceilings and walls, metal partition walls, carpeting, and concrete flooring. J.S. Held conducted the assessment to determine potential IAQ contaminants within the main building that may be responsible for the health complaints reported by staff.

Suspended ceiling tiles and grids had been previously removed throughout the main building exposing roof decking and steel beams which appeared to have been painted. All finished had been removed from Room 4 which was being used to store content boxes. A section of carpet was observed to have been removed from the hallway adjacent to Room 4. Several of the classrooms contained Servpro boxes that were in the process of being emptied. Visual smoke damage was not observed at the time of J.S. Held's recent assessment.

4.0 DIRECT MEASUREMENT OF AMBIENT INDOOR CONDITIONS

Direct read instruments were used to collect data regarding Indoor Air Quality (IAQ) at the school, including for temperature, relative humidity, volatile organic compounds (VOCs) and ozone (O_3). , and Aeroqual Series 500,. Ambient air data logs for the ppbRae 3000 is attached as **Appendix B**.

4.1 Temperature and Relative Humidity (RH)

Many factors such as personal activity and clothing may affect personal comfort in a building. Generally, acceptable indoor levels for relative humidity should range from 20 to 60 percent (%). Maximum occupant comfort is normally achieved when relative humidity is between 30 to 50%. Normal temperature ranges considered are 68 to 75 degrees Fahrenheit (°F) in the winter and 73 to 79°F in the summer. These are normally associated with sedentary or slightly active individuals. Temperature and humidity readings were collected using a Kestrel thermal-hygrometer and were between 68.6 and 74.2 °F and 30.8 and 36.2 %, respectively. Industry standard guidelines recommend relative humidity within an occupied space should be maintained below 65% (The American Society of Heating, Refrigerating and Air-Conditioning Engineers) or 60% (EPA) to prevent an indoor environment conducive to mold growth. Based on these guidelines, relative humidity levels identified within the building are not conducive to mold growth.

4.2 Volatile Organic Compounds (VOCs)

Concentrations of many VOCs are consistently higher indoors (up to ten times higher) than outdoors. VOCs are emitted by a wide array of products numbering in the thousands. Examples include: adhesives, paints and lacquers, paint strippers, cleaning supplies, pesticides, building materials and furnishings, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions. VOCs concentrations are typically greater in buildings after new furnishings have been installed or after the building have been painted or renovated.

Real time VOC concentrations were measured for total VOCs during the assessment using a Honeywell ppbRae 3000 photoionization detection (PID) meter which was calibrated prior to use using calibration gas for isobutylene supplied by the manufacturer. Total VOC concentrations measured by the PID meter in the main building ranged from 340 to 1,000 parts per billion (ppb). An instantaneous peak reading of 19.43 parts per million (ppm) was measured within a content box in Room 7 which contained a bottle of hand sanitizer that had spilled. VOC concentrations measured by the PID meter in the gymnasium building were non-detectable at at 0 ppb.

Total VOC measurements are a composite of all VOCs present at the time and therefore cannot be compared to OSHA Permissible Exposure Limits (PELs) or ACGIH Threshold Limit Values (TLVs) for any specific individual VOC. The ppbRae 3000 measures VOCs in parts per billion (ppb). As PELs and TLVs for individual VOCs are in the part per million (ppm) range, and 1 ppm equals 1,000 ppb, measurement of total VOCs below 1,000 ppb are generally considered to be very low and safe.

4.3 Ozone (O_3)

As it was reported that hydroxyl machines, which can produce ozone (O_3), were used during restoration activities, J.S. Held collected ozone readings using a Aeroqual Series 500 portable ozone monitor. The Aeroqual 500 has a detection limit of 0.001 parts per million (ppm) ozone. Ozone readings collected throughout both the main building and gymnasium were non-detectable or less than 0.001ppm. The OSHA PEL for ozone is an average concentration of 0.10 ppm for 8-hours.

The observed levels of O_3 were within acceptable levels for building occupancy at the time of J.S. Held's assessment.

5.0 LABORATORY ANALYSIS OF AIR SAMPLES FOR VOLATILE ORGANIC COMPOUNDS (VOCs)

J.S. Held collected air samples for laboratory analysis of volatile organic compounds at the Marshall Public High School on March 30, 2022. Samples were also analyzed for microbial volatile organic compounds (MVOCs). A sample location diagram is included in **Appendix C** and laboratory analytical reports are included as **Appendix F**.

5.1 SAMPLING METHOD

J.S. Held collected a total of (10) air samples from within the property, nine (9) samples were collected from within the reportedly impacted main building and one (1) sample was collected for comparison purposed from the reportedly non-impacted gymnasium building, in order to evaluate for the presence of total VOCs, and MVOCs. The samples were collected using multi-matrix thermal desorption tubes attached to air sampling pumps supplied by and calibrated prior to sampling by the laboratory, Enthalpy Analytical LLC (Enthalpy). The samples were collected over a period of at least 2-hours at the required air flow rate of 200 milliliters of air per minute. The tubes were capped on both ends, inserted with padding into individual cardboard containers and secured with screw-top lids. The containers were shipped to Enthalpy under chain of custody. Enthalpy is an American Industrial Hygiene Association (AIHA) accredited testing laboratory, Laboratory ID #166272.

In the laboratory, the chemist can identify the types and amounts of volatile organic chemicals, or VOCs, collected in the air sample by thermally desorbing the chemicals off the tube and into a gas chromatograph where the retention times and peak amounts are compared to known standards. Enthalpy uses methods NIOSH 2549 and ISO 16000-6 for analysis of total and microbial organic chemicals.

5.2 CRITERIA FOR COMPARISON OF DATA

The test results for samples analyzed for VOCs will be compared to three criteria; the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), as well as a survey of homes conducted by the New York State Department of Health (NYS DOH). The PELs and TLVs provide acceptable exposures for person working 40-hours per week on either an 8-hour time-weighted averages (TWAs) basis or short-term exposure limits of usually 15 minutes (STELs). The NYS DOH survey provides typical levels of the chemicals in homes using home heating oil throughout New York and are therefore useful in comparing non-occupational exposures to the general public on a 24-hour per day, 365-day per year basis.

5.3 LABORATORY ANALYSIS

5.3.1 Total VOC's

Enthalpy analyzed each sample for total VOCs, or tVOCs. With the exception of the library, total VOC concentrations within the impacted area ranged from 3,800 nanograms per liter (ng/L) in Room 26 to 6,000 ng/L in Room 10. The sample collected in the library was reported to contain non-detectable amounts of VOCs, or less than 200 ng/L. The tVOC concentration within the non-impacted area,

specifically the hall outside of the little theater, was reported at 1,100 ng/L. Enthalpy then analyzed each of the sample tubes to obtain results for individual types of VOC's present. See list of chemical compounds on the laboratory data sheets included in **Appendix F**. A comparison table including the top five VOCs given in ng/L for all ten samples is provided below:

Compound/Room	***7***	***10***	***3***	***4***	***Library***	***26***	***Hall at Rooms 36 & 37***	***31***	***14***	***Hall at Little Theater***
Total VOC's	5,900	6,000	4,200	5,000	< 200	3,800	3,700	4,300	5,200	1,100
TO-17 Compounds										
Acetone	61.0	62.0	49.0	48.0	< 1.0	49.0	46.0	45.0	60.0	19.0
Ethanol	1,500.0	1,400.0	790.0	1,100.0	8.8	720.0	820.0	670.0	970.0	260.0
Ethylacetate	4.6	3.4	2.3	4.8	0.4	2	2.3	1.9	2.3	0.8
Isopropanol	150.0	120.0	130.0	110.0	< 1.0	44.0	45.0	49.0	100.00	11.00
Semi-Quantitative Compounds										
Acetaldehyde	60.0	60.0	22.0	33.0	< 4.0	20.0	26.0	52.0	22.0	< 4.0
Butane (C 4)	10.0	10.0	10.0	13.0	< 4.0	5.0	5.0	7.0	7.0	29.0
Dipropylene glycol methyl ether	420.0	450.0	240	320.0	< 4.0	270.0	190.0	330.0	300.0	15.0
Ethylene Glycol	57.0	53.0	73.0	58.0	< 4.0	43.0	91.0	41.0	56.0	< 4.0
Texanol-A	200.0	240.0	220.0	260.0	< 4.0	170.0	130.0	220.0	300.0	9.0
Texanol-B	250.0	300.0	280.0	330.0	< 4.0	230.0	170.0	270.0	390.0	19.0

The major VOCs found and identified above are typical ingredients found in either paints and/or common household cleaning products.

With the exception of the Library, only butane (C-4) was reported to be higher in concentration in the non-impacted gymnasium building when compared to the impacted main building. All other VOCs identified were higher in concentration in the impacted main building than the non-impacted gymnasium.

Review of the test results for all other VOCs found with lesser concentrations in the ten (10) samples revealed lower concentrations of the following fifty-one (51) compounds given in ng/L:

Compound/Room	*7*	*10*	*3*	*4*	*Library*	*26*	*Hall Rooms 36/37*	*31*	*14*	*Hall Little Theater*
TO-17 Compounds										
Acetonitrile	0.5	0.6	< 0.4	0.6	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Benzene	0.4	0.4	0.4	0.4	< 0.2	0.4	0.4	0.3	0.4	0.4
Carbon Tetrachloride	0.7	0.7	0.7	0.7	< 0.2	0.9	1.4	0.8	0.8	0.5
Chloroform	0.3	0.3	0.2	0.2	< 0.3	0.2	0.2	< 0.2	0.3	< 0.2
Cyclohexane	0.3	0.3	0.3	0.3	< 0.2	0.2	0.3	0.2	0.3	0.2
1,4-Dichlorobenzene	2.9	3.1	2.5	2.3	< 0.2	3.5	4.4	4.3	3.1	0.5
Ethylbenzene	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3
Hexane (C 6)	0.8	0.8	0.8	0.8	< 0.2	0.8	1.5	1.1	0.8	0.5
p-Isopropyltoluene	0.5	0.6	0.4	0.4	< 0.2	0.5	0.3	0.4	0.5	0.3
2-Methyl-1-propanol	< 0.2	< 0.2	0.9	0.8	< 0.2	< 0.2	< 0.2	1.0	0.8	0.8
4-Methyl-2-pentanone	1.6	2.2	1.3	1.3	< 0.2	2.9	1.1	1.3	1.9	1.0
Methylene Chloride	0.5	0.4	0.5	0.5	< 0.2	0.6	0.9	0.6	0.5	0.3
Naphthalene	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.4	0.7	0.5	< 0.4	< 0.4
Styrene	0.5	0.5	0.5	0.6	< 0.2	0.4	0.4	0.4	0.5	< 0.2
Toluene	3.4	3.3	3.1	3.6	< 0.2	3.1	3.6	3.3	3.3	1.3
Trichloro-trifluoroethane	0.5	0.5	0.5	0.5	< 0.2	0.5	0.5	0.5	0.6	0.6
1,2,4-Trimethylbenzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2
m,p-Xylene	1.1	1.1	0.9	1.1	< 0.4	0.9	1.0	1.0	1.0	0.8
o-Xylene	0.4	0.4	0.3	0.4	< 0.2	0.3	0.3	0.3	0.3	0.3
SEMI QUANTITATIVE COMPOUNDS										
2,6-Dimethyl-7-octen-2-ol	7.0	8.0	5.0	4.0	< 4.0	6.0	4.0	6.0	7.0	< 4.0
Benzaldehyde	7.0	7.0	5.0	6.0	< 4.0	5.0	5.0	7.0	6.0	< 4.0
1-Butanol	30.0	30.0	23.0	36.0	< 4.0	22.0	17.0	15.0	26.0	< 4.0
1-Butoxy-2-propanol	4.0	< 4.0	< 4.0	5.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
2-Butoxyethanol	22.0	24.0	17.0	26.0	< 4.0	16.0	13.0	23.0	24	< 4.0
Butoxyethoxyethanol	45.0	42.0	17.0	18.0	< 4.0	29.0	16.0	40.0	34.0	< 4.0
Butylcyclohexyl acetate	5.0	6.0	< 4.0	< 4.0	< 4.0	5.0	< 4.0	< 4.0	5.0	< 4.0
C12-C14 Hydrocarbon[1]	8.0	10.0	7	5.0	< 4.0	7.0	6.0	6.0	9.0	< 4.0
C12-C14 Hydrocarbon[2]	< 4.0	5.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
C14-C16 Hydrocarbon	< 4.0	< 4.0	4	< 4.0	< 4.0	< 4.0	10.0	< 4.0	< 4.0	< 4.0
C7-C9 Hydrocarbon	10.0	10.0	9	11	< 4.0	7.0	6.0	8.0	8.0	< 4.0
Decanal	< 4.0	6.0	5	< 4.0	< 4.0	7.0	9.0	14.0	7.0	< 4.0
Diethylene glycol ethyl ether	29.0	15.0	11	8.0	< 4.0	9.0	9.0	23.0	21.0	< 4.0
Dodecane (C 12)	8.0	8.0	6.0	7.0	< 4.0	6.0	5.0	8.0	7.0	< 4.0
2-Ethyl-1-hexanol	18.0	18.0	19.0	18.0	< 4.0	15.0	15.0	18.0	18.0	< 4.0
Isobutane	10.0	9.0	10.0	9.0	< 4.0	4.0	5.0	5.0	6.0	9.0
Isohexadecane	7.0	7.0	6.0	5.0	< 4.0	< 4.0	< 4.0	< 4.0	7.0	< 4.0
Isoprene	7.0	8.0	6.0	4.0	< 4.0	7.0	6.0	< 4.0	9.0	< 4.0
Limonene	50.0	70.0	23.0	22.0	< 4.0	25.0	17.0	21.0	42.0	8.0
Menthol	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	5.0	< 4.0	< 4.0	< 4.0
Methoxy-2-propanol	7.0	7.0	6.0	6.0	< 4.0	7.0	6.0	5.0	10.0	< 4.0
2-Methylbutane	6.0	5.0	5.0	6.0	< 4.0	< 4.0	< 4.0	< 4.0	5.0	4.0
Nonanal	5.0	5.0	< 4.0	6.0	< 4.0	< 4.0	5.0	13.0	< 4.0	< 4.0
Octamethylcyclotetrasiloxane	5.0	6.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	5.0	< 4.0
Pentane (C 5)	23.0	25.0	18.0	17.0	< 4.0	27.0	22.0	22.0	29.0	8.0
1-Propanol	7.0	6.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0

Compound/Room	*7*	*10*	*3*	*4*	*Library*	*26*	*Hall Rooms 36/37*	*31*	*14*	*Hall Little Theater*
n-Propylacetate	7.0	9.0	5.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	15.0	< 4.0
Propylene glycol	14.0	14.0	13.0	8.0	< 4.0	14.0	16.0	12.0	14.0	< 4.0
Tetradecane (C 14)	6.0	5.0	< 4.0	< 4.0	< 4.0	4.0	4.0	5.0	5.0	< 4.0
Tetramethyl-5-decyne-diol	34.0	47.0	12.0	9.0	< 4.0	30.0	17.0	8.0	20.0	< 4.0
Tridecane (C 13)	6.0	6.0	< 4.0	5.0	< 4.0	5.0	4.0	6.0	5.0	< 4.0
Urea	<4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	4.0	8.0	< 4.0	< 4.0

Excluding the sample collected within the library, all compounds were found to be higher or similar in concentration in the main building than in the non-impacted gymnasium. Fifteen (15) of the nineteen (19) TO-17 compounds identified in the samples collected from the main building were also reported in similar or lower concentrations in the sample collected in the gymnasium building.

Of the thirty-two (32) semi-quantitative compounds detected in the impacted main building only four (4), Isobutane, Limonene, 2-Methylbutane and Pentane (C 5), were also reported in the non-impacted sample collected from the gymnasium building. Concentrations of the four identified compounds in the gymnasium building, hall outside the little theater, were reported to be similar or lower than concentrations in the impacted main building. Many of those compounds, some of which are highlighted in bold in the above table, were found in higher amounts in the main building than in the control sample collected in the other building, for example, Limonene was between 22 and 70 ng/L in the main building but only 8 ng/L in the other building.

Summary **Tables 1 and 2** are included with the appendices.

Table 1 provides a comparison of these test results to levels found in a NYS DOH survey of homes, ACGIH TLVs and OSHA PEL's. While not all the chemicals analyzed by Enthalpy for the ten (10) samples collected within Marshall High School were included in the NYS DOH survey or have TLVs or PELs, for the chemicals analyzed by both groups, the chemicals listed in **Table 2** had concentrations above the amounts found in the NYS DOH survey for one or more of the ten (10) samples collected inside Marshall High School. Those chemicals are also identified in the below table. In all cases, all chemicals listed in the summary tables and laboratory data sheets were well below their respective TLVs and PELs by several orders of magnitude.

Chemical with concentrations above the NYS DOH Survey of Homes.

Compound / **Room**	3	4	7	10	14	26	31	Hall at 26/37
Carbon Tetrachloride								X
1,4-Dichlorobenzene	X	X	X	X	X	X	X	X
Ethanol			X	X				
4-Methyl-2-pentanone				X		X		
Limonene (d-Limonene)	X	X	X	X	X	X	X	X

5.3.2 Total Microbial VOCs

The laboratory also analyzed the test results for a sub-group of VOCs typically found during microbial growth and designated as microbial or mVOCs. Analysis of all ten (10) air samples were reported by the lab to contain amounts of mVOCs of 7 ng/L or less in the impacted main building and 5 ng/L in the non-impacted gymnasium building, which is below the level of concern of at least 8 ng/L (>8 ng/L) suggesting there is likely no concern for mold inside the buildings.

5.4 Conclusions

Based upon the results of the Enthalpy IAQ Comp-Air Survey sample analysis, the main building where the fire occurred appears to have been negatively impacted by VOCs when compared to the other smaller building.

The method used by the laboratory is very sensitive and therefore very low levels of many different VOCs were detected. The VOCs in greater amounts common to most of the rooms/areas tested in the main building, while still low at the time samples were collected, include several common ingredients, as follows:

Cleaning products
- ethanol
- acetone
- isopropyl alcohol (IPA)
- di-propylene glycol methyl ether
- ethylene glycol
- Limonene

Paints
- Texanol A
- Texanol B

Limonene, also known as di-pentene, is found in many cleaning products, including ServPro Orange Plus. In the presence of ozone Limonene has been reported to create formaldehyde, which unfortunately, the laboratory analysis does not include. Hydroxyl machines, which produce ozone, were used by ServPro to reduce smoke odors during their remediation of the building. While ozone was not detected in the building at the time samples for VOCs were collected, it may have been present at the time the hydroxyl machines were operating, and therefore formaldehyde may have been present in addition to the above reported VOCs.

The presence of Texanol chemicals may be from the paints and primers used to encapsulate the roof. These chemicals may cause eye, skin, and respiratory tract irritation.

It appears that the VOCs may have been absorbed into porous and semi-porous materials inside the rooms that were cleaned after the fire and were still in the process of off-gassing from those materials at the time the teachers returned to the building. While off-gassing is a normal process, the amounts of cleaning products used to ensure a clean environment may have required additional time to adequately ventilate the impacted areas, and perhaps not enough time to resume use of the building. Also, the use of the hydroxyl machines may have produced enough ozone at the time it was used to convert some of the di-pentene (Limonene) to a stronger irritant than the normally safer ingredients in those products.

In any case, additional ventilation with mild heat should reduce the amount of these VOCs over time. Negative-pressure exhaust ventilation can be used to hasten the process if necessary. Items cleaned and placed in boxes or other containers may have delayed the off-gassing of those items, and should be removed from containers (by properly protected individuals donning half-face organic vapor/acid gas cartridge respirators and gloves) to allow for improved dissipation of those chemicals. Use of additional cleaning products is not recommended at this time.

6.0 COMBUSTION BYPRODUCT SAMPLING

As it was reported that Servpro performed fire and smoke restoration and cleaning within Marshall High School and employees were reporting health concerns, a post restoration verification sampling and analysis strategy was developed to determine whether air and surfaces were cleaned of combustion byproducts properly and completely. Air and surface sampling was conducted for combustion byproducts (soot, char, and ash) to determine impact on air and building materials from these compounds and to determine if restoration cleaning is complete.

6.1 Combustion Byproduct Information

Combustion byproducts are defined by the analytical laboratory to be those materials that are consistent in morphology (i.e., structure) with soot, char, and/or ash.

Soot
Black Carbon (soot) is defined as a randomly formed particulate of carbon, commonly with a spherical to pseudo-spherical (aciniform) morphology. It is a by-product of uncontrolled combustion.

Char
Char is defined as the layer of black particulate resulting from the burning of organic material which retains the morphology of the original substance.

Ash
Ash is defined as the white outermost layer resulting from the burning of organic material with only slight remains of the original morphology detectable.

6.2 Combustion Byproduct Evaluation Criteria

As there are no regulations regarding the concentration of soot, char or ash impact levels on surfaces, J.S. Held utilizes multiple criteria in the review of the data to evaluate the samples for impact, including the following: laboratory provided criteria, identification of and concentration of particulates on the sample, review of concentrations of each component against each other, source location of the fire and combustion byproducts, other potential sources of combustion byproducts (background), visual observations and location of samples that were collected, as well as potential for continued impact from identified sources.

The following criteria provided by the laboratory, Environmental Analysis Associates, Inc. (EAA), is utilized as a preliminary screening tool, which assists in the determination and presence and extent of surface impact based on soot, char, or ash concentrations.

Ratio (%) and Surface Concentration		
Classification (Impact)	**Total Fire Residue (Ratio %)**	**Total Fire Residue (ct/mm^2)**
Typical – Low	<1%	<1
Typical – Upper Background	1 – 3%	1 – 5
Atypical	3 – 10%	5 – 50
Elevated	>10%	>50

The impact of dust loading is important in the evaluation of samples. For the interpretation of the results, the total ratio percent results column is utilized when there is heavy dust loading and/or long-term settled dust. If dust loading is not considered, the percent ratio of the result between the fire residue and the dust loading would be skewed in the total ratio percent column. With samples with light loading, the counts per millimeter square (ct/ mm^2) are to be used. In addition to the dust loading, the normal

background (i.e. what is normally found inside of buildings) is also considered during the evaluation of samples results. Background concentrations are typically found inside of buildings, due to multiple sources/influences within in the building and rural communities. Typical sources include, but are not limited to, candle burning, cooking, incense burning, and outdoor pollutants. For the purpose of this project, samples with surface concentrations above Typical – Upper Background are considered elevated.

Additionally, there are no limits regulating the presence of airborne combustion byproducts, with the exception for soot which is regulated by the U.S. Environmental Protection Agency at a limit of 15 micrograms per cubic meter ($\mu g/m^3$). The following criteria provided by the laboratory, EAA, is utilized as a preliminary screening tool, which assists in the determination and presence and extent of airborne soot, char, or ash concentrations.

Percentile (%) and Airborne Concentration		
Classification (Impact)	**Percentile Frequency of Occurrence (Percentile %)**	**Total Fire Residue (cts/m^3)**
Typical – Low	<50%	<100
Typical – Upper Background	>50%	>100
Atypical	>75%	>300
Elevated	>95%	>1,000

6.3 Combustion Byproduct Sample Collection

J.S. Held developed the following sampling strategy to assess building material surfaces and air quality within the building.

Targeted Sampling:
Locations identified for surface sample collection by J.S. Held were selected based on the following criteria:

1. The area's proximity to the fire;
2. Surfaces where soot, debris, and other environmental dust would typically collect;
3. Areas where visible dust and debris were present (indicating the area had not been cleaned for some time and therefore any soot or other environmental dust that may be attributed to the fire event may still be present); and
4. Contents within Servpro boxes as it was reported that during the unpacking of one of the boxes an employee developed a rash.
5. Rooms of employees expressing concern over health issues.

Surface samples were collected utilizing Bio-Tape™ tape lifts inserted into a rigid plastic container, placed individually into plastic bags and sealed, recorded onto a chain of custody, and shipped by courier to EAA located in Bay City, Michigan. EAA is an American Industrial Hygiene Association (AIHA) accredited laboratory for analysis, which includes Polarized Light Microscopy (PLM) and Reflected Light Microscopy. A total of seventeen (17) surface samples were collected and submitted for laboratory analysis.

Airborne fire residue samples were collected utilizing Air-O-Cell (AOC) cassettes, recorded onto a chain of custody, and shipped by courier to EAA located in Bay City, Michigan. The fire residue air quality sampler is a particulate sampling cassette designed for the rapid collection and analysis of a wide range of airborne aerosols, which includes combustion byproducts. Samples were collected with the SKC Quick Take pump at a flow rate of approximately 15 liters per minute (lpm). A total of ten (10) air samples were collected and submitted for laboratory analysis.

A sample location diagram is included in **Appendix D** and air and surface laboratory analytical reports and associated chain of custody are in **Appendices G and H**, respectively.

6.4 Combustion Byproduct Sample Results and Conclusions

Analytical results for the twenty (20) surface samples and ten (10) air samples were reviewed by J.S. Held's Certified Industrial Hygienist (CIH). The results indicate that nineteen (19) of the twenty (20) surface samples were at or below Typical – Upper Background levels, and all of the ten (10) air samples were below Typical – Low Background. Combustion byproducts were not observed qualitatively by the laboratory in any of the twenty (20) surface samples collected. High concentrations of surface dust were not identified in any of the twenty (20) surface samples collected.

The following surface samples were reported above Typical – Upper Background based on the laboratory analytical report:

- Sample B-8 – Room 7 – Contents in Servpro Box.

All of the air samples were reported to be below Typical – Low Background based on the laboratory analytical report.

Results of J.S. Held's combustion byproduct sampling, which was conducted after restoration and cleaning was completed, indicated only limited smoke impact may remain on some contents within ServPro boxes.

7.0 MOLD SAMPLE COLLECTION

J.S. Held collected surface samples for mold. The samples were collected to determine whether an amplification of mold spores existed within the property. All samples were submitted to EMLab P&K, LLC (EMLab) in Phoenix, Arizona for analysis. EMLab is accredited by the American Industrial Hygiene Association's Laboratory Accreditation Program, LLC (AIHA-LAP, LLC) and is a participant in the Environmental Microbiology Laboratory Accreditation Program (EMLAP), (Lab ID 102297). Samples collected for surface mold included tape lift samples. Sample location diagrams for mold surface samples collected is included in **Appendix E.**

7.1 Surface Mold Sample Collection

J.S. Held collected seven (7) surface samples for mold to determine whether carpets were impacted with fungal growth as a result of water from fire suppression activities. The tape and slide are evaluated for characteristic mold spores under the microscope for type and amount of mold growth identified.

7.1.1 Surface Mold Sample Collection and Analysis

The surface tape sample was collected by pressing the sterile surface of a slide containing light adhesive to the surface of the wall and then enclosing the sample in its own locking case. Disposable gloves were worn during collection and containerizing of the sample. The surface sample was submitted under chain of custody and shipped to EMLab. Samples were analyzed by EMLab Service SOP: Direct microscopic exam (Quantitative) (EM-MY-S-1041).

7.1.2 Recommended Standards for Mold Spores on Surfaces

Currently, there are no specific state or federal standards for concentrations of mold spores. J.S. Held utilizes guidance from articles published in a journal of the AIHA, *The Synergist*, which was updated in 2003, that identifies normal background levels for surface mold. Concentrations of mold spores above these recommended guidelines for normal background are considered elevated and could indicate mold impact:

- Total spore count of 1,500 spore/cm^2 or 10,000 spores/in^2;
- Spore counts of 750 spores/cm^2 or 5,000 spores/in^2 of *Aspergillus/Penicillium*; and
- Spore counts of approximately 2 spores/cm^2 or 100 spores/in^2 for water indicator species, *Chaetomium, Memnoniella, Trichoderma,* and *Stachybotrys*.

7.1.3 Review of Mold Surface Sample Analytical Results

Analytical results from the surface tape lift samples were reviewed by J.S. Held's Certified Industrial Hygienist (CIH). Of the seven (7) samples collected, all results were below established criteria for *Aspergillus/Penicillium* mold spores and no spores for water indicator species, *Chaetomium, Memnoniella, Trichoderma,* and *Stachybotrys* were reported by the laboratory in any of the seven samples collected. Analytical laboratory reports are included in **Appendix I.**

7.1.4 Mold Surface Sample Conclusions

The laboratory results from the seven (7) surface mold samples confirm that the carpets contain concentrations of mold spores considered to be normal background based on recommended guidelines.

8.0 LIMITATIONS

J.S. Held documented property conditions "as-is" during the assessment on March 30, 2022. Recommendations provided in this report are based upon the condition of the areas reported to be impacted as evaluated at the time of the assessment.

9.0 CONCLUSIONS

J.S. Held was retained by Gallagher Bassett to perform an indoor air quality (IAQ) assessment for the Marshall Public School District at the Marshall High School located at 805 South Miami Avenue in Marshall, Missouri. The assessment was conducted to assess a potential indoor air quality concern after fire and smoke restoration was performed. The assessment was performed on March 30, 2022, by Industrial Hygienist Mr. James Harvey. The assessment included a visual inspection, the collection of digital photographs to document general conditions, the collection of fungal surface samples, ambient air measurements for temperature and humidity, combustion byproduct air and surface sampling, real-time measurement of ozone and volatile organic compounds (VOCs), and the collection of air samples for VOCs.

Based on the assessment and sampling performed, VOC levels were higher in the impacted areas, in the main building, than in the non-impact building, and may be the result of cleaning products as well as paints and primers used during remediation. While five (5) of these VOCs were found in the impacted building in concentrations above the NYS DOH survey of homes, all air concentrations of all VOCs were found by the laboratory to be well within both their respective OSHA PELs as well as their ACGIH TLVs, by orders of magnitude.

The surface sampling for combustion by-products indicates the possible presence of soot above Typical – Upper Background concentrations on some of the contents within some of the boxes.

10.0 RECOMMENDATIONS

J.S. Held recommends additional ventilation with mild heat to reduce the airborne concentration of VOCs. Negative-pressure exhaust ventilation can be used to hasten the process if necessary. Items cleaned and placed in boxes should be removed from containers by properly protected individuals donning organic vapor/acid gas cartridge respirators and gloves to allow for improved dissipation of those chemicals. Contents removed from boxes should be HEPA vacuumed to remove any soot.

APPENDICES

APPENDIX A

PHOTOGRAPHS

Figure (1) – Overview of Room 7.

Figure (2) – Combustion byproduct air sample –A-1 room 7.

Figure (3) – PID Meter measurement of 929 parts per billion (ppb) room 7.

Figure (4) – Leaking bottle of hand sanitizer located in ServPro contents box within room 7.

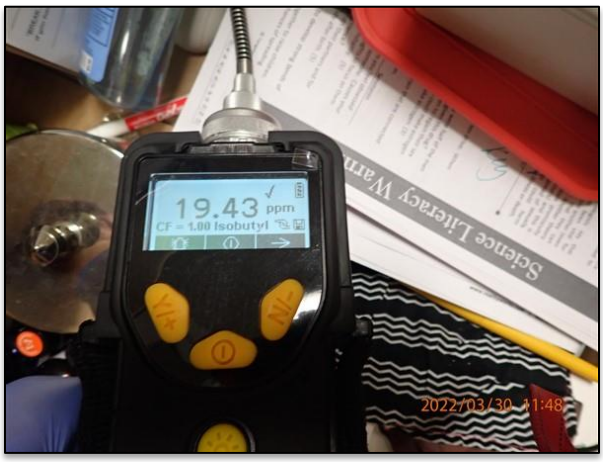

Figure (5) –PID Meter measurement within contents box with hand sanitizer 19.43 parts per million (ppm).

Figure (6) – Comp-Air sample set-up within room 10.

Figure (7) – Painted exposed ceiling deck and steel above Room 3.

Figure (8) – Ozone monitor reading of 0.000 ppm in Room 3.

Figure (9) – Contents boxes stored in Room 4.

Figure (10) – HVAC duct above Room 4 covered with polyethylene sheeting.

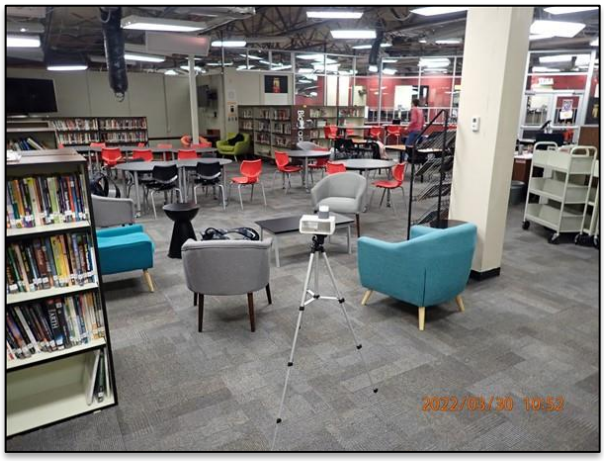

Figure (11) – CBP air sample in library.

Figure (12) – PID Meter measurement of 388 parts per billion (ppb) library.

Figure (13) – Comp-Air sample in Library.

Figure (14) – Comp-Air sample Room 26.

Figure (15) – PID Meter measurement of 478 ppb in Room 26.

Figure (16) – PID meter reading of 0 ppb in corridor between main building and gymnasium building.

Figure (17) – Comp-Air sample Room 31.

Figure (18) – Sample B-1 – Collected from carpet in Room 7.

Figure (19) – Sample B-3 – Collected from carpet in Room 26.

Figure (20) – Sample C-5 – Collected from Library carpet.

Figure (21) – Sample B-8 – Collected from contents in box within Room 7.

Figure (22) – Sample B-10 – Collected from content box within Room 10.

Figure (23) – Sample B-12 – Collected from contents within box in Room 4.

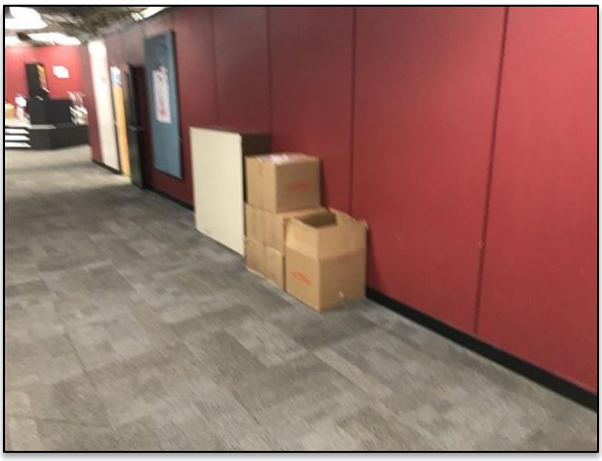

Figure (24) – Storage boxes in Southeast hallway.

Figure (25) – CBP air sample and Comp Survey analysis samples collected in SE Hallway.

Figure (26) – Ozone meter measurement of 0 ppm collected from within Library.

Figure (27) – Content storage boxes in Room 26.

Figure (28) – CBP sample and Comp-Air sample collected in hall outside of little theatre in gymnasium building.

Figure (29) – Sample B-16 – Collected from top of cabinet in Room 31.

Figure (30) – Sample B-18 collected from contents in storage box within Mrs. Simms Room.

APPENDIX B

PPB RAE 3000 DATA

```
============================================================
22/03/30 12:02
************************************************************
Summary
------------------------------------------------------------
Unit Name       ppbRAE 3000(PGM-7340)
Unit SN 594-906685
Unit Firmware Ver       V2.22A
------------------------------------------------------------
Running Mode    Hygiene Mode
Datalog Mode    Auto
Diagnostic Mode No
Stop Reason     Pause in Communication Mode
------------------------------------------------------------
Site ID RAE00000
User ID USER0000
------------------------------------------------------------
Begin   3/30/2022 12:02:38
End     3/30/2022 12:17:25
Sample Period(s)        60
Number of Records       14
------------------------------------------------------------
Sensor  PID(ppb)
Sensor SN       S023030311W6
Measure Type    Avg
Span    10000
Span 2  1000000
Low Alarm       50000
High Alarm      100000
Over Alarm      10000000
STEL Alarm      100000
TWA Alarm       50000
Measurement Gas Isobutylene
Calibration Time        3/29/2022 16:06
Peak    N/A
Min     N/A
Average N/A

************************************************************
Datalog
                PID(ppb)
Index   Date/Time       (Avg)
001     3/30/2022 12:03:38      662
002     3/30/2022 12:04:38      890
003     3/30/2022 12:05:38      1063
004     3/30/2022 12:06:38      943
005     3/30/2022 12:07:38      956
006     3/30/2022 12:08:38      955
007     3/30/2022 12:09:38      965
008     3/30/2022 12:10:38      950
```

009 3/30/2022 12:11:38 947
010 3/30/2022 12:12:38 946
011 3/30/2022 12:13:38 947
012 3/30/2022 12:14:38 942
013 3/30/2022 12:15:38 945
014 3/30/2022 12:16:38 996
Peak 1063
Min 662
Average 936

==========
22/03/30 12:18
****
Summary

Unit Name ppbRAE 3000(PGM-7340)
Unit SN 594-906685
Unit Firmware Ver V2.22A

Running Mode Hygiene Mode
Datalog Mode Auto
Diagnostic Mode No
Stop Reason Pause in Communication Mode

Site ID RAE00000
User ID USER0000

Begin 3/30/2022 12:18:43
End 3/30/2022 12:23:52
Sample Period(s) 60
Number of Records 5

Sensor PID(ppb)
Sensor SN S023030311W6
Measure Type Avg
Span 10000
Span 2 1000000
Low Alarm 50000
High Alarm 100000
Over Alarm 10000000
STEL Alarm 100000
TWA Alarm 50000
Measurement Gas Isobutylene
Calibration Time 3/29/2022 16:06
Peak N/A
Min N/A
Average N/A

****
Datalog

Index	Date/Time	PID(ppb) (Avg)
001	3/30/2022 12:19:43	673
002	3/30/2022 12:20:43	663
003	3/30/2022 12:21:43	671
004	3/30/2022 12:22:43	684
005	3/30/2022 12:23:43	673
Peak		684
Min		663
Average		673

==========
22/03/30 12:26
****
Summary

Unit Name ppbRAE 3000(PGM-7340)
Unit SN 594-906685
Unit Firmware Ver V2.22A

Running Mode Hygiene Mode
Datalog Mode Auto
Diagnostic Mode No
Stop Reason Pause in Communication Mode

Site ID RAE00000
User ID USER0000

Begin 3/30/2022 12:26:14
End 3/30/2022 12:33:16
Sample Period(s) 60
Number of Records 7

Sensor PID(ppb)
Sensor SN S023030311W6
Measure Type Avg
Span 10000
Span 2 1000000
Low Alarm 50000
High Alarm 100000
Over Alarm 10000000
STEL Alarm 100000
TWA Alarm 50000
Measurement Gas Isobutylene
Calibration Time 3/29/2022 16:06
Peak N/A
Min N/A
Average N/A

****

Datalog

Index	Date/Time	PID(ppb) (Avg)
001	3/30/2022 12:27:14	569
002	3/30/2022 12:28:14	573
003	3/30/2022 12:29:14	599
004	3/30/2022 12:30:14	606
005	3/30/2022 12:31:14	608
006	3/30/2022 12:32:14	632
007	3/30/2022 12:33:14	681
Peak		681
Min		569
Average		610

==========
22/03/30 12:36
****
Summary

Unit Name ppbRAE 3000(PGM-7340)
Unit SN 594-906685
Unit Firmware Ver V2.22A

Running Mode Hygiene Mode
Datalog Mode Auto
Diagnostic Mode No
Stop Reason Pause in Communication Mode

Site ID RAE00000
User ID USER0000

Begin 3/30/2022 12:36:35
End 3/30/2022 12:42:36
Sample Period(s) 60
Number of Records 6

Sensor PID(ppb)
Sensor SN S023030311W6
Measure Type Avg
Span 10000
Span 2 1000000
Low Alarm 50000
High Alarm 100000
Over Alarm 10000000
STEL Alarm 100000
TWA Alarm 50000
Measurement Gas Isobutylene
Calibration Time 3/29/2022 16:06
Peak N/A
Min N/A

Average N/A

****
Datalog

Index	Date/Time	PID(ppb) (Avg)
001	3/30/2022 12:37:35	448
002	3/30/2022 12:38:35	385
003	3/30/2022 12:39:35	388
004	3/30/2022 12:40:35	386
005	3/30/2022 12:41:35	394
006	3/30/2022 12:42:35	422
Peak		448
Min		385
Average		404

==========
22/03/30 12:45
****
Summary

Unit Name	ppbRAE 3000(PGM-7340)
Unit SN	594-906685
Unit Firmware Ver	V2.22A
Running Mode	Hygiene Mode
Datalog Mode	Auto
Diagnostic Mode	No
Stop Reason	Pause in Communication Mode
Site ID	RAE00000
User ID	USER0000
Begin	3/30/2022 12:45:01
End	3/30/2022 12:49:57
Sample Period(s)	60
Number of Records	4
Sensor	PID(ppb)
Sensor SN	S023030311W6
Measure Type	Avg
Span	10000
Span 2	1000000
Low Alarm	50000
High Alarm	100000
Over Alarm	10000000
STEL Alarm	100000
TWA Alarm	50000
Measurement Gas	Isobutylene
Calibration Time	3/29/2022 16:06

Peak N/A
Min N/A
Average N/A

****
Datalog

Index	Date/Time	PID(ppb) (Avg)
001	3/30/2022 12:46:01	511
002	3/30/2022 12:47:01	523
003	3/30/2022 12:48:01	525
004	3/30/2022 12:49:01	518
Peak		525
Min		511
Average		519

==========
22/03/30 12:52
****
Summary

Unit Name ppbRAE 3000(PGM-7340)
Unit SN 594-906685
Unit Firmware Ver V2.22A

Running Mode Hygiene Mode
Datalog Mode Auto
Diagnostic Mode No
Stop Reason Pause in Communication Mode

Site ID RAE00000
User ID USER0000

Begin 3/30/2022 12:52:15
End 3/30/2022 13:24:32
Sample Period(s) 60
Number of Records 32

Sensor PID(ppb)
Sensor SN S023030311W6
Measure Type Avg
Span 10000
Span 2 1000000
Low Alarm 50000
High Alarm 100000
Over Alarm 10000000
STEL Alarm 100000
TWA Alarm 50000
Measurement Gas Isobutylene
Calibration Time 3/29/2022 16:06

Peak N/A
Min N/A
Average N/A

****

Datalog

Index	Date/Time	PID(ppb) (Avg)
001	3/30/2022 12:53:15	405
002	3/30/2022 12:54:15	362
003	3/30/2022 12:55:15	124
004	3/30/2022 12:56:15	364
005	3/30/2022 12:57:15	899
006	3/30/2022 12:58:15	1813
007	3/30/2022 12:59:15	863
008	3/30/2022 13:00:15	806
009	3/30/2022 13:01:15	548
010	3/30/2022 13:02:15	399
011	3/30/2022 13:03:15	437
012	3/30/2022 13:04:15	494
013	3/30/2022 13:05:15	403
014	3/30/2022 13:06:15	487
015	3/30/2022 13:07:15	498
016	3/30/2022 13:08:15	501
017	3/30/2022 13:09:15	499
018	3/30/2022 13:10:15	501
019	3/30/2022 13:11:15	499
020	3/30/2022 13:12:15	493
021	3/30/2022 13:13:15	499
022	3/30/2022 13:14:15	475
023	3/30/2022 13:15:15	528
024	3/30/2022 13:16:15	554
025	3/30/2022 13:17:15	558
026	3/30/2022 13:18:15	679
027	3/30/2022 13:19:15	830
028	3/30/2022 13:20:15	844
029	3/30/2022 13:21:15	855
030	3/30/2022 13:22:15	849
031	3/30/2022 13:23:15	849
032	3/30/2022 13:24:15	842
Peak		1813
Min		124
Average		617

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22/03/30 13:29

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Summary

Unit Name ppbRAE 3000(PGM-7340)

Unit SN 594-906685
Unit Firmware Ver V2.22A

Running Mode Hygiene Mode
Datalog Mode Auto
Diagnostic Mode No
Stop Reason Pause in Communication Mode

Site ID RAE00000
User ID USER0000

Begin 3/30/2022 13:29:49
End 3/30/2022 13:44:49
Sample Period(s) 60
Number of Records 14

Sensor PID(ppb)
Sensor SN S023030311W6
Measure Type Avg
Span 10000
Span 2 1000000
Low Alarm 50000
High Alarm 100000
Over Alarm 10000000
STEL Alarm 100000
TWA Alarm 50000
Measurement Gas Isobutylene
Calibration Time 3/29/2022 16:06
Peak N/A
Min N/A
Average N/A

****

Datalog

Index	Date/Time	PID(ppb) (Avg)
001	3/30/2022 13:30:49	1298
002	3/30/2022 13:31:49	781
003	3/30/2022 13:32:49	778
004	3/30/2022 13:33:49	2778
005	3/30/2022 13:34:49	795
006	3/30/2022 13:35:49	789
007	3/30/2022 13:36:49	790
008	3/30/2022 13:37:49	790
009	3/30/2022 13:38:49	894
010	3/30/2022 13:39:49	810
011	3/30/2022 13:40:49	805
012	3/30/2022 13:41:49	812
013	3/30/2022 13:42:49	808
014	3/30/2022 13:43:49	800

Peak 2778
Min 778
Average 981

==========
22/03/30 13:53
****
Summary

Unit Name ppbRAE 3000(PGM-7340)
Unit SN 594-906685
Unit Firmware Ver V2.22A

Running Mode Hygiene Mode
Datalog Mode Auto
Diagnostic Mode No
Stop Reason Pause in Communication Mode

Site ID RAE00000
User ID USER0000

Begin 3/30/2022 13:53:52
End 3/30/2022 14:35:37
Sample Period(s) 60
Number of Records 41

Sensor PID(ppb)
Sensor SN S023030311W6
Measure Type Avg
Span 10000
Span 2 1000000
Low Alarm 50000
High Alarm 100000
Over Alarm 10000000
STEL Alarm 100000
TWA Alarm 50000
Measurement Gas Isobutylene
Calibration Time 3/29/2022 16:06
Peak N/A
Min N/A
Average N/A

****
Datalog

Index	Date/Time	PID(ppb) (Avg)
001	3/30/2022 13:54:52	503
002	3/30/2022 13:55:52	647
003	3/30/2022 13:56:52	762
004	3/30/2022 13:57:52	749

005	3/30/2022	13:58:52	716
006	3/30/2022	13:59:52	702
007	3/30/2022	14:00:52	387
008	3/30/2022	14:01:52	0
009	3/30/2022	14:02:52	0
010	3/30/2022	14:03:52	0
011	3/30/2022	14:04:52	0
012	3/30/2022	14:05:52	0
013	3/30/2022	14:06:52	0
014	3/30/2022	14:07:52	283
015	3/30/2022	14:08:52	462
016	3/30/2022	14:09:52	500
017	3/30/2022	14:10:52	520
018	3/30/2022	14:11:52	703
019	3/30/2022	14:12:52	744
020	3/30/2022	14:13:52	741
021	3/30/2022	14:14:52	747
022	3/30/2022	14:15:52	748
023	3/30/2022	14:16:52	736
024	3/30/2022	14:17:52	737
025	3/30/2022	14:18:52	746
026	3/30/2022	14:19:52	743
027	3/30/2022	14:20:52	731
028	3/30/2022	14:21:52	744
029	3/30/2022	14:22:52	736
030	3/30/2022	14:23:52	743
031	3/30/2022	14:24:52	747
032	3/30/2022	14:25:52	743
033	3/30/2022	14:26:52	742
034	3/30/2022	14:27:52	734
035	3/30/2022	14:28:52	737
036	3/30/2022	14:29:52	726
037	3/30/2022	14:30:52	741
038	3/30/2022	14:31:52	732
039	3/30/2022	14:32:52	731
040	3/30/2022	14:33:52	724
041	3/30/2022	14:34:52	722
Peak		762	
Min		0	
Average		583	

==========
22/03/30 14:47
****
Summary

Unit Name ppbRAE 3000(PGM-7340)
Unit SN 594-906685
Unit Firmware Ver V2.22A

Running Mode Hygiene Mode
Datalog Mode Auto
Diagnostic Mode No
Stop Reason Pause in Communication Mode

Site ID RAE00000
User ID USER0000

Begin 3/30/2022 14:47:58
End 3/30/2022 17:10:37
Sample Period(s) 60
Number of Records 142

Sensor PID(ppb)
Sensor SN S023030311W6
Measure Type Avg
Span 10000
Span 2 1000000
Low Alarm 50000
High Alarm 100000
Over Alarm 10000000
STEL Alarm 100000
TWA Alarm 50000
Measurement Gas Isobutylene
Calibration Time 3/29/2022 16:06
Peak N/A
Min N/A
Average N/A

****

Datalog

Index	Date/Time	PID(ppb) (Avg)
001	3/30/2022 14:48:58	592
002	3/30/2022 14:49:58	640
003	3/30/2022 14:50:58	633
004	3/30/2022 14:51:58	643
005	3/30/2022 14:52:58	636
006	3/30/2022 14:53:58	633
007	3/30/2022 14:54:58	654
008	3/30/2022 14:55:58	673
009	3/30/2022 14:56:58	655
010	3/30/2022 14:57:58	655
011	3/30/2022 14:58:58	659
012	3/30/2022 14:59:58	656
013	3/30/2022 15:00:58	657
014	3/30/2022 15:01:58	644
015	3/30/2022 15:02:58	647
016	3/30/2022 15:03:58	648
017	3/30/2022 15:04:58	650

018	3/30/2022	15:05:58	652
019	3/30/2022	15:06:58	662
020	3/30/2022	15:07:58	664
021	3/30/2022	15:08:58	672
022	3/30/2022	15:09:58	662
023	3/30/2022	15:10:58	656
024	3/30/2022	15:11:58	671
025	3/30/2022	15:12:58	657
026	3/30/2022	15:13:58	665
027	3/30/2022	15:14:58	664
028	3/30/2022	15:15:58	672
029	3/30/2022	15:16:58	668
030	3/30/2022	15:17:58	668
031	3/30/2022	15:18:58	678
032	3/30/2022	15:19:58	680
033	3/30/2022	15:20:58	682
034	3/30/2022	15:21:58	678
035	3/30/2022	15:22:58	680
036	3/30/2022	15:23:58	682
037	3/30/2022	15:24:58	683
038	3/30/2022	15:25:58	687
039	3/30/2022	15:26:58	690
040	3/30/2022	15:27:58	687
041	3/30/2022	15:28:58	688
042	3/30/2022	15:29:58	687
043	3/30/2022	15:30:58	682
044	3/30/2022	15:31:58	680
045	3/30/2022	15:32:58	679
046	3/30/2022	15:33:58	678
047	3/30/2022	15:34:58	676
048	3/30/2022	15:35:58	674
049	3/30/2022	15:36:58	678
050	3/30/2022	15:37:58	675
051	3/30/2022	15:38:58	676
052	3/30/2022	15:39:58	674
053	3/30/2022	15:40:58	670
054	3/30/2022	15:41:58	667
055	3/30/2022	15:42:58	667
056	3/30/2022	15:43:58	664
057	3/30/2022	15:44:58	666
058	3/30/2022	15:45:58	669
059	3/30/2022	15:46:58	667
060	3/30/2022	15:47:58	669
061	3/30/2022	15:48:58	668
062	3/30/2022	15:49:58	672
063	3/30/2022	15:50:58	671
064	3/30/2022	15:51:58	675
065	3/30/2022	15:52:58	675
066	3/30/2022	15:53:58	667
067	3/30/2022	15:54:58	664

068	3/30/2022	15:55:58	668
069	3/30/2022	15:56:58	666
070	3/30/2022	15:57:58	671
071	3/30/2022	15:58:58	668
072	3/30/2022	15:59:58	665
073	3/30/2022	16:00:58	671
074	3/30/2022	16:01:58	663
075	3/30/2022	16:02:58	644
076	3/30/2022	16:03:58	649
077	3/30/2022	16:04:58	653
078	3/30/2022	16:05:58	649
079	3/30/2022	16:06:58	643
080	3/30/2022	16:07:58	646
081	3/30/2022	16:08:58	646
082	3/30/2022	16:09:58	648
083	3/30/2022	16:10:58	652
084	3/30/2022	16:11:58	647
085	3/30/2022	16:12:58	642
086	3/30/2022	16:13:58	639
087	3/30/2022	16:14:58	645
088	3/30/2022	16:15:58	644
089	3/30/2022	16:16:58	640
090	3/30/2022	16:17:58	639
091	3/30/2022	16:18:58	645
092	3/30/2022	16:19:58	636
093	3/30/2022	16:20:58	645
094	3/30/2022	16:21:58	636
095	3/30/2022	16:22:58	634
096	3/30/2022	16:23:58	631
097	3/30/2022	16:24:58	632
098	3/30/2022	16:25:58	639
099	3/30/2022	16:26:58	638
100	3/30/2022	16:27:58	641
101	3/30/2022	16:28:58	641
102	3/30/2022	16:29:58	631
103	3/30/2022	16:30:58	630
104	3/30/2022	16:31:58	626
105	3/30/2022	16:32:58	625
106	3/30/2022	16:33:58	626
107	3/30/2022	16:34:58	625
108	3/30/2022	16:35:58	621
109	3/30/2022	16:36:58	624
110	3/30/2022	16:37:58	622
111	3/30/2022	16:38:58	627
112	3/30/2022	16:39:58	622
113	3/30/2022	16:40:58	634
114	3/30/2022	16:41:58	629
115	3/30/2022	16:42:58	629
116	3/30/2022	16:43:58	635
117	3/30/2022	16:44:58	626

118	3/30/2022 16:45:58	623
119	3/30/2022 16:46:58	633
120	3/30/2022 16:47:58	636
121	3/30/2022 16:48:58	632
122	3/30/2022 16:49:58	617
123	3/30/2022 16:50:58	628
124	3/30/2022 16:51:58	614
125	3/30/2022 16:52:58	614
126	3/30/2022 16:53:58	613
127	3/30/2022 16:54:58	620
128	3/30/2022 16:55:58	615
129	3/30/2022 16:56:58	615
130	3/30/2022 16:57:58	601
131	3/30/2022 16:58:58	594
132	3/30/2022 16:59:58	601
133	3/30/2022 17:00:58	616
134	3/30/2022 17:01:58	606
135	3/30/2022 17:02:58	610
136	3/30/2022 17:03:58	606
137	3/30/2022 17:04:58	609
138	3/30/2022 17:05:58	605
139	3/30/2022 17:06:58	595
140	3/30/2022 17:07:58	593
141	3/30/2022 17:08:58	586
142	3/30/2022 17:09:58	597
Peak	690	
Min	586	
Average	647	

==========
22/03/30 17:20
****
Summary

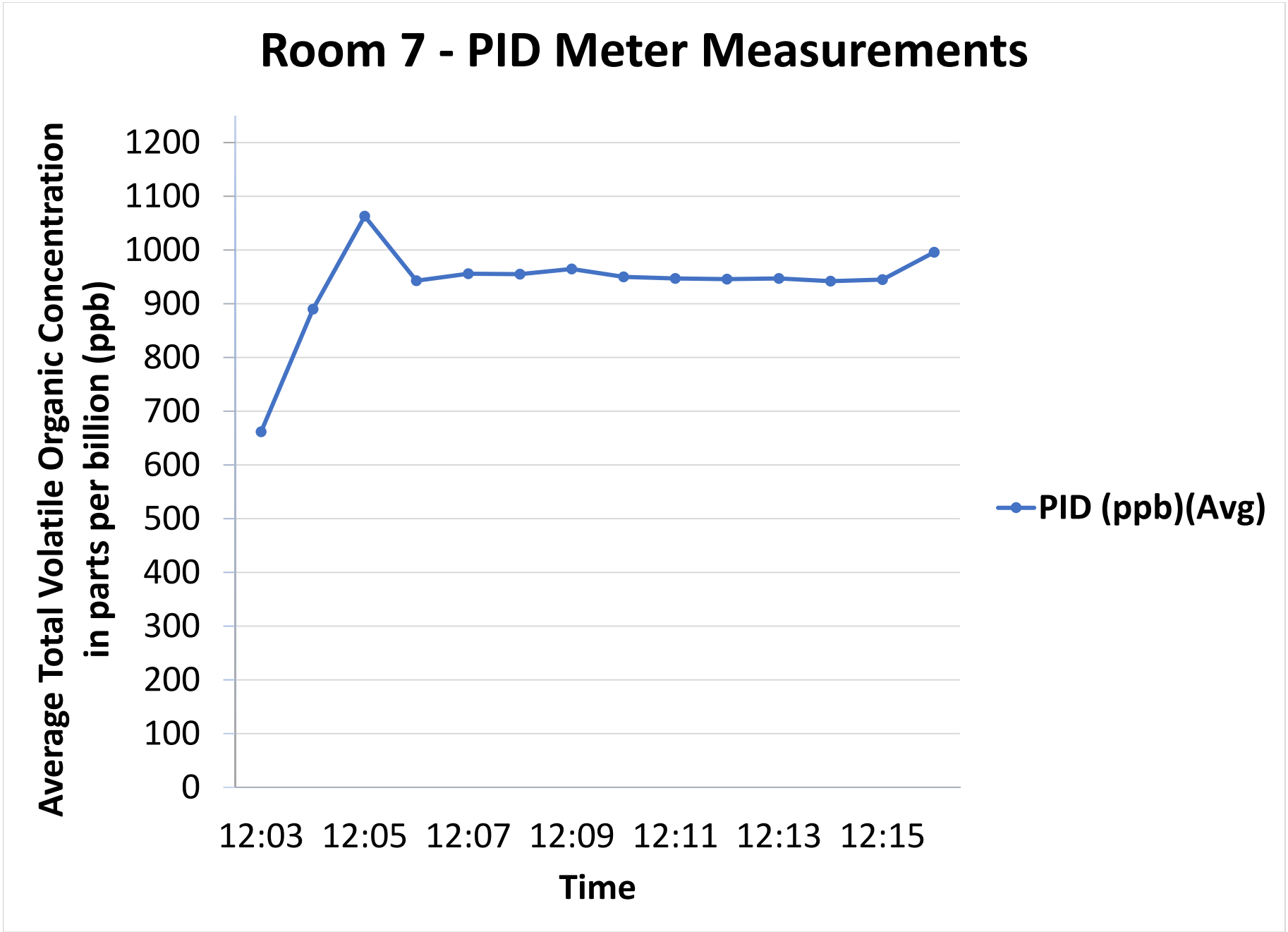
Unit Name ppbRAE 3000(PGM-7340)
Unit SN 594-906685
Unit Firmware Ver V2.22A

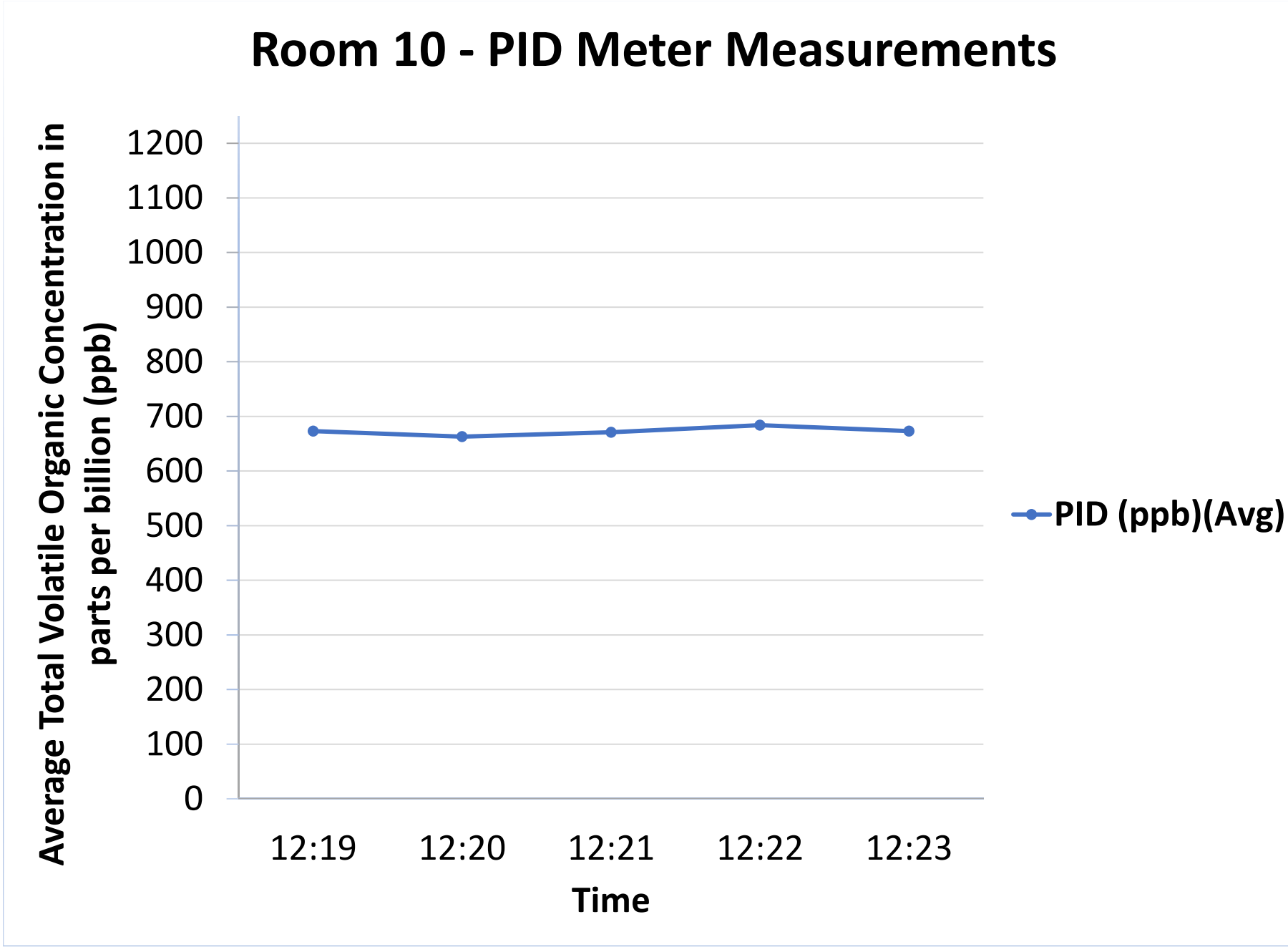
Running Mode Hygiene Mode
Datalog Mode Auto
Diagnostic Mode No
Stop Reason Power Down

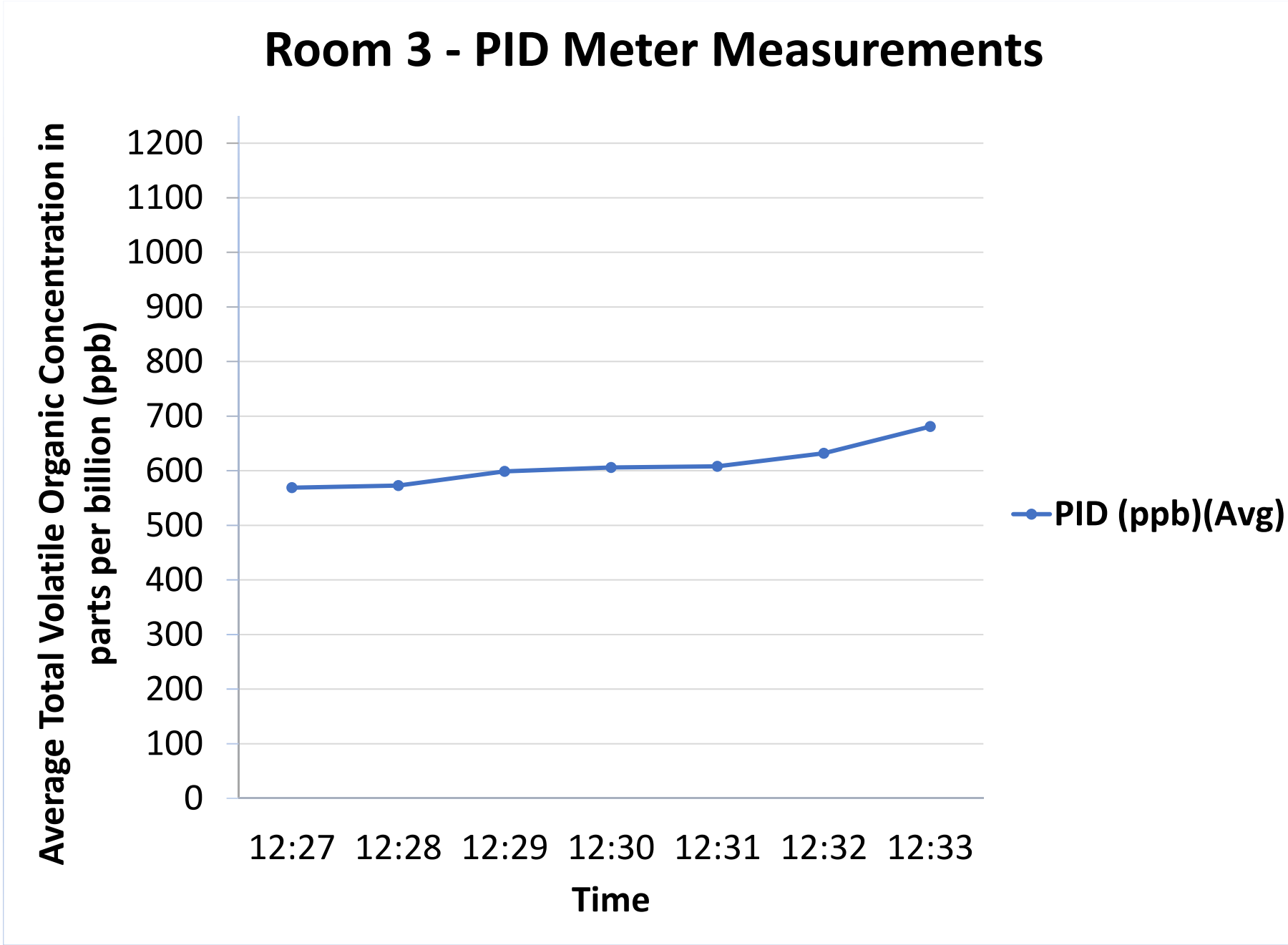
Site ID RAE00000
User ID USER0000

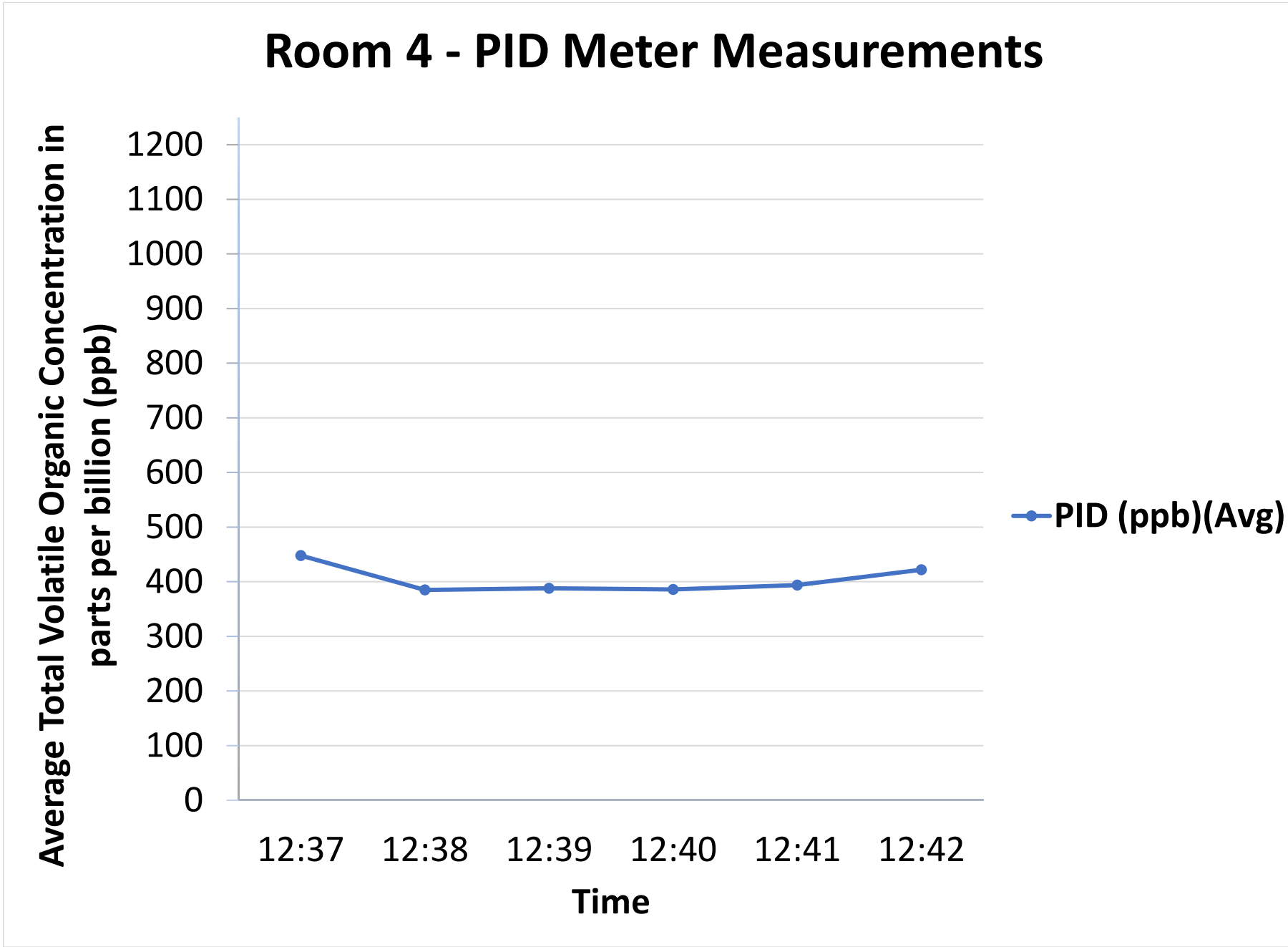
Begin 3/30/2022 17:20:35
End 3/30/2022 17:20:47
Sample Period(s) 60
Number of Records 0

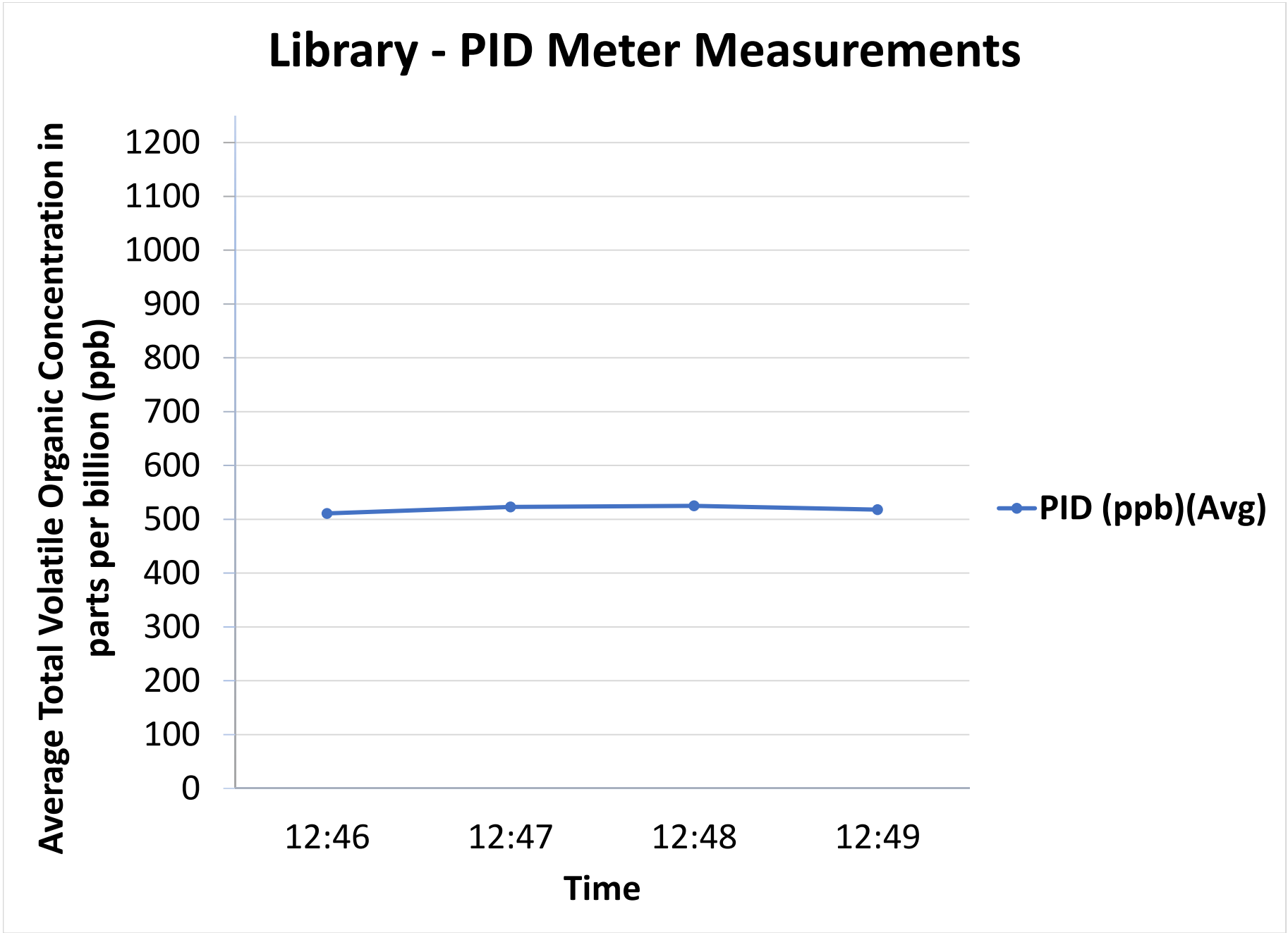
```
------------------------------------------------------------
Sensor  PID(ppb)
Sensor SN       S023030311W6
Measure Type    Avg
Span    10000
Span 2  1000000
Low Alarm       50000
High Alarm      100000
Over Alarm      10000000
STEL Alarm      100000
TWA Alarm       50000
Measurement Gas Isobutylene
Calibration Time        3/29/2022 16:06

************************************************************
Datalog

0 record.
```

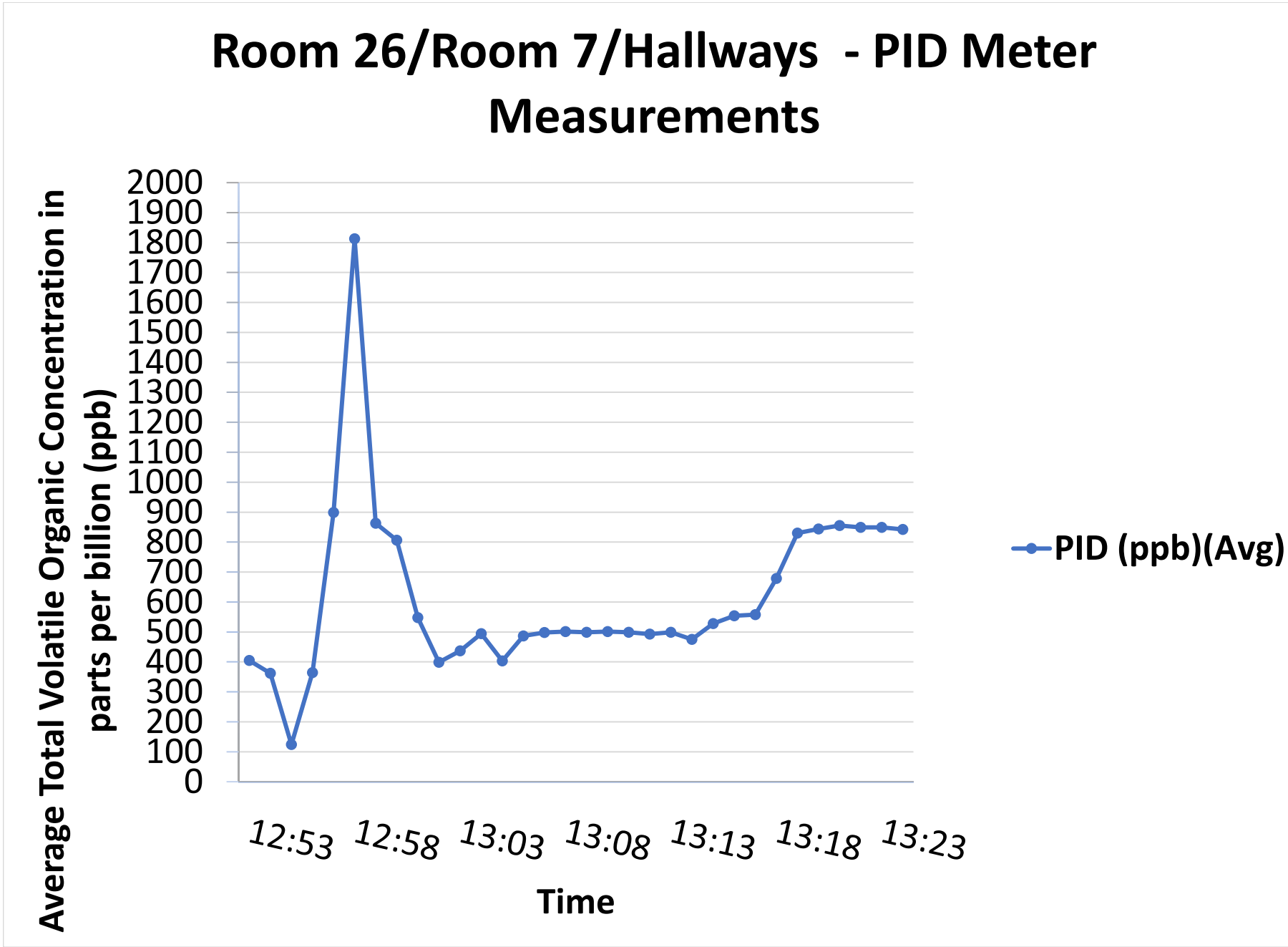

Room 7 - PID Meter Measurements
Average Total Volatile Organic Concentration in parts per billion (ppb)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
12:03
12:05
12:07
12:09
12:11
12:13
12:15
Time
PID (ppb)(Avg)

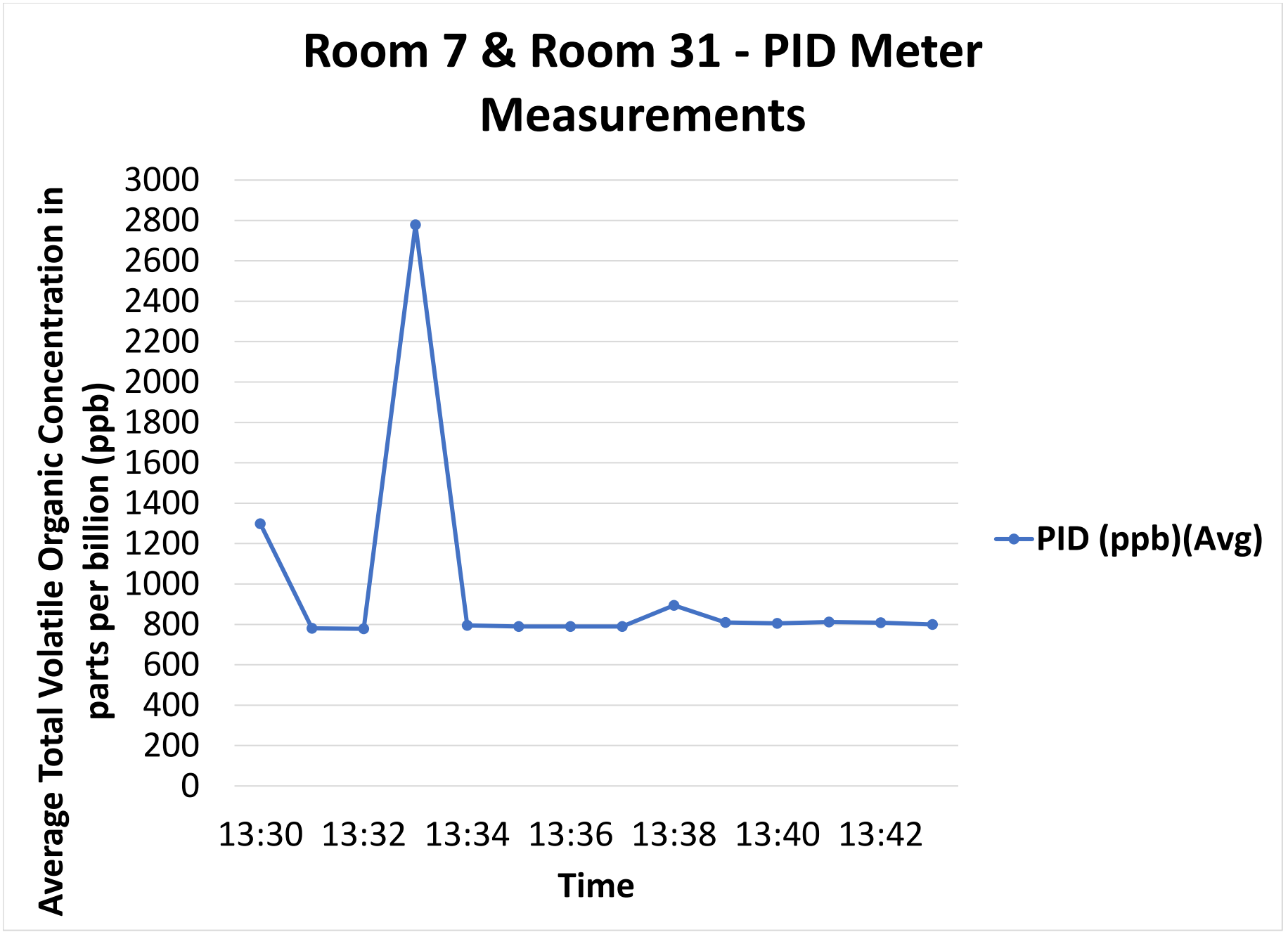

Room 10 - PID Meter Measurements
Average Total Volatile Organic Concentration in parts per billion (ppb)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
12:19
12:20
12:21
12:22
12:23
Time
PID (ppb)(Avg)

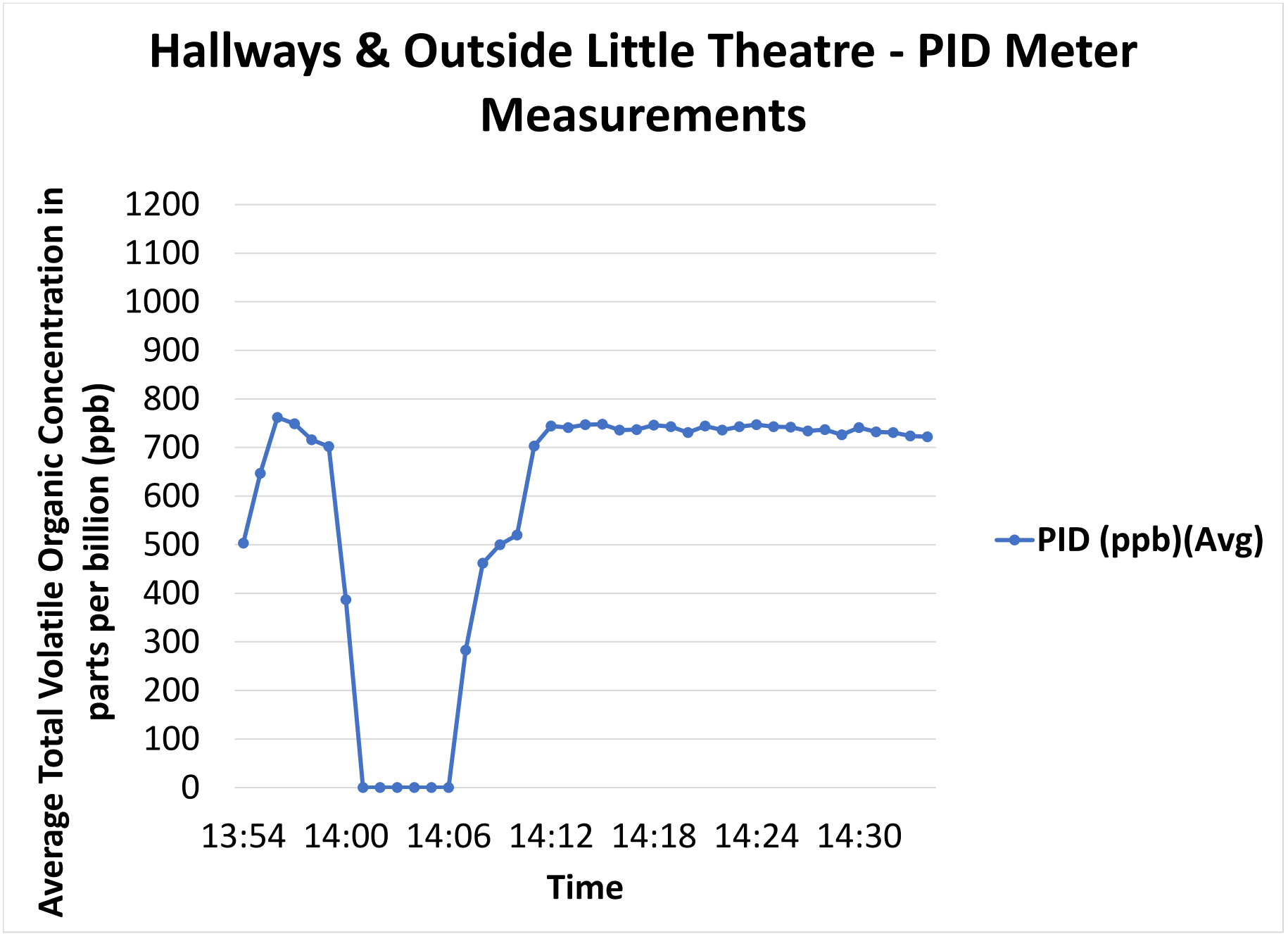

Room 3 - PID Meter Measurements
Average Total Volatile Organic Concentration in parts per billion (ppb)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
12:27
12:28
12:29
12:30
12:31
12:32
12:33
Time
PID (ppb)(Avg)

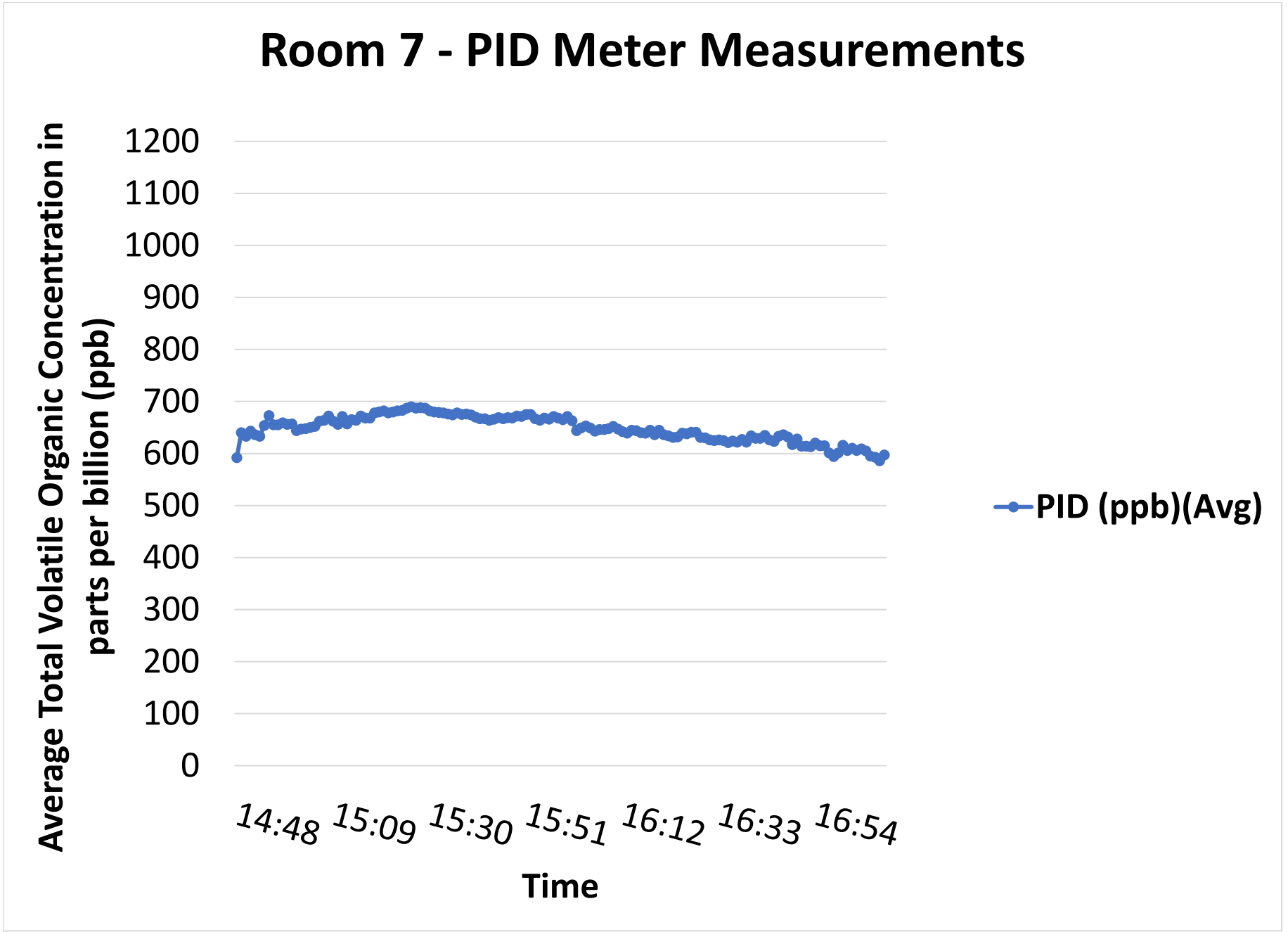

Room 4 - PID Meter Measurements
Average Total Volatile Organic Concentration in parts per billion (ppb)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
12:37
12:38
12:39
12:40
12:41
12:42
Time
PID (ppb)(Avg)


Library - PID Meter Measurements
Average Total Volatile Organic Concentration in parts per billion (ppb)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
12:46
12:47
12:48
12:49
Time
PID (ppb)(Avg)


Room 26/Room 7/Hallways - PID Meter Measurements
Average Total Volatile Organic Concentration in parts per billion (ppb)
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
12:53
12:58
13:03
13:08
13:13
13:18
13:23
Time
PID (ppb)(Avg)


Room 7 & Room 31 - PID Meter Measurements
Average Total Volatile Organic Concentration in parts per billion (ppb)
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
13:30
13:32
13:34
13:36
13:38
13:40
13:42
Time
PID (ppb)(Avg)


Hallways & Outside Little Theatre - PID Meter Measurements
Average Total Volatile Organic Concentration in parts per billion (ppb)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
13:54
14:00
14:06
14:12
14:18
14:24
14:30
Time
PID (ppb)(Avg)


Room 7 - PID Meter Measurements
Average Total Volatile Organic Concentration in parts per billion (ppb)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
14:48
15:09
15:30
15:51
16:12
16:33
16:54
Time
PID (ppb)(Avg)

APPENDIX C

COMPREHENSIVE AIR SURVEY SAMPLES LOCATION DIAGRAM

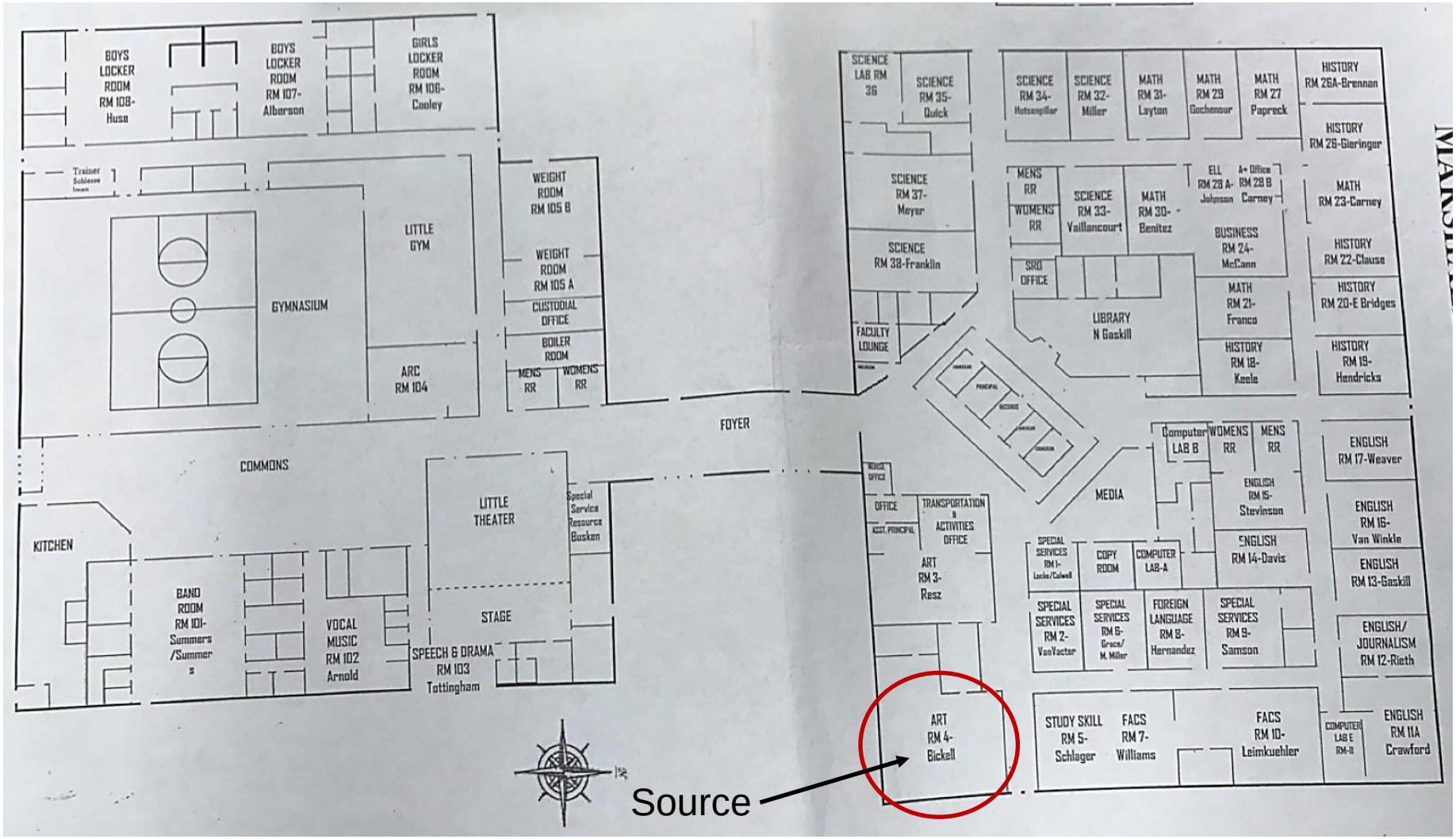
Comprehensive Air Survey Sample Location Diagram
Appendix C

Legend

● # Air Sample Location

Comprehensive Air Survey Sample Location Diagram Gallagher Bassett Services **Marshall Public High School** 805 South Miami Avenue Marshall, Missouri	**DATE ASSESSED:** March 30, 2022 **DESIGNED:** J. Harvey **PROJECT NO.** 21111804	JS HELD

Marshall High School - Overview



Comprehensive Air Survey Sample Location Diagram
Gallagher Bassett Services
Marshall Public High School
805 South Miami Avenue
Marshall, Missouri

DATE ASSESSED: March 30, 2022

DESIGNED: J. Harvey

PROJECT NO. 21111804

JS|HELD

Marshall High School

Air Samples Location Descriptions:

1: Room 7.
2: Room 10.
3: Room 3.
4: Room 4.
5: Library.
6: Room 26.
7: Southeast hall between rooms 36 and 37.
8: Room 31.
9: Room 14.
10: Hall outside of little theatre.

Comprehensive Air Survey Sample Location Diagram
Gallagher Bassett Services
Marshall Public High School
805 South Miami Avenue
Marshall, Missouri

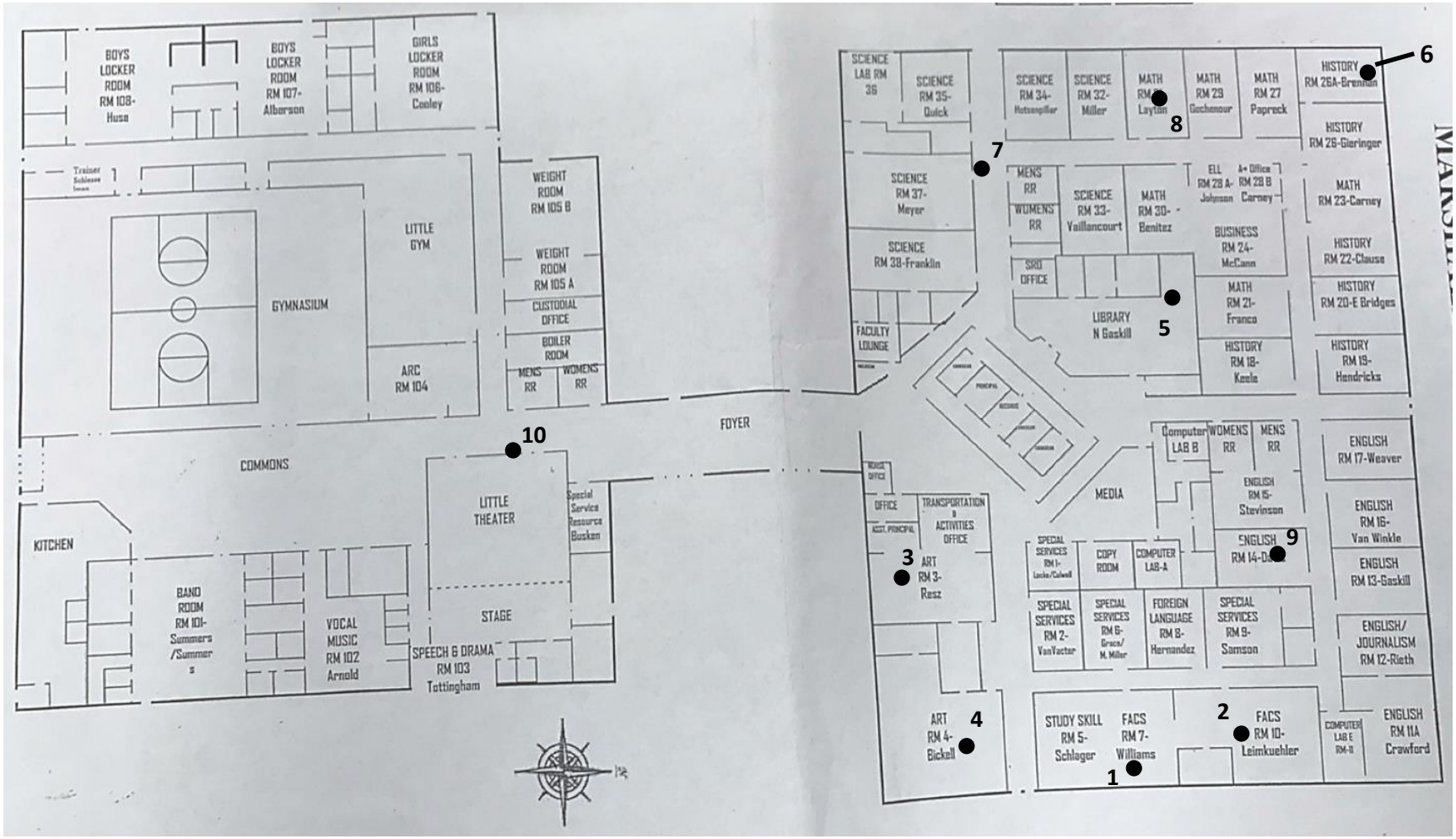
DATE ASSESSED: March 30, 2022

DESIGNED: J. Harvey

PROJECT NO. 21111804

JS|HELD

Marshall High School



Comprehensive Air Survey Sample Location Diagram
Gallagher Bassett Services
Marshall Public High School
805 South Miami Avenue
Marshall, Missouri

DATE ASSESSED: March 30, 2022

DESIGNED: J. Harvey

PROJECT NO. 21111804

JS|HELD

APPENDIX D

COMBUSTION BYPRODUCT SAMPLES LOCATION DIAGRAM

Combustion Byproduct Sample Location Diagram
Appendix D

Legend

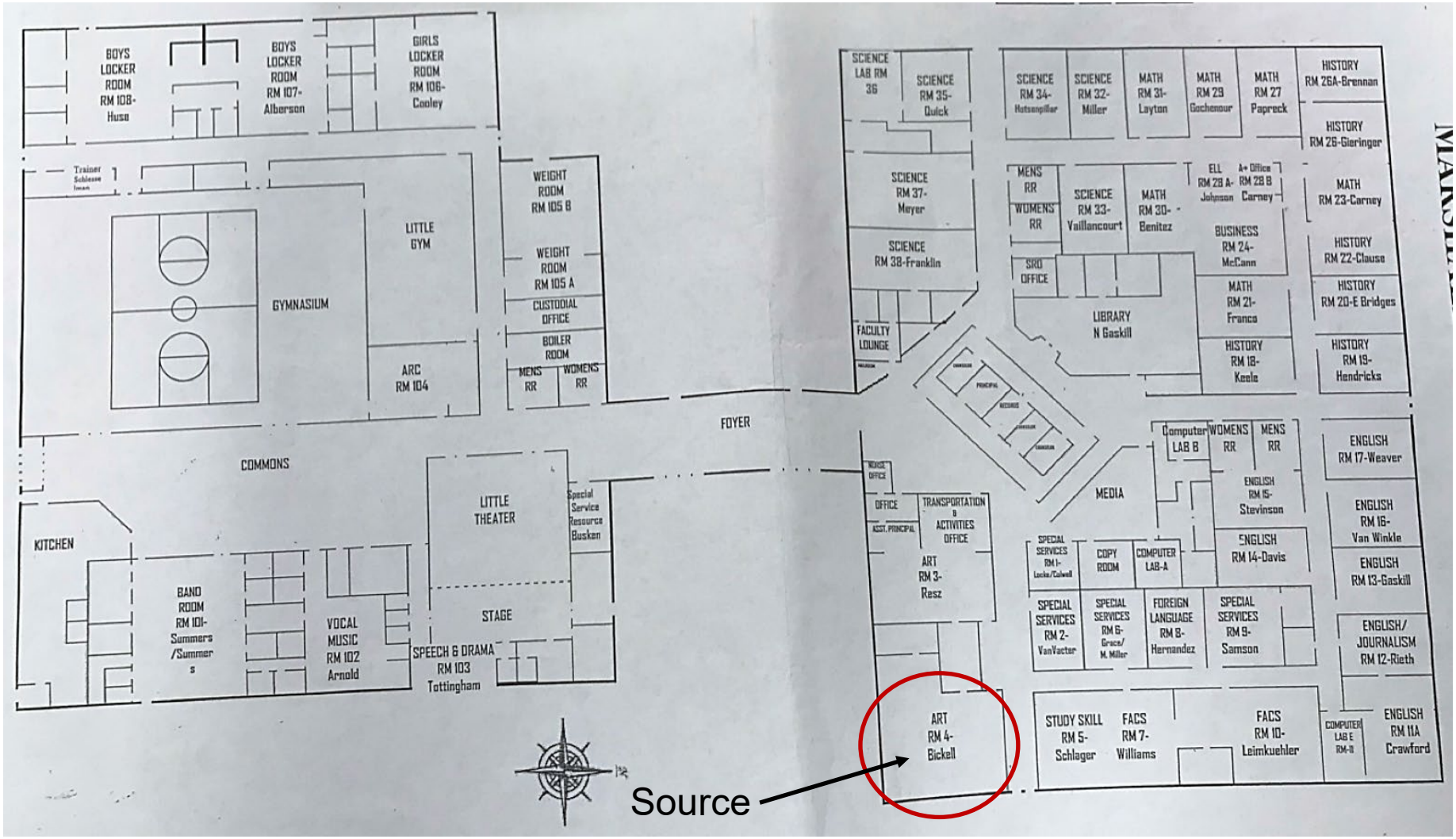
T-# / A-#	Tape Lift / Air Sample – Elevated Range
T-# / A-#	Tape Lift / Air Sample – Atypical Range
T-# / A-#	Tape Lift / Air Sample – Typical – Upper Background Range
T-# / A-#	Tape Lift / Air Sample – Typical – Low Range
T-# / A-#	Tape Lift / Air Sample – None Detected

Combustion Byproduct Sample Location Diagram
Gallagher Bassett Services
Marshall Public High School
805 South Miami Avenue
Marshall, Missouri

DATE ASSESSED: March 30, 2022
DESIGNED: J. Harvey
PROJECT NO. 21111804

JS|HELD

Marshall High School - Overview



Combustion Byproduct Sample Location Diagram
Gallagher Bassett Services
Marshall Public High School
805 South Miami Avenue
Marshall, Missouri

DATE ASSESSED: March 30, 2022

DESIGNED: J. Harvey

PROJECT NO. 21111804

JS|HELD

Marshall High School

Air Samples Location Descriptions:

A-1: Room 7.
A-2: Room 10.
A-3: Room 3.
A-4: Room 4.
A-5: Library.
A-6: Room 26.
A-7: Southeast hall between rooms 36 and 37.
A-8: Room 31.
A-9: Room 14.
A-10: Hall outside of little theatre.

Surface/Tape Lift Samples Location Descriptions:

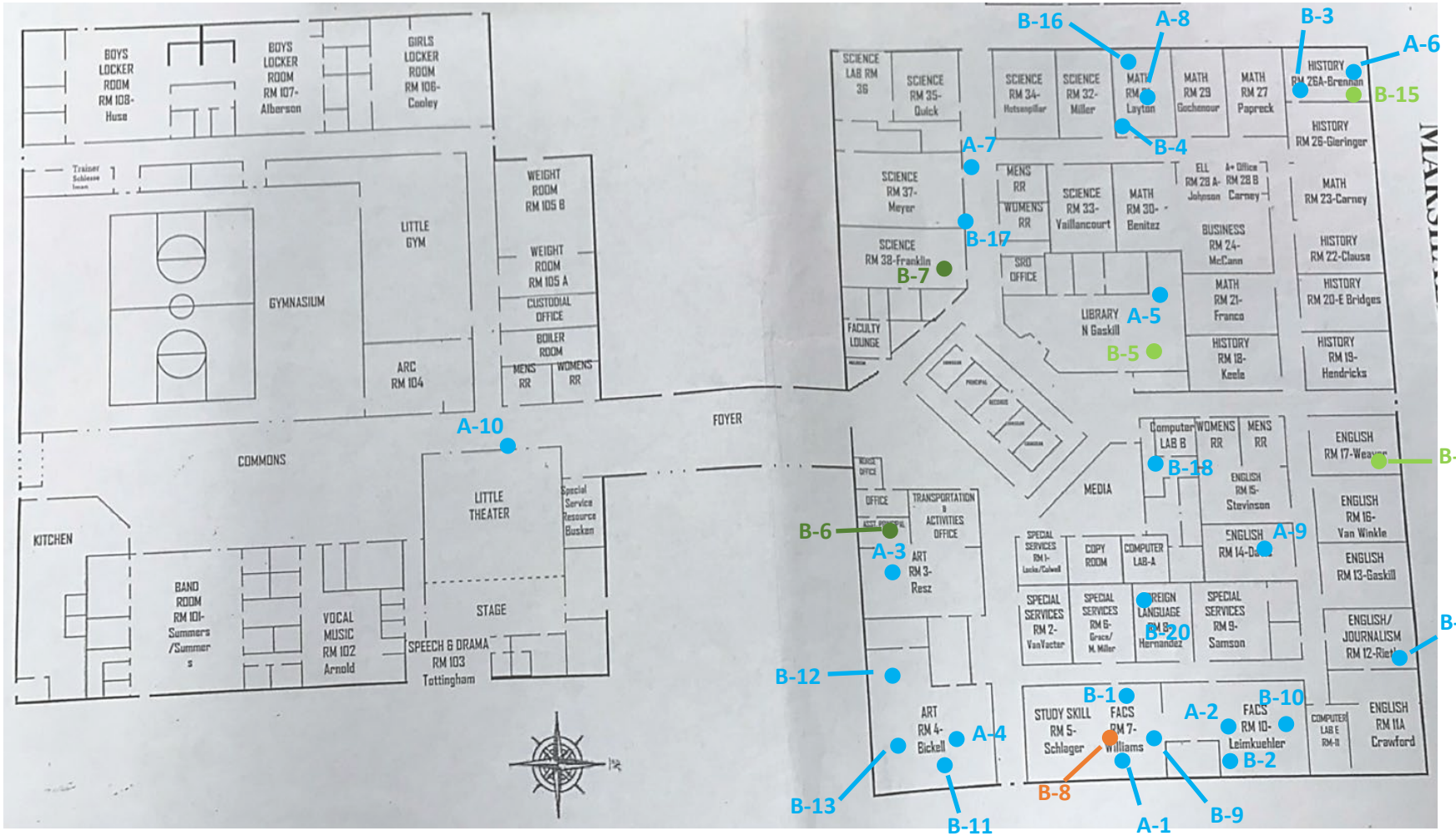
B-1: Room 7 – Carpet.
B-2: Room 10 – Carpet.
B-3: Room 26 – Carpet.
B-4: Room 31 – Carpet.
B-5: Library – Carpet.
B-6: Assistant Principal's Office – Carpet
B-7: Room 28 – Carpet.
B-8: Room 7 – Contents in ServPro box.
B-9: Room 7 – Contents in ServPro box.
B-10: Room 10 – Contents in ServPro box.
B-11: Room 4 – Contents in ServPro box.
B-12: Room 4 – Contents in ServPro box.
B-13: Room 4 – Contents in ServPro box.
B-14: Room 17 – Contents in ServPro box.
B-15: Room 26 – Contents in ServPro box.
B-16: Room 31 – Top of cabinet
B-17: Hallway – Contents in ServPro box.
B-18: Mrs. Simms Room – Contents in ServPro box.
B-19: Room 12 – Contents in ServPro box.
B-20: Room 8 – Top of file cabinet.

Combustion Byproduct Sample Location Diagram
Gallagher Bassett Services
Marshall Public High School
805 South Miami Avenue
Marshall, Missouri

DATE ASSESSED:	March 30, 2022
DESIGNED:	J. Harvey
PROJECT NO.	21111804

JS|HELD

Marshall High School



Combustion Byproduct Sample Location Diagram
Gallagher Bassett Services
Marshall Public High School
805 South Miami Avenue
Marshall, Missouri

DATE ASSESSED:	March 30, 2022
DESIGNED:	J. Harvey
PROJECT NO.	21111804

JS|HELD

APPENDIX E

MOLD SURFACE SAMPLE LOCATION DIAGRAMS

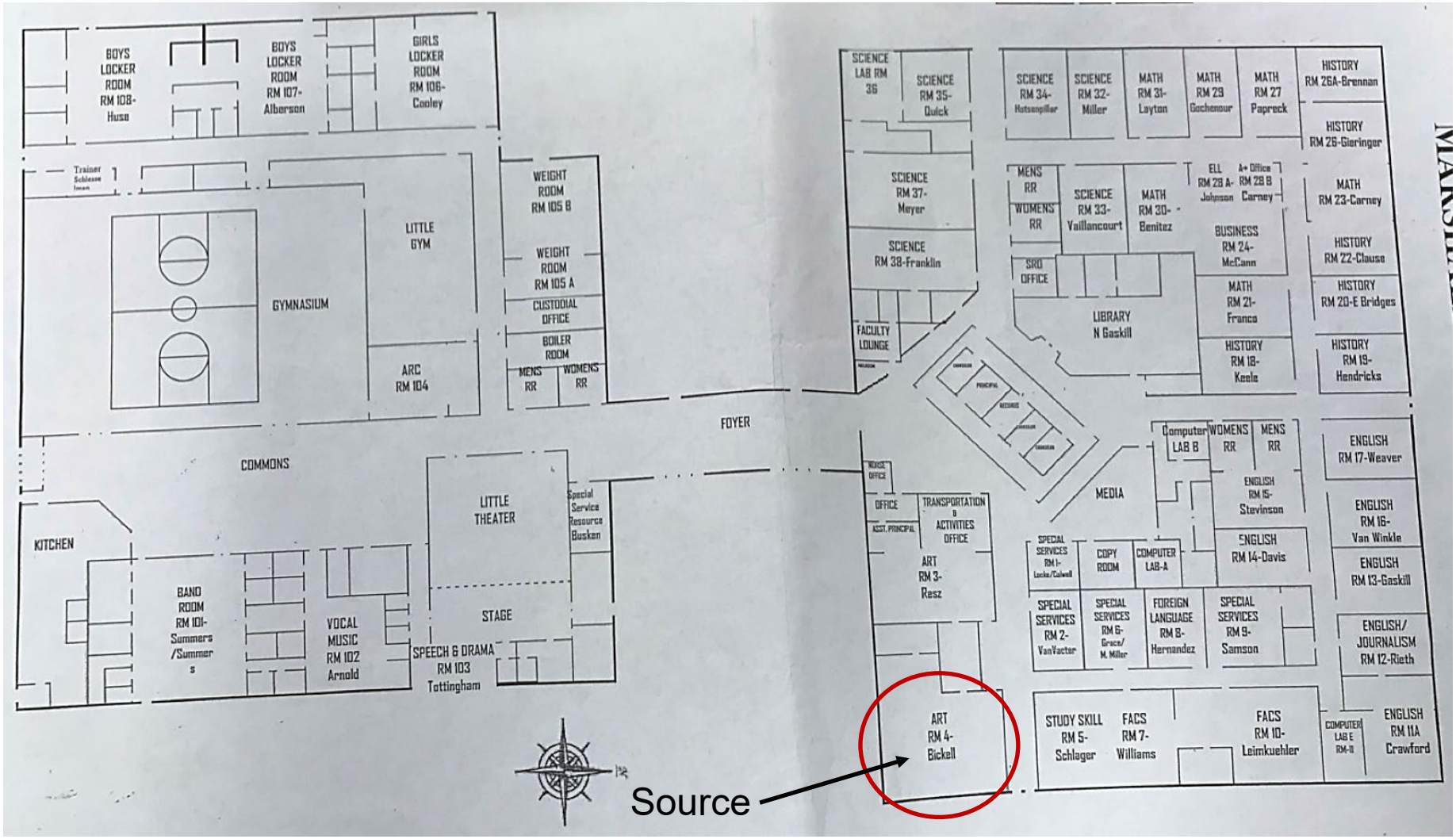
Mold Surface Sample Location Diagram
Appendix E

Legend

C-# Mold Surface Sample

Mold Surface Sample Location Diagram Gallagher Bassett Services **Marshall Public High School** 805 South Miami Avenue Marshall, Missouri	**DATE ASSESSED:** March 30, 2022 **DESIGNED:** J. Harvey **PROJECT NO.** 21111804	JS|HELD

Marshall High School - Overview



Mold Surface Sample Location Diagram
Gallagher Bassett Services
Marshall Public High School
805 South Miami Avenue
Marshall, Missouri

DATE ASSESSED: March 30, 2022

DESIGNED: J. Harvey

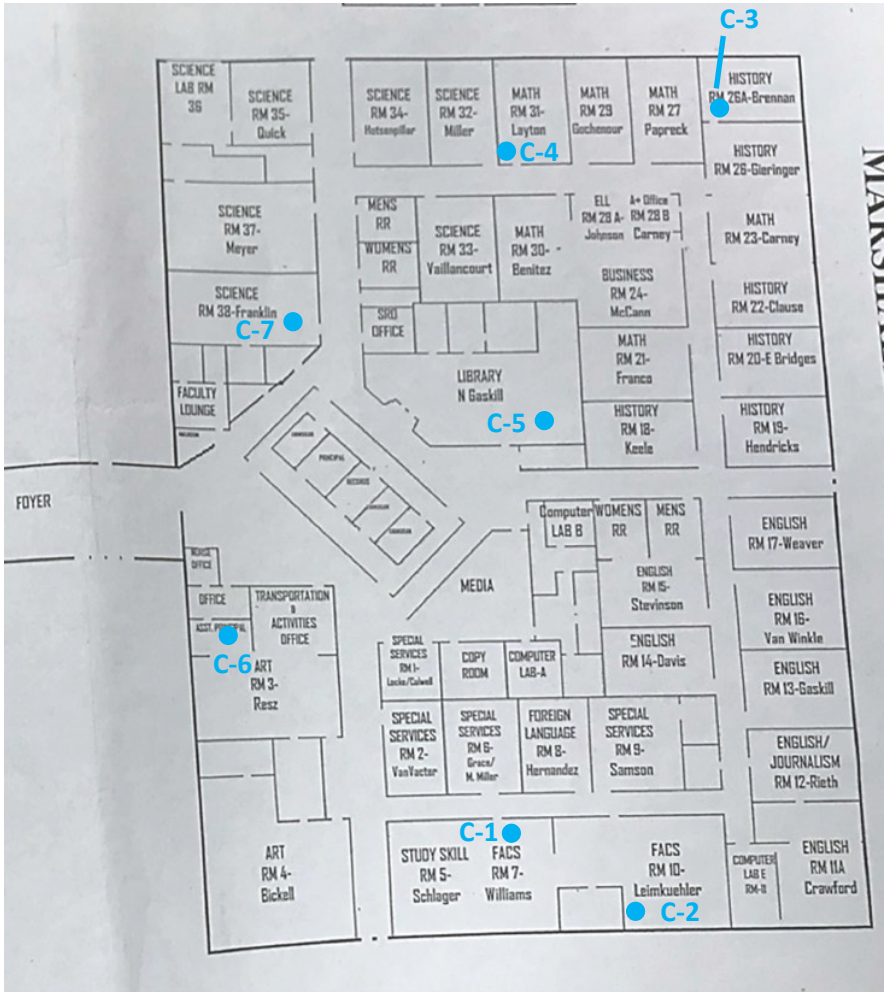
PROJECT NO. 21111804

JS|HELD

Marshall High School

Surface/Tape Lift Samples Location Descriptions:

C-1: Room 7 – Carpet.
C-2: Room 10 – Carpet.
C-3: Room 26 – Carpet.
C-4: Room 31 – Carpet.
C-5: Library – Carpet.
C-6: Assistant Principal's Office – Carpet
C-7: Room 28 – Carpet.



Mold Surface Sample Location Diagram Gallagher Bassett Services **Marshall Public High School** 805 South Miami Avenue Marshall, Missouri	**DATE ASSESSED:** March 30, 2022 **DESIGNED:** J. Harvey **PROJECT NO.** 21111804	JS|HELD

APPENDIX F

ENTHALPY COMPREHENSIVE AIR SURVEY LABORATORY ANALYTICAL REPORT

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Ste 117 Jericho, NY 11753 US	**COC:** **Laboratory ID:**	**99670** **99670-1**
Sampled By:	James Harvey		
Project:	Marshall H.S.21111804		
Location:	805 S. Miami Ave. Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	03/31/2022 03/31/2022 03/31/2022 04/05/2022
Client Sample ID:	Rm 7		
Volume:	24 L		
Date Sampled:	03/30/2022		
Sample Type:	TDT WW498		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. Sample Summary: listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	5900	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	5	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	420	69	4	912	DPGME
Texanol-B	74367-34-3	250	28	4	1127	
Texanol-A	74367-33-2	200	23	4	1122	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	1500	770	2.1	480	J*
Isopropanol	67-63-0	150	62	1.0	517	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**61**	**25**	1.0	509	
Acetonitrile	75-05-8	**0.5**	**0.3**	0.4	522	
Acrylonitrile	107-13-1	< 0.2	< 0.09	0.2	543	
Benzene	71-43-2	**0.4**	**0.1**	0.2	631	
Bromobenzene	108-86-1	< 0.2	< 0.03	0.2	866	
Bromochloromethane	74-97-5	< 0.2	< 0.04	0.2	603	
Bromodichloromethane	75-27-4	< 0.2	< 0.03	0.2	682	
Bromoform	75-25-2	< 0.2	< 0.02	0.2	837	
1,3-Butadiene	106-99-0	< 0.2	< 0.09	0.2	389	
tert-Butylbenzene	98-06-6	< 0.2	< 0.04	0.2	900	
sec-Butylbenzene	135-98-8	< 0.2	< 0.04	0.2	914	
n-Butylbenzene	104-51-8	< 0.2	< 0.04	0.2	949	
Carbon Disulfide	75-15-0	< 0.2	< 0.07	0.2	520	
Carbon Tetrachloride	56-23-5	**0.7**	**0.1**	0.2	623	
Chlorobenzene	108-90-7	< 0.2	< 0.04	0.2	791	
Chlorodibromomethane	124-48-1	< 0.2	< 0.02	0.2	759	
2-Chloroethanol	107-07-3	< 0.2	< 0.06	0.2	675	
Chloroform	67-66-3	**0.3**	**0.05**	0.2	608	
Chloroprene	126-99-8	< 0.2	< 0.06	0.2	571	
3-Chloropropene	107-05-1	< 0.2	< 0.07	0.2	527	
4-Chlorotoluene	106-43-4	< 0.2	< 0.04	0.2	883	
2-Chlorotoluene	95-49-8	< 0.2	< 0.04	0.2	877	
Cyclohexane	110-82-7	**0.3**	**0.08**	0.2	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.4	< 0.04	0.4	991	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.2	< 0.03	0.2	766	
Dibromomethane	74-95-3	< 0.2	< 0.03	0.2	674	
trans 1,4-Dichloro-2-butene	110-57-6	< 0.2	< 0.04	0.2	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.2	< 0.04	0.2	848	
1,2-Dichlorobenzene	95-50-1	< 0.2	< 0.03	0.2	951	
1,3-Dichlorobenzene	541-73-1	< 0.2	< 0.03	0.2	923	
1,4-Dichlorobenzene	106-46-7	**2.9**	**0.5**	0.2	930	
1,1-Dichloroethane	75-34-3	< 0.2	< 0.05	0.2	567	
1,2-Dichloroethane	107-06-2	< 0.2	< 0.05	0.2	633	
cis 1,2-Dichloroethene	156-59-2	< 0.2	< 0.05	0.2	593	
trans 1,2-Dichloroethene	156-60-5	< 0.2	< 0.05	0.2	548	
1,1-Dichloroethene	75-35-4	< 0.2	< 0.05	0.2	508	
2,2-Dichloropropane	594-20-7	< 0.2	< 0.04	0.2	593	
1,2-Dichloropropane	78-87-5	< 0.2	< 0.04	0.2	670	
1,3-Dichloropropane	142-28-9	< 0.2	< 0.04	0.2	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.2	< 0.05	0.2	729	
1,1-Dichloropropene	563-58-6	< 0.2	< 0.05	0.2	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.2	< 0.05	0.2	701	
Diethyl ether	60-29-7	< 0.2	< 0.07	0.2	493	
1,4-Dioxane	123-91-1	< 0.4	< 0.1	0.4	673	
Ethanol	64-17-5	**1500**	**770**	2.1	480	J*
Ethylacetate	141-78-6	**4.6**	**1.2**	0.2	594	
Ethylbenzene	100-41-4	**0.4**	**0.09**	0.2	795	
Ethylmethacrylate	97-63-2	< 0.2	< 0.04	0.2	731	
4-Ethyltoluene	622-96-8	< 0.2	< 0.04	0.2	878	
Hexachlorobutadiene	87-68-3	< 0.2	< 0.02	0.2	1036	
Hexane (C 6)	110-54-3	**0.8**	**0.2**	0.2	562	
Isooctane	540-84-1	< 0.2	< 0.04	0.2	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**150**	**62**	1.0	517	J*
Isopropylbenzene	98-82-8	< 0.2	< 0.04	0.2	846	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.5**	**0.09**	0.2	924	
Methacrylonitrile	126-98-7	< 0.2	< 0.07	0.2	600	
Methyl methacrylate	80-62-6	< 0.2	< 0.06	0.2	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.2	< 0.06	0.2	547	MTBE
2-Methyl-1-propanol	78-83-1	< 0.2	< 0.07	0.2		Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.6**	**0.4**	0.2	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.2	< 0.06	0.2	595	
Methylene Chloride	75-09-2	**0.5**	**0.1**	0.2	533	
2-Methylnaphthalene	91-57-6	< 0.4	< 0.07	0.4	1095	
Naphthalene	91-20-3	< 0.4	< 0.08	0.4	1042	
Nitrobenzene	98-95-3	< 0.8	< 0.2	0.8	999	
Pentachloroethane	76-01-7	< 0.2	< 0.03	0.2	902	
Propionitrile	107-12-0	< 0.2	< 0.09	0.2	593	
n-Propylbenzene	103-65-1	< 0.2	< 0.04	0.2	871	
Styrene	100-42-5	**0.5**	**0.1**	0.2	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.2	< 0.03	0.2	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.2	< 0.03	0.2	794	
Tetrachloroethene	127-18-4	< 0.2	< 0.03	0.2	746	
Tetrahydrofuran	109-99-9	< 0.2	< 0.07	0.2	604	
Toluene	108-88-3	**3.4**	**0.9**	0.2	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.07**	0.2	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.2	< 0.03	0.2	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.2	< 0.03	0.2	1052	
1,1,2-Trichloroethane	79-00-5	< 0.2	< 0.04	0.2	739	
1,1,1-Trichloroethane	71-55-6	< 0.2	< 0.04	0.2	616	
Trichloroethene	79-01-6	< 0.2	< 0.04	0.2	660	
1,2,3-Trichloropropane	96-18-4	< 0.2	< 0.03	0.2	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.2	< 0.04	0.2	881	
1,2,4-Trimethylbenzene	95-63-6	< 0.2	< 0.04	0.2	903	
m,p-Xylene	108-38-3; 106-42-3	**1.1**	**0.2**	0.4	802	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.4**	**0.09**	0.2	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	7	1	4	963	
Acetaldehyde	75-07-0	60	33	4	399	
Benzaldehyde	100-52-7	7	2	4	903	
Butane (C 4)	106-97-8	10	4	4	384	
1-Butanol	71-36-3	30	10	4	654	
1-Butoxy-2-propanol	5131-66-8	4	0.8	4	864	
2-Butoxyethanol	111-76-2	22	4	4	843	
Butoxyethoxyethanol	112-34-5	45	7	4	1029	
4-tert-Butylcyclohexyl acetate	32210-23-4	5	0.6	4	1078	
C12-C14 Hydrocarbon	N/A	8	N/A	4	1051	Contains silicon and oxygen; appears to be a siloxane
C7-C9 Hydrocarbon	N/A	10	N/A	4	755	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS); one is hexanal (CAS)
Diethylene glycol ethyl ether	111-90-0	29	5	4	922	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	420	69	4	912	DPGME
Dodecane (C 12)	112-40-3	8	1	4	1008	
2-Ethyl-1-hexanol	104-76-7	18	3	4	936	
Ethylene Glycol	107-21-1	57	22	4	715	
Isobutane	75-28-5	10	4	4	359	
Isohexadecane	4390-04-9	7	0.8	4	1077	
Isoprene	78-79-5	7	3	4	497	
Limonene	138-86-3 or 5989-27-5	50	9	4	923	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
Methoxy-2-propanol	107-98-2	7	2	4	654	PGME

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
2-Methylbutane	78-78-4	6	2	4	447	
Nonanal	124-19-6	5	0.9	4	983	
Octamethylcyclotetrasiloxane (D4)	556-67-2	5	0.4	4	859	
Pentane (C 5)	109-66-0	23	8	4	475	
1-Propanol	71-23-8	7	3	4	569	
n-Propylacetate	109-60-4	7	2	4	674	
Propylene glycol	57-55-6	14	4	4	747	
Tetradecane (C 14)	629-59-4	6	0.7	4	1097	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	34	4	4	1135	
Texanol-A	74367-33-2	200	23	4	1122	
Texanol-B	74367-34-3	250	28	4	1127	
Tridecane (C 13)	629-50-5	6	0.8	4	1054	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

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Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	60	33	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetone	67-64-1	61	25	400 - 11,745,000	sweet, fruity, etherous
Acetonitrile	75-05-8	0.5	0.3	13,000 - 1,161,000	etherish
Benzaldehyde	100-52-7	7	2	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.4	0.1	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	10	4	421 - 5,048,000	natural gas
1-Butanol	71-36-3	30	10	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	22	4	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.7	0.1	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
Chloroform	67-66-3	0.3	0.05	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.3	0.08	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	2.9	0.5	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	29	5	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	1500	770	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	18	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	4.6	1.2	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.4	0.09	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	57	22	5,120 -	-
Hexane (C 6)	110-54-3	0.8	0.2	1,500 - 248,000	gasoline
Isoprene	78-79-5	7	3	47 - 3,590	aromatic
Isopropanol	67-63-0	150	62	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	50	9	2 - 310	lemon, plastic, citrus, rubber, terpeny
Methoxy-2-propanol	107-98-2	7	2	8,390 - 33,000	etherish, ammonia
4-Methyl-2-pentanone	108-10-1	1.6	0.4	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet

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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Methylene Chloride	75-09-2	0.5	0.1	1,200 - 440,000	sweet
Pentane (C 5)	109-66-0	23	8	1,290 - 1,147,000	sweet
1-Propanol	71-23-8	7	3	31 - 10,172,000	sweet, alcohol
n-Propylacetate	109-60-4	7	2	48 - 87,000	sweet, ester
Propylene glycol	57-55-6	14	4	5,140 -	-
Styrene	100-42-5	0.5	0.1	3 - 61,000	sharp, sweet
Toluene	108-88-3	3.4	0.9	21 - 157,000	sour, burnt
m,p-Xylene	108-38-3; 106-42-3	1.1	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.4	0.09	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.4	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.7	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.3	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	2.9	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.4	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.5	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Styrene	100-42-5	0.5	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Toluene	108-88-3	3.4	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	1.1	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.4	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of th uality indicators. It allows comparison of multiple samples with each other or with target l The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{[\frac{(A_s - A_b) \times W_s}{A_i}]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily to ppb using the following formula derived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as th $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, can be determined using the following formula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x

RTn – retention time of n-alkane eluting before target compound x
RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Ste 117 Jericho, NY 11753 US	**COC:** **Laboratory ID:**	**99670** **99670-2**
Sampled By:	James Harvey		
Project:	Marshall H.S.21111804		
Location:	805 S. Miami Ave. Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	03/31/2022 03/31/2022 03/31/2022 04/05/2022
Client Sample ID:	Rm 10		
Volume:	24 L		
Date Sampled:	03/30/2022		
Sample Type:	TDT YY025		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. Sample Summary: listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	6000	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	5	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	450	73	4	912	DPGME
Texanol-B	74367-34-3	300	34	4	1127	
Texanol-A	74367-33-2	240	26	4	1122	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	1400	720	2.1	480	J*
Isopropanol	67-63-0	120	47	1.0	517	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**62**	**26**	1.0	509	
Acetonitrile	75-05-8	**0.6**	**0.4**	0.4	522	
Acrylonitrile	107-13-1	< 0.2	< 0.09	0.2	543	
Benzene	71-43-2	**0.4**	**0.1**	0.2	631	
Bromobenzene	108-86-1	< 0.2	< 0.03	0.2	866	
Bromochloromethane	74-97-5	< 0.2	< 0.04	0.2	603	
Bromodichloromethane	75-27-4	< 0.2	< 0.03	0.2	682	
Bromoform	75-25-2	< 0.2	< 0.02	0.2	837	
1,3-Butadiene	106-99-0	< 0.2	< 0.09	0.2	389	
tert-Butylbenzene	98-06-6	< 0.2	< 0.04	0.2	900	
sec-Butylbenzene	135-98-8	< 0.2	< 0.04	0.2	914	
n-Butylbenzene	104-51-8	< 0.2	< 0.04	0.2	949	
Carbon Disulfide	75-15-0	< 0.2	< 0.07	0.2	520	
Carbon Tetrachloride	56-23-5	**0.7**	**0.1**	0.2	623	
Chlorobenzene	108-90-7	< 0.2	< 0.04	0.2	791	
Chlorodibromomethane	124-48-1	< 0.2	< 0.02	0.2	759	
2-Chloroethanol	107-07-3	< 0.2	< 0.06	0.2	675	
Chloroform	67-66-3	**0.3**	**0.05**	0.2	608	
Chloroprene	126-99-8	< 0.2	< 0.06	0.2	571	
3-Chloropropene	107-05-1	< 0.2	< 0.07	0.2	527	
4-Chlorotoluene	106-43-4	< 0.2	< 0.04	0.2	883	
2-Chlorotoluene	95-49-8	< 0.2	< 0.04	0.2	877	
Cyclohexane	110-82-7	**0.3**	**0.08**	0.2	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.4	< 0.04	0.4	991	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.2	< 0.03	0.2	766	
Dibromomethane	74-95-3	< 0.2	< 0.03	0.2	674	
trans 1,4-Dichloro-2-butene	110-57-6	< 0.2	< 0.04	0.2	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.2	< 0.04	0.2	848	
1,2-Dichlorobenzene	95-50-1	< 0.2	< 0.03	0.2	951	
1,3-Dichlorobenzene	541-73-1	< 0.2	< 0.03	0.2	923	
1,4-Dichlorobenzene	106-46-7	**3.1**	**0.5**	0.2	930	
1,1-Dichloroethane	75-34-3	< 0.2	< 0.05	0.2	567	
1,2-Dichloroethane	107-06-2	< 0.2	< 0.05	0.2	633	
cis 1,2-Dichloroethene	156-59-2	< 0.2	< 0.05	0.2	593	
trans 1,2-Dichloroethene	156-60-5	< 0.2	< 0.05	0.2	548	
1,1-Dichloroethene	75-35-4	< 0.2	< 0.05	0.2	508	
2,2-Dichloropropane	594-20-7	< 0.2	< 0.04	0.2	593	
1,2-Dichloropropane	78-87-5	< 0.2	< 0.04	0.2	670	
1,3-Dichloropropane	142-28-9	< 0.2	< 0.04	0.2	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.2	< 0.05	0.2	729	
1,1-Dichloropropene	563-58-6	< 0.2	< 0.05	0.2	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.2	< 0.05	0.2	701	
Diethyl ether	60-29-7	< 0.2	< 0.07	0.2	493	
1,4-Dioxane	123-91-1	< 0.4	< 0.1	0.4	673	
Ethanol	64-17-5	**1400**	**720**	2.1	480	J*
Ethylacetate	141-78-6	**3.4**	**0.9**	0.2	594	
Ethylbenzene	100-41-4	**0.4**	**0.09**	0.2	795	
Ethylmethacrylate	97-63-2	< 0.2	< 0.04	0.2	731	
4-Ethyltoluene	622-96-8	< 0.2	< 0.04	0.2	878	
Hexachlorobutadiene	87-68-3	< 0.2	< 0.02	0.2	1036	
Hexane (C 6)	110-54-3	**0.8**	**0.2**	0.2	562	
Isooctane	540-84-1	< 0.2	< 0.04	0.2	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**120**	**47**	1.0	517	J*
Isopropylbenzene	98-82-8	< 0.2	< 0.04	0.2	846	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.6**	**0.1**	0.2	924	
Methacrylonitrile	126-98-7	< 0.2	< 0.07	0.2	600	
Methyl methacrylate	80-62-6	< 0.2	< 0.06	0.2	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.2	< 0.06	0.2	547	MTBE
2-Methyl-1-propanol	78-83-1	< 0.2	< 0.07	0.2		Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**2.2**	**0.5**	0.2	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.2	< 0.06	0.2	595	
Methylene Chloride	75-09-2	**0.4**	**0.1**	0.2	533	
2-Methylnaphthalene	91-57-6	< 0.4	< 0.07	0.4	1095	
Naphthalene	91-20-3	< 0.4	< 0.08	0.4	1042	
Nitrobenzene	98-95-3	< 0.8	< 0.2	0.8	999	
Pentachloroethane	76-01-7	< 0.2	< 0.03	0.2	902	
Propionitrile	107-12-0	< 0.2	< 0.09	0.2	593	
n-Propylbenzene	103-65-1	< 0.2	< 0.04	0.2	871	
Styrene	100-42-5	**0.5**	**0.1**	0.2	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.2	< 0.03	0.2	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.2	< 0.03	0.2	794	
Tetrachloroethene	127-18-4	< 0.2	< 0.03	0.2	746	
Tetrahydrofuran	109-99-9	< 0.2	< 0.07	0.2	604	
Toluene	108-88-3	**3.3**	**0.9**	0.2	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.07**	0.2	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.2	< 0.03	0.2	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.2	< 0.03	0.2	1052	
1,1,2-Trichloroethane	79-00-5	< 0.2	< 0.04	0.2	739	
1,1,1-Trichloroethane	71-55-6	< 0.2	< 0.04	0.2	616	
Trichloroethene	79-01-6	< 0.2	< 0.04	0.2	660	
1,2,3-Trichloropropane	96-18-4	< 0.2	< 0.03	0.2	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.2	< 0.04	0.2	881	
1,2,4-Trimethylbenzene	95-63-6	< 0.2	< 0.04	0.2	903	
m,p-Xylene	108-38-3; 106-42-3	**1.1**	**0.2**	0.4	802	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.4**	**0.09**	0.2	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	8	1	4	963	
Acetaldehyde	75-07-0	51	28	4	399	
Benzaldehyde	100-52-7	7	2	4	903	
Butane (C 4)	106-97-8	9	4	4	384	
1-Butanol	71-36-3	27	9	4	654	
2-Butoxyethanol	111-76-2	24	5	4	843	
Butoxyethoxyethanol	112-34-5	42	6	4	1029	
4-tert-Butylcyclohexyl acetate	32210-23-4	6	0.7	4	1078	
C12-C14 Hydrocarbon	N/A	10	N/A	4	1051	Contains silicon and oxygen; appears to be a siloxane
C12-C14 Hydrocarbon	N/A	5	N/A	4	1037	Cyclic; may be a terpene
C7-C9 Hydrocarbon	N/A	10	N/A	4	755	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS); one is hexanal (CAS)
Decanal	112-31-2	6	0.9	4	1032	
Diethylene glycol ethyl ether	111-90-0	15	3	4	922	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	450	73	4	912	DPGME
Dodecane (C 12)	112-40-3	8	1	4	1008	
2-Ethyl-1-hexanol	104-76-7	18	3	4	936	
Ethylene Glycol	107-21-1	53	20	4	714	
Isobutane	75-28-5	9	4	4	359	
Isohexadecane	4390-04-9	7	0.7	4	1077	
Isoprene	78-79-5	8	3	4	497	
Limonene	138-86-3 or 5989-27-5	70	12	4	923	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Methoxy-2-propanol	107-98-2	7	2	4	654	PGME
2-Methylbutane	78-78-4	5	2	4	447	
Nonanal	124-19-6	5	0.8	4	983	
Octamethylcyclotetrasiloxane (D4)	556-67-2	6	0.5	4	859	
Pentane (C 5)	109-66-0	25	8	4	475	
1-Propanol	71-23-8	6	2	4	569	
n-Propylacetate	109-60-4	9	2	4	674	
Propylene glycol	57-55-6	14	5	4	747	
Tetradecane (C 14)	629-59-4	5	0.6	4	1097	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	47	5	4	1135	
Texanol-A	74367-33-2	240	26	4	1122	
Texanol-B	74367-34-3	300	34	4	1127	
Tridecane (C 13)	629-50-5	6	0.8	4	1054	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Enthalpy Analytical, LLC (MTP)
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	51	28	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetone	67-64-1	62	26	400 - 11,745,000	sweet, fruity, etherous
Acetonitrile	75-05-8	0.6	0.4	13,000 - 1,161,000	etherish
Benzaldehyde	100-52-7	7	2	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.4	0.1	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	9	4	421 - 5,048,000	natural gas
1-Butanol	71-36-3	27	9	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	24	5	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.7	0.1	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
Chloroform	67-66-3	0.3	0.05	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.3	0.08	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	3.1	0.5	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	15	3	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	1400	720	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	18	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	3.4	0.9	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.4	0.09	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	53	20	5,120 -	-
Hexane (C 6)	110-54-3	0.8	0.2	1,500 - 248,000	gasoline
Isoprene	78-79-5	8	3	47 - 3,590	aromatic
Isopropanol	67-63-0	120	47	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	70	12	2 - 310	lemon, plastic, citrus, rubber, terpeny
Methoxy-2-propanol	107-98-2	7	2	8,390 - 33,000	etherish, ammonia
4-Methyl-2-pentanone	108-10-1	2.2	0.5	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet

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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Methylene Chloride	75-09-2	0.4	0.1	1,200 - 440,000	sweet
Naphthalene	91-20-3	< 0.4	< 0.08	2 - 1,012	tar, creosote, mothballs, empyreumatic
Pentane (C 5)	109-66-0	25	8	1,290 - 1,147,000	sweet
1-Propanol	71-23-8	6	2	31 - 10,172,000	sweet, alcohol
n-Propylacetate	109-60-4	9	2	48 - 87,000	sweet, ester
Propylene glycol	57-55-6	14	5	5,140 -	-
Styrene	100-42-5	0.5	0.1	3 - 61,000	sharp, sweet
Toluene	108-88-3	3.3	0.9	21 - 157,000	sour, burnt
m,p-Xylene	108-38-3; 106-42-3	1.1	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.4	0.09	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.4	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.7	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.3	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	3.1	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.4	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.4	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Naphthalene	91-20-3	< 0.4	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide
Styrene	100-42-5	0.5	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Toluene	108-88-3	3.3	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	1.1	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.4	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of th uality indicators. It allows comparison of multiple samples with each other or with target l The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to µg/m³.

Reporting Units - ppb: Some sections o $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or µg/m³ can be converted easily to ppb using the following formula derived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as th $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, can be determined using the following formula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x

RTn – retention time of n-alkane eluting before target compound x
RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Ste 117 Jericho, NY 11753 US	**COC:** **Laboratory ID:**	**99670** **99670-3**
Sampled By:	James Harvey		
Project:	Marshall H.S.21111804		
Location:	805 S. Miami Ave. Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	03/31/2022 03/31/2022 03/31/2022 04/05/2022
Client Sample ID:	Rm 3		
Volume:	24 L		
Date Sampled:	03/30/2022		
Sample Type:	TDT AK347		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. Sample Summary: listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	4200	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	6	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Texanol-B	74367-34-3	280	31	4	1127	
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	240	39	4	912	DPGME
Texanol-A	74367-33-2	220	25	4	1122	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	790	410	2.1	480	J*
Isopropanol	67-63-0	130	52	1.0	517	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**49**	**20**	1.0	509	
Acetonitrile	75-05-8	< 0.4	< 0.2	0.4	522	
Acrylonitrile	107-13-1	< 0.2	< 0.09	0.2	543	
Benzene	71-43-2	**0.4**	**0.1**	0.2	631	
Bromobenzene	108-86-1	< 0.2	< 0.03	0.2	866	
Bromochloromethane	74-97-5	< 0.2	< 0.04	0.2	603	
Bromodichloromethane	75-27-4	< 0.2	< 0.03	0.2	682	
Bromoform	75-25-2	< 0.2	< 0.02	0.2	837	
1,3-Butadiene	106-99-0	< 0.2	< 0.09	0.2	389	
tert-Butylbenzene	98-06-6	< 0.2	< 0.04	0.2	900	
sec-Butylbenzene	135-98-8	< 0.2	< 0.04	0.2	914	
n-Butylbenzene	104-51-8	< 0.2	< 0.04	0.2	949	
Carbon Disulfide	75-15-0	< 0.2	< 0.07	0.2	520	
Carbon Tetrachloride	56-23-5	**0.7**	**0.1**	0.2	623	
Chlorobenzene	108-90-7	< 0.2	< 0.04	0.2	791	
Chlorodibromomethane	124-48-1	< 0.2	< 0.02	0.2	759	
2-Chloroethanol	107-07-3	< 0.2	< 0.06	0.2	675	
Chloroform	67-66-3	**0.2**	**0.05**	0.2	608	
Chloroprene	126-99-8	< 0.2	< 0.06	0.2	571	
3-Chloropropene	107-05-1	< 0.2	< 0.07	0.2	527	
4-Chlorotoluene	106-43-4	< 0.2	< 0.04	0.2	883	
2-Chlorotoluene	95-49-8	< 0.2	< 0.04	0.2	877	
Cyclohexane	110-82-7	**0.3**	**0.07**	0.2	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.4	< 0.04	0.4	991	

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Laboratory ID: 99670-3

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.2	< 0.03	0.2	766	
Dibromomethane	74-95-3	< 0.2	< 0.03	0.2	674	
trans 1,4-Dichloro-2-butene	110-57-6	< 0.2	< 0.04	0.2	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.2	< 0.04	0.2	848	
1,2-Dichlorobenzene	95-50-1	< 0.2	< 0.03	0.2	951	
1,3-Dichlorobenzene	541-73-1	< 0.2	< 0.03	0.2	923	
1,4-Dichlorobenzene	106-46-7	**2.5**	**0.4**	0.2	930	
1,1-Dichloroethane	75-34-3	< 0.2	< 0.05	0.2	567	
1,2-Dichloroethane	107-06-2	< 0.2	< 0.05	0.2	633	
cis 1,2-Dichloroethene	156-59-2	< 0.2	< 0.05	0.2	593	
trans 1,2-Dichloroethene	156-60-5	< 0.2	< 0.05	0.2	548	
1,1-Dichloroethene	75-35-4	< 0.2	< 0.05	0.2	508	
2,2-Dichloropropane	594-20-7	< 0.2	< 0.04	0.2	593	
1,2-Dichloropropane	78-87-5	< 0.2	< 0.04	0.2	670	
1,3-Dichloropropane	142-28-9	< 0.2	< 0.04	0.2	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.2	< 0.05	0.2	729	
1,1-Dichloropropene	563-58-6	< 0.2	< 0.05	0.2	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.2	< 0.05	0.2	701	
Diethyl ether	60-29-7	< 0.2	< 0.07	0.2	493	
1,4-Dioxane	123-91-1	< 0.4	< 0.1	0.4	673	
Ethanol	64-17-5	**790**	**410**	2.1	480	J*
Ethylacetate	141-78-6	**2.3**	**0.6**	0.2	594	
Ethylbenzene	100-41-4	**0.4**	**0.08**	0.2	795	
Ethylmethacrylate	97-63-2	< 0.2	< 0.04	0.2	731	
4-Ethyltoluene	622-96-8	< 0.2	< 0.04	0.2	878	
Hexachlorobutadiene	87-68-3	< 0.2	< 0.02	0.2	1036	
Hexane (C 6)	110-54-3	**0.8**	**0.2**	0.2	562	
Isooctane	540-84-1	< 0.2	< 0.04	0.2	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**130**	**52**	1.0	517	J*
Isopropylbenzene	98-82-8	< 0.2	< 0.04	0.2	846	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.4**	**0.07**	0.2	924	
Methacrylonitrile	126-98-7	< 0.2	< 0.07	0.2	600	
Methyl methacrylate	80-62-6	< 0.2	< 0.06	0.2	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.2	< 0.06	0.2	547	MTBE
2-Methyl-1-propanol	78-83-1	**0.9**	**0.3**	0.2	625	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.3**	**0.3**	0.2	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.2	< 0.06	0.2	595	
Methylene Chloride	75-09-2	**0.5**	**0.1**	0.2	533	
2-Methylnaphthalene	91-57-6	< 0.4	< 0.07	0.4	1095	
Naphthalene	91-20-3	< 0.4	< 0.08	0.4	1042	
Nitrobenzene	98-95-3	< 0.8	< 0.2	0.8	999	
Pentachloroethane	76-01-7	< 0.2	< 0.03	0.2	902	
Propionitrile	107-12-0	< 0.2	< 0.09	0.2	593	
n-Propylbenzene	103-65-1	< 0.2	< 0.04	0.2	871	
Styrene	100-42-5	**0.5**	**0.1**	0.2	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.2	< 0.03	0.2	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.2	< 0.03	0.2	794	
Tetrachloroethene	127-18-4	< 0.2	< 0.03	0.2	746	
Tetrahydrofuran	109-99-9	< 0.2	< 0.07	0.2	604	
Toluene	108-88-3	**3.1**	**0.8**	0.2	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.07**	0.2	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.2	< 0.03	0.2	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.2	< 0.03	0.2	1052	
1,1,2-Trichloroethane	79-00-5	< 0.2	< 0.04	0.2	739	
1,1,1-Trichloroethane	71-55-6	< 0.2	< 0.04	0.2	616	
Trichloroethene	79-01-6	< 0.2	< 0.04	0.2	660	
1,2,3-Trichloropropane	96-18-4	< 0.2	< 0.03	0.2	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.2	< 0.04	0.2	881	
1,2,4-Trimethylbenzene	95-63-6	< 0.2	< 0.04	0.2	903	
m,p-Xylene	108-38-3; 106-42-3	**0.9**	**0.2**	0.4	802	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.3**	**0.07**	0.2	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	5	0.7	4	963	
Acetaldehyde	75-07-0	22	12	4	399	
Benzaldehyde	100-52-7	5	1	4	903	
Butane (C 4)	106-97-8	10	4	4	384	
1-Butanol	71-36-3	23	8	4	653	
2-Butoxyethanol	111-76-2	17	3	4	843	
Butoxyethoxyethanol	112-34-5	17	3	4	1029	
C12-C14 Hydrocarbon	N/A	7	N/A	4	1051	Contains silicon and oxygen; appears to be a siloxane
C14-C16 Hydrocarbon	N/A	4	N/A	4	1210	May contain oxygen
C7-C9 Hydrocarbon	N/A	9	N/A	4	755	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS); one is hexanal (CAS)
Decanal	112-31-2	5	0.8	4	1032	
Diethylene glycol ethyl ether	111-90-0	11	2	4	922	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	240	39	4	912	DPGME
Dodecane (C 12)	112-40-3	6	0.8	4	1008	
2-Ethyl-1-hexanol	104-76-7	19	3	4	936	
Ethylene Glycol	107-21-1	73	28	4	715	
Isobutane	75-28-5	10	4	4	359	
Isohexadecane	4390-04-9	6	0.6	4	1077	
Isoprene	78-79-5	6	2	4	497	
Limonene	138-86-3 or 5989-27-5	23	4	4	923	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
Methoxy-2-propanol	107-98-2	6	2	4	654	PGME

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
2-Methylbutane	78-78-4	5	2	4	447	
Pentane (C 5)	109-66-0	18	6	4	475	
n-Propylacetate	109-60-4	5	1	4	674	
Propylene glycol	57-55-6	13	4	4	747	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	12	1	4	1135	
Texanol-A	74367-33-2	220	25	4	1122	
Texanol-B	74367-34-3	280	31	4	1127	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Enthalpy Analytical, LLC (MTP)
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	22	12	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetone	67-64-1	49	20	400 - 11,745,000	sweet, fruity, etherous
Benzaldehyde	100-52-7	5	1	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.4	0.1	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	10	4	421 - 5,048,000	natural gas
1-Butanol	71-36-3	23	8	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	17	3	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.7	0.1	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
Chloroform	67-66-3	0.2	0.05	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.3	0.07	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	2.5	0.4	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	11	2	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	790	410	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	19	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	2.3	0.6	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.4	0.08	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	73	28	5,120 -	-
Hexane (C 6)	110-54-3	0.8	0.2	1,500 - 248,000	gasoline
Isoprene	78-79-5	6	2	47 - 3,590	aromatic
Isopropanol	67-63-0	130	52	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	23	4	2 - 310	lemon, plastic, citrus, rubber, terpeny
Methoxy-2-propanol	107-98-2	6	2	8,390 - 33,000	etherish, ammonia
2-Methyl-1-propanol	78-83-1	0.9	0.3	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex
4-Methyl-2-pentanone	108-10-1	1.3	0.3	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet

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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Methylene Chloride	75-09-2	0.5	0.1	1,200 - 440,000	sweet
Pentane (C 5)	109-66-0	18	6	1,290 - 1,147,000	sweet
n-Propylacetate	109-60-4	5	1	48 - 87,000	sweet, ester
Propylene glycol	57-55-6	13	4	5,140 -	-
Styrene	100-42-5	0.5	0.1	3 - 61,000	sharp, sweet
Toluene	108-88-3	3.1	0.8	21 - 157,000	sour, burnt
m,p-Xylene	108-38-3; 106-42-3	0.9	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.3	0.07	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.4	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.7	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.2	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	2.5	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.4	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.5	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Styrene	100-42-5	0.5	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Toluene	108-88-3	3.1	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	0.9	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of th uality indicators. It allows comparison of multiple samples with each other or with target l The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily to ppb using the following formula derived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as th $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, can be determined using the following formula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x

RTn – retention time of n-alkane eluting before target compound x
RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Ste 117 Jericho, NY 11753 US	**COC:** **Laboratory ID:**	**99670** **99670-4**
Sampled By:	James Harvey		
Project:	Marshall H.S.21111804		
Location:	805 S. Miami Ave. Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	03/31/2022 03/31/2022 03/31/2022 04/05/2022
Client Sample ID:	Rm 4		
Volume:	24 L		
Date Sampled:	03/30/2022		
Sample Type:	TDT AG316		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. Sample Summary: listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	5000	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	7	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Texanol-B	74367-34-3	330	37	4	1127	
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	320	52	4	912	DPGME
Texanol-A	74367-33-2	260	29	4	1122	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	1100	580	2.1	480	J*
Isopropanol	67-63-0	110	46	1.0	517	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**48**	**20**	1.0	509	
Acetonitrile	75-05-8	**0.6**	**0.4**	0.4	522	
Acrylonitrile	107-13-1	< 0.2	< 0.09	0.2	543	
Benzene	71-43-2	**0.4**	**0.1**	0.2	631	
Bromobenzene	108-86-1	< 0.2	< 0.03	0.2	866	
Bromochloromethane	74-97-5	< 0.2	< 0.04	0.2	603	
Bromodichloromethane	75-27-4	< 0.2	< 0.03	0.2	682	
Bromoform	75-25-2	< 0.2	< 0.02	0.2	837	
1,3-Butadiene	106-99-0	< 0.2	< 0.09	0.2	389	
tert-Butylbenzene	98-06-6	< 0.2	< 0.04	0.2	900	
sec-Butylbenzene	135-98-8	< 0.2	< 0.04	0.2	914	
n-Butylbenzene	104-51-8	< 0.2	< 0.04	0.2	949	
Carbon Disulfide	75-15-0	< 0.2	< 0.07	0.2	520	
Carbon Tetrachloride	56-23-5	**0.7**	**0.1**	0.2	623	
Chlorobenzene	108-90-7	< 0.2	< 0.04	0.2	791	
Chlorodibromomethane	124-48-1	< 0.2	< 0.02	0.2	759	
2-Chloroethanol	107-07-3	< 0.2	< 0.06	0.2	675	
Chloroform	67-66-3	**0.2**	**0.05**	0.2	608	
Chloroprene	126-99-8	< 0.2	< 0.06	0.2	571	
3-Chloropropene	107-05-1	< 0.2	< 0.07	0.2	527	
4-Chlorotoluene	106-43-4	< 0.2	< 0.04	0.2	883	
2-Chlorotoluene	95-49-8	< 0.2	< 0.04	0.2	877	
Cyclohexane	110-82-7	**0.3**	**0.1**	0.2	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.4	< 0.04	0.4	991	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.2	< 0.03	0.2	766	
Dibromomethane	74-95-3	< 0.2	< 0.03	0.2	674	
trans 1,4-Dichloro-2-butene	110-57-6	< 0.2	< 0.04	0.2	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.2	< 0.04	0.2	848	
1,2-Dichlorobenzene	95-50-1	< 0.2	< 0.03	0.2	951	
1,3-Dichlorobenzene	541-73-1	< 0.2	< 0.03	0.2	923	
1,4-Dichlorobenzene	106-46-7	**2.3**	**0.4**	0.2	930	
1,1-Dichloroethane	75-34-3	< 0.2	< 0.05	0.2	567	
1,2-Dichloroethane	107-06-2	< 0.2	< 0.05	0.2	633	
cis 1,2-Dichloroethene	156-59-2	< 0.2	< 0.05	0.2	593	
trans 1,2-Dichloroethene	156-60-5	< 0.2	< 0.05	0.2	548	
1,1-Dichloroethene	75-35-4	< 0.2	< 0.05	0.2	508	
2,2-Dichloropropane	594-20-7	< 0.2	< 0.04	0.2	593	
1,2-Dichloropropane	78-87-5	< 0.2	< 0.04	0.2	670	
1,3-Dichloropropane	142-28-9	< 0.2	< 0.04	0.2	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.2	< 0.05	0.2	729	
1,1-Dichloropropene	563-58-6	< 0.2	< 0.05	0.2	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.2	< 0.05	0.2	701	
Diethyl ether	60-29-7	< 0.2	< 0.07	0.2	493	
1,4-Dioxane	123-91-1	< 0.4	< 0.1	0.4	673	
Ethanol	64-17-5	**1100**	**580**	2.1	480	J*
Ethylacetate	141-78-6	**4.8**	**1.3**	0.2	594	
Ethylbenzene	100-41-4	**0.4**	**0.1**	0.2	795	
Ethylmethacrylate	97-63-2	< 0.2	< 0.04	0.2	731	
4-Ethyltoluene	622-96-8	< 0.2	< 0.04	0.2	878	
Hexachlorobutadiene	87-68-3	< 0.2	< 0.02	0.2	1036	
Hexane (C 6)	110-54-3	**0.8**	**0.2**	0.2	562	
Isooctane	540-84-1	< 0.2	< 0.04	0.2	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**110**	**46**	1.0	517	J*
Isopropylbenzene	98-82-8	< 0.2	< 0.04	0.2	846	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.4**	**0.07**	0.2	924	
Methacrylonitrile	126-98-7	< 0.2	< 0.07	0.2	600	
Methyl methacrylate	80-62-6	< 0.2	< 0.06	0.2	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.2	< 0.06	0.2	547	MTBE
2-Methyl-1-propanol	78-83-1	**0.8**	**0.3**	0.2	625	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.3**	**0.3**	0.2	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.2	< 0.06	0.2	595	
Methylene Chloride	75-09-2	**0.5**	**0.1**	0.2	533	
2-Methylnaphthalene	91-57-6	< 0.4	< 0.07	0.4	1095	
Naphthalene	91-20-3	< 0.4	< 0.08	0.4	1042	
Nitrobenzene	98-95-3	< 0.8	< 0.2	0.8	999	
Pentachloroethane	76-01-7	< 0.2	< 0.03	0.2	902	
Propionitrile	107-12-0	< 0.2	< 0.09	0.2	593	
n-Propylbenzene	103-65-1	< 0.2	< 0.04	0.2	871	
Styrene	100-42-5	**0.6**	**0.1**	0.2	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.2	< 0.03	0.2	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.2	< 0.03	0.2	794	
Tetrachloroethene	127-18-4	< 0.2	< 0.03	0.2	746	
Tetrahydrofuran	109-99-9	< 0.2	< 0.07	0.2	604	
Toluene	108-88-3	**3.6**	**0.9**	0.2	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.07**	0.2	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.2	< 0.03	0.2	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.2	< 0.03	0.2	1052	
1,1,2-Trichloroethane	79-00-5	< 0.2	< 0.04	0.2	739	
1,1,1-Trichloroethane	71-55-6	< 0.2	< 0.04	0.2	616	
Trichloroethene	79-01-6	< 0.2	< 0.04	0.2	660	
1,2,3-Trichloropropane	96-18-4	< 0.2	< 0.03	0.2	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.2	< 0.04	0.2	881	
1,2,4-Trimethylbenzene	95-63-6	< 0.2	< 0.04	0.2	903	
m,p-Xylene	108-38-3; 106-42-3	**1.1**	**0.3**	0.4	802	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.4**	**0.09**	0.2	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	4	0.6	4	963	
Acetaldehyde	75-07-0	33	18	4	399	
Benzaldehyde	100-52-7	6	1	4	903	
Butane (C 4)	106-97-8	13	5	4	384	
1-Butanol	71-36-3	36	12	4	653	
1-Butoxy-2-propanol	5131-66-8	5	0.9	4	864	
2-Butoxyethanol	111-76-2	26	5	4	843	
Butoxyethoxyethanol	112-34-5	18	3	4	1029	
C12-C14 Hydrocarbon	N/A	5	N/A	4	1051	Contains silicon and oxygen; appears to be a siloxane
C7-C9 Hydrocarbon	N/A	11	N/A	4	755	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS); one is hexanal (CAS)
Diethylene glycol ethyl ether	111-90-0	8	1	4	922	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	320	52	4	912	DPGME
Dodecane (C 12)	112-40-3	7	1	4	1008	
2-Ethyl-1-hexanol	104-76-7	18	3	4	936	
Ethylene Glycol	107-21-1	58	22	4	714	
Isobutane	75-28-5	9	4	4	359	
Isohexadecane	4390-04-9	5	0.6	4	1077	
Isoprene	78-79-5	4	2	4	497	
Limonene	138-86-3 or 5989-27-5	22	4	4	923	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
Methoxy-2-propanol	107-98-2	6	2	4	654	PGME
2-Methylbutane	78-78-4	6	2	4	447	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Nonanal	124-19-6	6	1	4	983	
Pentane (C 5)	109-66-0	17	6	4	475	
Propylene glycol	57-55-6	8	3	4	747	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	9	0.9	4	1135	
Texanol-A	74367-33-2	260	29	4	1122	
Texanol-B	74367-34-3	330	37	4	1127	
Tridecane (C 13)	629-50-5	5	0.7	4	1054	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Enthalpy Analytical, LLC (MTP)
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	33	18	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetone	67-64-1	48	20	400 - 11,745,000	sweet, fruity, etherous
Acetonitrile	75-05-8	0.6	0.4	13,000 - 1,161,000	etherish
Benzaldehyde	100-52-7	6	1	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.4	0.1	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	13	5	421 - 5,048,000	natural gas
1-Butanol	71-36-3	36	12	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	26	5	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.7	0.1	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
Chloroform	67-66-3	0.2	0.05	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.3	0.1	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	2.3	0.4	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	8	1	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	1100	580	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	18	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	4.8	1.3	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.4	0.1	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	58	22	5,120 -	-
Hexane (C 6)	110-54-3	0.8	0.2	1,500 - 248,000	gasoline
Isoprene	78-79-5	4	2	47 - 3,590	aromatic
Isopropanol	67-63-0	110	46	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	22	4	2 - 310	lemon, plastic, citrus, rubber, terpeny
Methoxy-2-propanol	107-98-2	6	2	8,390 - 33,000	etherish, ammonia
2-Methyl-1-propanol	78-83-1	0.8	0.3	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex

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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
4-Methyl-2-pentanone	108-10-1	1.3	0.3	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	0.5	0.1	1,200 - 440,000	sweet
Pentane (C 5)	109-66-0	17	6	1,290 - 1,147,000	sweet
Propylene glycol	57-55-6	8	3	5,140 -	-
Styrene	100-42-5	0.6	0.1	3 - 61,000	sharp, sweet
Toluene	108-88-3	3.6	0.9	21 - 157,000	sour, burnt
m,p-Xylene	108-38-3; 106-42-3	1.1	0.3	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.4	0.09	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.4	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.7	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.2	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	2.3	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.4	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.5	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Styrene	100-42-5	0.6	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Toluene	108-88-3	3.6	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	1.1	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.4	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of th uality indicators. It allows comparison of multiple samples with each other or with target l The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{[\frac{(A_s - A_b) \times W_s}{A_i}]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to µg/m³.

Reporting Units - ppb: Some sections o $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or µg/m³ can be converted easily to ppb using the following formula derived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as th $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, can be determined using the following formula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x

RTn – retention time of n-alkane eluting before target compound x
RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Ste 117 Jericho, NY 11753 US	**COC:** **Laboratory ID:**	**99670** **99670-5**
Sampled By:	James Harvey		
Project:	Marshall H.S.21111804		
Location:	805 S. Miami Ave. Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	03/31/2022 03/31/2022 03/31/2022 04/05/2022
Client Sample ID:	Library		
Volume:	24 L		
Date Sampled:	03/30/2022		
Sample Type:	TDT WW785		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. Sample Summary: listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	< 200	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	< 3	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	8.8	4.6	2.1	480	
Ethylacetate	141-78-6	0.4	0.1	0.2	594	

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	< 1	< 0.4	1.0	509	
Acetonitrile	75-05-8	< 0.4	< 0.2	0.4	522	
Acrylonitrile	107-13-1	< 0.2	< 0.09	0.2	543	
Benzene	71-43-2	< 0.2	< 0.06	0.2	631	
Bromobenzene	108-86-1	< 0.2	< 0.03	0.2	866	
Bromochloromethane	74-97-5	< 0.2	< 0.04	0.2	603	
Bromodichloromethane	75-27-4	< 0.2	< 0.03	0.2	682	
Bromoform	75-25-2	< 0.2	< 0.02	0.2	837	
1,3-Butadiene	106-99-0	< 0.2	< 0.09	0.2	389	
tert-Butylbenzene	98-06-6	< 0.2	< 0.04	0.2	900	
sec-Butylbenzene	135-98-8	< 0.2	< 0.04	0.2	914	
n-Butylbenzene	104-51-8	< 0.2	< 0.04	0.2	949	
Carbon Disulfide	75-15-0	< 0.2	< 0.07	0.2	520	
Carbon Tetrachloride	56-23-5	< 0.2	< 0.03	0.2	623	
Chlorobenzene	108-90-7	< 0.2	< 0.04	0.2	791	
Chlorodibromomethane	124-48-1	< 0.2	< 0.02	0.2	759	
2-Chloroethanol	107-07-3	< 0.2	< 0.06	0.2	675	
Chloroform	67-66-3	< 0.2	< 0.04	0.2	608	
Chloroprene	126-99-8	< 0.2	< 0.06	0.2	571	
3-Chloropropene	107-05-1	< 0.2	< 0.07	0.2	527	
4-Chlorotoluene	106-43-4	< 0.2	< 0.04	0.2	883	
2-Chlorotoluene	95-49-8	< 0.2	< 0.04	0.2	877	
Cyclohexane	110-82-7	< 0.2	< 0.06	0.2	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.4	< 0.04	0.4	991	

Client Sample ID: Library
Laboratory ID: 99670-5

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.2	< 0.03	0.2	766	
Dibromomethane	74-95-3	< 0.2	< 0.03	0.2	674	
trans 1,4-Dichloro-2-butene	110-57-6	< 0.2	< 0.04	0.2	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.2	< 0.04	0.2	848	
1,2-Dichlorobenzene	95-50-1	< 0.2	< 0.03	0.2	951	
1,3-Dichlorobenzene	541-73-1	< 0.2	< 0.03	0.2	923	
1,4-Dichlorobenzene	106-46-7	< 0.2	< 0.03	0.2	930	
1,1-Dichloroethane	75-34-3	< 0.2	< 0.05	0.2	567	
1,2-Dichloroethane	107-06-2	< 0.2	< 0.05	0.2	633	
cis 1,2-Dichloroethene	156-59-2	< 0.2	< 0.05	0.2	593	
trans 1,2-Dichloroethene	156-60-5	< 0.2	< 0.05	0.2	548	
1,1-Dichloroethene	75-35-4	< 0.2	< 0.05	0.2	508	
2,2-Dichloropropane	594-20-7	< 0.2	< 0.04	0.2	593	
1,2-Dichloropropane	78-87-5	< 0.2	< 0.04	0.2	670	
1,3-Dichloropropane	142-28-9	< 0.2	< 0.04	0.2	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.2	< 0.05	0.2	729	
1,1-Dichloropropene	563-58-6	< 0.2	< 0.05	0.2	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.2	< 0.05	0.2	701	
Diethyl ether	60-29-7	< 0.2	< 0.07	0.2	493	
1,4-Dioxane	123-91-1	< 0.4	< 0.1	0.4	673	
Ethanol	64-17-5	< 2.1	< 1.1	2.1	480	
Ethanol	64-17-5	**8.8**	**4.6**	2.1	480	
Ethylacetate	141-78-6	< 0.2	< 0.06	0.2	594	
Ethylacetate	141-78-6	**0.4**	**0.1**	0.2	594	
Ethylbenzene	100-41-4	< 0.2	< 0.05	0.2	795	
Ethylmethacrylate	97-63-2	< 0.2	< 0.04	0.2	731	
4-Ethyltoluene	622-96-8	< 0.2	< 0.04	0.2	878	
Hexachlorobutadiene	87-68-3	< 0.2	< 0.02	0.2	1036	
Hexane (C 6)	110-54-3	< 0.2	< 0.06	0.2	562	
Isooctane	540-84-1	< 0.2	< 0.04	0.2	638	2,2,4-Trimethylpentane

Client Sample ID: Library
Laboratory ID: 99670-5

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Isopropanol	67-63-0	< 1	< 0.4	1.0	517	
Isopropylbenzene	98-82-8	< 0.2	< 0.04	0.2	846	
p-Isopropyltoluene	99-87-6	< 0.2	< 0.04	0.2	924	
Methacrylonitrile	126-98-7	< 0.2	< 0.07	0.2	600	
Methyl methacrylate	80-62-6	< 0.2	< 0.06	0.2	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.2	< 0.06	0.2	547	MTBE
2-Methyl-1-propanol	78-83-1	< 0.2	< 0.07	0.2		Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	< 0.2	< 0.05	0.2	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.2	< 0.06	0.2	595	
Methylene Chloride	75-09-2	< 0.2	< 0.06	0.2	533	
2-Methylnaphthalene	91-57-6	< 0.4	< 0.07	0.4	1095	
Naphthalene	91-20-3	< 0.4	< 0.08	0.4	1042	
Nitrobenzene	98-95-3	< 0.8	< 0.2	0.8	999	
Pentachloroethane	76-01-7	< 0.2	< 0.03	0.2	902	
Propionitrile	107-12-0	< 0.2	< 0.09	0.2	593	
n-Propylbenzene	103-65-1	< 0.2	< 0.04	0.2	871	
Styrene	100-42-5	< 0.2	< 0.05	0.2	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.2	< 0.03	0.2	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.2	< 0.03	0.2	794	
Tetrachloroethene	127-18-4	< 0.2	< 0.03	0.2	746	
Tetrahydrofuran	109-99-9	< 0.2	< 0.07	0.2	604	
Toluene	108-88-3	< 0.2	< 0.05	0.2	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	< 0.2	< 0.03	0.2	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.2	< 0.03	0.2	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.2	< 0.03	0.2	1052	
1,1,2-Trichloroethane	79-00-5	< 0.2	< 0.04	0.2	739	
1,1,1-Trichloroethane	71-55-6	< 0.2	< 0.04	0.2	616	
Trichloroethene	79-01-6	< 0.2	< 0.04	0.2	660	
1,2,3-Trichloropropane	96-18-4	< 0.2	< 0.03	0.2	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.2	< 0.04	0.2	881	

Client Sample ID: Library
Laboratory ID: 99670-5

Compound	CAS	Sample Concentration		Reporting Limit	RI	Additional Information
		ng/L	ppb	ng/L		
1,2,4-Trimethylbenzene	95-63-6	< 0.2	< 0.04	0.2	903	
m,p-Xylene	108-38-3; 106-42-3	< 0.4	< 0.09	0.4	802	
o-Xylene	95-47-6	< 0.2	< 0.05	0.2	825	

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

No Semiquantitative compounds are present in this sample.

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Enthalpy Analytical, LLC (MTP)
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Ethanol	64-17-5	8.8	4.6	90 - 40,334,000	vinous, alcohol
Ethylacetate	141-78-6	0.4	0.1	90 - 190,000	fruity, sweet, fingernail polish, etherous

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

No EPA Hazardous Air Pollutants are present in this sample.

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of th uality indicators. It allows comparison of multiple samples with each other or with target l $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ The following formula depicts the calcul Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily to ppb using the following formula derived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as th $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, can be determined using the following formula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x

RTn – retention time of n-alkane eluting before target compound x
RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Ste 117 Jericho, NY 11753 US	**COC:** **Laboratory ID:**	**99670** **99670-6**
Sampled By:	James Harvey		
Project:	Marshall H.S.21111804		
Location:	805 S. Miami Ave. Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	03/31/2022 03/31/2022 03/31/2022 04/05/2022
Client Sample ID:	Rm 26		
Volume:	24 L		
Date Sampled:	03/30/2022		
Sample Type:	TDT AC581		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

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2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	3800	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	4	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	270	44	4	913	DPGME
Texanol-B	74367-34-3	230	25	4	1129	
Texanol-A	74367-33-2	170	19	4	1124	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	720	380	2.1	483	J*
Acetone	67-64-1	49	20	1.0	511	

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**49**	**20**	1.0	511	
Acetonitrile	75-05-8	< 0.4	< 0.2	0.4	524	
Acrylonitrile	107-13-1	< 0.2	< 0.09	0.2	545	
Benzene	71-43-2	**0.4**	**0.1**	0.2	632	
Bromobenzene	108-86-1	< 0.2	< 0.03	0.2	866	
Bromochloromethane	74-97-5	< 0.2	< 0.04	0.2	604	
Bromodichloromethane	75-27-4	< 0.2	< 0.03	0.2	682	
Bromoform	75-25-2	< 0.2	< 0.02	0.2	838	
1,3-Butadiene	106-99-0	< 0.2	< 0.09	0.2	391	
tert-Butylbenzene	98-06-6	< 0.2	< 0.04	0.2	900	
sec-Butylbenzene	135-98-8	< 0.2	< 0.04	0.2	914	
n-Butylbenzene	104-51-8	< 0.2	< 0.04	0.2	949	
Carbon Disulfide	75-15-0	< 0.2	< 0.07	0.2	521	
Carbon Tetrachloride	56-23-5	**0.9**	**0.1**	0.2	624	
Chlorobenzene	108-90-7	< 0.2	< 0.04	0.2	792	
Chlorodibromomethane	124-48-1	< 0.2	< 0.02	0.2	760	
2-Chloroethanol	107-07-3	< 0.2	< 0.06	0.2	675	
Chloroform	67-66-3	**0.2**	**0.04**	0.2	609	
Chloroprene	126-99-8	< 0.2	< 0.06	0.2	573	
3-Chloropropene	107-05-1	< 0.2	< 0.07	0.2	529	
4-Chlorotoluene	106-43-4	< 0.2	< 0.04	0.2	884	
2-Chlorotoluene	95-49-8	< 0.2	< 0.04	0.2	877	
Cyclohexane	110-82-7	**0.2**	**0.07**	0.2	621	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.4	< 0.04	0.4	991	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.2	< 0.03	0.2	766	
Dibromomethane	74-95-3	< 0.2	< 0.03	0.2	675	
trans 1,4-Dichloro-2-butene	110-57-6	< 0.2	< 0.04	0.2	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.2	< 0.04	0.2	849	
1,2-Dichlorobenzene	95-50-1	< 0.2	< 0.03	0.2	951	
1,3-Dichlorobenzene	541-73-1	< 0.2	< 0.03	0.2	923	
1,4-Dichlorobenzene	106-46-7	**3.5**	**0.6**	0.2	930	
1,1-Dichloroethane	75-34-3	< 0.2	< 0.05	0.2	569	
1,2-Dichloroethane	107-06-2	< 0.2	< 0.05	0.2	634	
cis 1,2-Dichloroethene	156-59-2	< 0.2	< 0.05	0.2	594	
trans 1,2-Dichloroethene	156-60-5	< 0.2	< 0.05	0.2	549	
1,1-Dichloroethene	75-35-4	< 0.2	< 0.05	0.2	510	
2,2-Dichloropropane	594-20-7	< 0.2	< 0.04	0.2	594	
1,2-Dichloropropane	78-87-5	< 0.2	< 0.04	0.2	671	
1,3-Dichloropropane	142-28-9	< 0.2	< 0.04	0.2	749	
trans 1,3-Dichloropropene	10061-02-6	< 0.2	< 0.05	0.2	729	
1,1-Dichloropropene	563-58-6	< 0.2	< 0.05	0.2	624	
cis 1,3-Dichloropropene	10061-01-5	< 0.2	< 0.05	0.2	701	
Diethyl ether	60-29-7	< 0.2	< 0.07	0.2	497	
1,4-Dioxane	123-91-1	< 0.4	< 0.1	0.4	673	
Ethanol	64-17-5	**720**	**380**	2.1	483	J*
Ethylacetate	141-78-6	**2.0**	**0.6**	0.2	595	
Ethylbenzene	100-41-4	**0.3**	**0.07**	0.2	796	
Ethylmethacrylate	97-63-2	< 0.2	< 0.04	0.2	732	
4-Ethyltoluene	622-96-8	< 0.2	< 0.04	0.2	878	
Hexachlorobutadiene	87-68-3	< 0.2	< 0.02	0.2	1037	
Hexane (C 6)	110-54-3	**0.8**	**0.2**	0.2	563	
Isooctane	540-84-1	< 0.2	< 0.04	0.2	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**44**	**18**	1.0	519	
Isopropylbenzene	98-82-8	< 0.2	< 0.04	0.2	847	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.5**	**0.08**	0.2	924	
Methacrylonitrile	126-98-7	< 0.2	< 0.07	0.2	601	
Methyl methacrylate	80-62-6	< 0.2	< 0.06	0.2	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.2	< 0.06	0.2	549	MTBE
2-Methyl-1-propanol	78-83-1	< 0.2	< 0.07	0.2		Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**2.9**	**0.7**	0.2	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.2	< 0.06	0.2	596	
Methylene Chloride	75-09-2	**0.6**	**0.2**	0.2	535	
2-Methylnaphthalene	91-57-6	< 0.4	< 0.07	0.4	1096	
Naphthalene	91-20-3	**0.4**	**0.08**	0.4	1043	
Nitrobenzene	98-95-3	< 0.8	< 0.2	0.8	999	
Pentachloroethane	76-01-7	< 0.2	< 0.03	0.2	902	
Propionitrile	107-12-0	< 0.2	< 0.09	0.2	594	
n-Propylbenzene	103-65-1	< 0.2	< 0.04	0.2	871	
Styrene	100-42-5	**0.4**	**0.09**	0.2	826	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.2	< 0.03	0.2	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.2	< 0.03	0.2	796	
Tetrachloroethene	127-18-4	< 0.2	< 0.03	0.2	746	
Tetrahydrofuran	109-99-9	< 0.2	< 0.07	0.2	605	
Toluene	108-88-3	**3.1**	**0.8**	0.2	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.07**	0.2	512	
1,2,4-Trichlorobenzene	120-82-1	< 0.2	< 0.03	0.2	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.2	< 0.03	0.2	1053	
1,1,2-Trichloroethane	79-00-5	< 0.2	< 0.04	0.2	740	
1,1,1-Trichloroethane	71-55-6	< 0.2	< 0.04	0.2	617	
Trichloroethene	79-01-6	< 0.2	< 0.04	0.2	661	
1,2,3-Trichloropropane	96-18-4	< 0.2	< 0.03	0.2	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.2	< 0.04	0.2	881	
1,2,4-Trimethylbenzene	95-63-6	< 0.2	< 0.04	0.2	903	
m,p-Xylene	108-38-3; 106-42-3	**0.9**	**0.2**	0.4	803	

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Laboratory ID: 99670-6

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.3**	**0.06**	0.2	826	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	6	1	4	963	
Acetaldehyde	75-07-0	20	11	4	404	
Benzaldehyde	100-52-7	5	1	4	903	
Butane (C 4)	106-97-8	5	2	4	383	
1-Butanol	71-36-3	22	7	4	654	
2-Butoxyethanol	111-76-2	16	3	4	844	
Butoxyethoxyethanol	112-34-5	29	4	4	1030	
4-tert-Butylcyclohexyl acetate	32210-23-4	5	0.7	4	1080	
C12-C14 Hydrocarbon	N/A	7	N/A	4	1052	Contains silicon and oxygen; appears to be a siloxane
C7-C9 Hydrocarbon	N/A	7	N/A	4	756	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS); one is hexanal (CAS)
Decanal	112-31-2	7	1	4	1033	
Diethylene glycol ethyl ether	111-90-0	9	2	4	922	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	270	44	4	913	DPGME
Dodecane (C 12)	112-40-3	6	0.8	4	1009	
2-Ethyl-1-hexanol	104-76-7	15	3	4	936	
Ethylene Glycol	107-21-1	43	17	4	715	
Isobutane	75-28-5	4	2	4	340	
Isoprene	78-79-5	7	2	4	501	
Limonene	138-86-3 or 5989-27-5	25	4	4	923	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
Methoxy-2-propanol	107-98-2	7	2	4	655	PGME
Pentane (C 5)	109-66-0	27	9	4	479	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Propylene glycol	57-55-6	14	4	4	747	
Tetradecane (C 14)	629-59-4	4	0.5	4	1099	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	30	3	4	1136	
Texanol-A	74367-33-2	170	19	4	1124	
Texanol-B	74367-34-3	230	25	4	1129	
Tridecane (C 13)	629-50-5	5	0.6	4	1055	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

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Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	20	11	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetone	67-64-1	49	20	400 - 11,745,000	sweet, fruity, etherous
Benzaldehyde	100-52-7	5	1	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.4	0.1	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	5	2	421 - 5,048,000	natural gas
1-Butanol	71-36-3	22	7	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	16	3	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.9	0.1	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
Chloroform	67-66-3	0.2	0.04	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.2	0.07	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	3.5	0.6	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	9	2	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	720	380	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	15	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	2.0	0.6	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.3	0.07	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	43	17	5,120 -	-
Hexane (C 6)	110-54-3	0.8	0.2	1,500 - 248,000	gasoline
Isoprene	78-79-5	7	2	47 - 3,590	aromatic
Isopropanol	67-63-0	44	18	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	25	4	2 - 310	lemon, plastic, citrus, rubber, terpeny
Methoxy-2-propanol	107-98-2	7	2	8,390 - 33,000	etherish, ammonia
4-Methyl-2-pentanone	108-10-1	2.9	0.7	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	0.6	0.2	1,200 - 440,000	sweet

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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Naphthalene	91-20-3	0.4	0.08	2 - 1,012	tar, creosote, mothballs, empyreumatic
Pentane (C 5)	109-66-0	27	9	1,290 - 1,147,000	sweet
Propylene glycol	57-55-6	14	4	5,140 -	-
Styrene	100-42-5	0.4	0.09	3 - 61,000	sharp, sweet
Toluene	108-88-3	3.1	0.8	21 - 157,000	sour, burnt
m,p-Xylene	108-38-3; 106-42-3	0.9	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.3	0.06	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.4	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.9	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.2	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	3.5	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.6	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Naphthalene	91-20-3	0.4	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide
Styrene	100-42-5	0.4	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Toluene	108-88-3	3.1	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	0.9	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of th uality indicators. It allows comparison of multiple samples with each other or with target l The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{[\frac{(A_s - A_b) \times W_s}{A_i}]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily to ppb using the following formula derived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as th $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, can be determined using the following formula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x

RTn – retention time of n-alkane eluting before target compound x
RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Ste 117 Jericho, NY 11753 US	**COC:** **Laboratory ID:**	**99670** **99670-7**
Sampled By:	James Harvey		
Project:	Marshall H.S.21111804		
Location:	805 S. Miami Ave. Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	03/31/2022 03/31/2022 03/31/2022 04/05/2022
Client Sample ID:	SE Hallway B/W Rms 36 & 37		
Volume:	24 L		
Date Sampled:	03/30/2022		
Sample Type:	TDT AL007		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. Sample Summary: listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	3700	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	4	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	190	30	4	913	DPGME
Texanol-B	74367-34-3	170	19	4	1127	
Texanol-A	74367-33-2	130	15	4	1122	
Ethylene Glycol	107-21-1	91	35	4	715	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	820	430	2.1	480	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**46**	**19**	1.0	509	
Acetonitrile	75-05-8	< 0.4	< 0.2	0.4	522	
Acrylonitrile	107-13-1	< 0.2	< 0.09	0.2	543	
Benzene	71-43-2	**0.4**	**0.1**	0.2	631	
Bromobenzene	108-86-1	< 0.2	< 0.03	0.2	866	
Bromochloromethane	74-97-5	< 0.2	< 0.04	0.2	603	
Bromodichloromethane	75-27-4	< 0.2	< 0.03	0.2	682	
Bromoform	75-25-2	< 0.2	< 0.02	0.2	837	
1,3-Butadiene	106-99-0	< 0.2	< 0.09	0.2	389	
tert-Butylbenzene	98-06-6	< 0.2	< 0.04	0.2	900	
sec-Butylbenzene	135-98-8	< 0.2	< 0.04	0.2	914	
n-Butylbenzene	104-51-8	< 0.2	< 0.04	0.2	949	
Carbon Disulfide	75-15-0	< 0.2	< 0.07	0.2	520	
Carbon Tetrachloride	56-23-5	**1.4**	**0.2**	0.2	623	
Chlorobenzene	108-90-7	< 0.2	< 0.04	0.2	791	
Chlorodibromomethane	124-48-1	< 0.2	< 0.02	0.2	759	
2-Chloroethanol	107-07-3	< 0.2	< 0.06	0.2	675	
Chloroform	67-66-3	**0.2**	**0.04**	0.2	608	
Chloroprene	126-99-8	< 0.2	< 0.06	0.2	571	
3-Chloropropene	107-05-1	< 0.2	< 0.07	0.2	527	
4-Chlorotoluene	106-43-4	< 0.2	< 0.04	0.2	883	
2-Chlorotoluene	95-49-8	< 0.2	< 0.04	0.2	877	
Cyclohexane	110-82-7	**0.3**	**0.09**	0.2	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.4	< 0.04	0.4	991	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.2	< 0.03	0.2	766	
Dibromomethane	74-95-3	< 0.2	< 0.03	0.2	674	
trans 1,4-Dichloro-2-butene	110-57-6	< 0.2	< 0.04	0.2	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.2	< 0.04	0.2	848	
1,2-Dichlorobenzene	95-50-1	< 0.2	< 0.03	0.2	951	
1,3-Dichlorobenzene	541-73-1	< 0.2	< 0.03	0.2	923	
1,4-Dichlorobenzene	106-46-7	< 0.2	< 0.03	0.2	930	
1,4-Dichlorobenzene	106-46-7	**4.4**	**0.7**	0.2	930	
1,1-Dichloroethane	75-34-3	< 0.2	< 0.05	0.2	567	
1,2-Dichloroethane	107-06-2	< 0.2	< 0.05	0.2	633	
cis 1,2-Dichloroethene	156-59-2	< 0.2	< 0.05	0.2	593	
trans 1,2-Dichloroethene	156-60-5	< 0.2	< 0.05	0.2	548	
1,1-Dichloroethene	75-35-4	< 0.2	< 0.05	0.2	508	
2,2-Dichloropropane	594-20-7	< 0.2	< 0.04	0.2	593	
1,2-Dichloropropane	78-87-5	< 0.2	< 0.04	0.2	670	
1,3-Dichloropropane	142-28-9	< 0.2	< 0.04	0.2	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.2	< 0.05	0.2	729	
1,1-Dichloropropene	563-58-6	< 0.2	< 0.05	0.2	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.2	< 0.05	0.2	701	
Diethyl ether	60-29-7	< 0.2	< 0.07	0.2	493	
1,4-Dioxane	123-91-1	< 0.4	< 0.1	0.4	673	
Ethanol	64-17-5	**820**	**430**	2.1	480	J*
Ethylacetate	141-78-6	**2.3**	**0.6**	0.2	594	
Ethylbenzene	100-41-4	**0.3**	**0.07**	0.2	795	
Ethylmethacrylate	97-63-2	< 0.2	< 0.04	0.2	731	
4-Ethyltoluene	622-96-8	< 0.2	< 0.04	0.2	878	
Hexachlorobutadiene	87-68-3	< 0.2	< 0.02	0.2	1036	
Hexane (C 6)	110-54-3	**1.5**	**0.4**	0.2	562	
Isooctane	540-84-1	< 0.2	< 0.04	0.2	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**45**	**18**	1.0	517	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Isopropylbenzene	98-82-8	< 0.2	< 0.04	0.2	846	
p-Isopropyltoluene	99-87-6	**0.3**	**0.06**	0.2	924	
Methacrylonitrile	126-98-7	< 0.2	< 0.07	0.2	600	
Methyl methacrylate	80-62-6	< 0.2	< 0.06	0.2	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.2	< 0.06	0.2	547	MTBE
2-Methyl-1-propanol	78-83-1	< 0.2	< 0.07	0.2		Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.1**	**0.3**	0.2	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.2	< 0.06	0.2	595	
Methylene Chloride	75-09-2	**0.9**	**0.3**	0.2	533	
2-Methylnaphthalene	91-57-6	< 0.4	< 0.07	0.4	1095	
Naphthalene	91-20-3	**0.7**	**0.1**	0.4	1042	
Nitrobenzene	98-95-3	< 0.8	< 0.2	0.8	999	
Pentachloroethane	76-01-7	< 0.2	< 0.03	0.2	902	
Propionitrile	107-12-0	< 0.2	< 0.09	0.2	593	
n-Propylbenzene	103-65-1	< 0.2	< 0.04	0.2	871	
Styrene	100-42-5	**0.4**	**0.1**	0.2	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.2	< 0.03	0.2	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.2	< 0.03	0.2	794	
Tetrachloroethene	127-18-4	< 0.2	< 0.03	0.2	746	
Tetrahydrofuran	109-99-9	< 0.2	< 0.07	0.2	604	
Toluene	108-88-3	**3.6**	**1**	0.2	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.07**	0.2	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.2	< 0.03	0.2	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.2	< 0.03	0.2	1052	
1,1,2-Trichloroethane	79-00-5	< 0.2	< 0.04	0.2	739	
1,1,1-Trichloroethane	71-55-6	< 0.2	< 0.04	0.2	616	
Trichloroethene	79-01-6	< 0.2	< 0.04	0.2	660	
1,2,3-Trichloropropane	96-18-4	< 0.2	< 0.03	0.2	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.2	< 0.04	0.2	881	
1,2,4-Trimethylbenzene	95-63-6	< 0.2	< 0.04	0.2	903	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
m,p-Xylene	108-38-3; 106-42-3	**1**	**0.2**	0.4	802	
o-Xylene	95-47-6	**0.3**	**0.06**	0.2	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	4	0.7	4	963	
Acetaldehyde	75-07-0	26	14	4	399	
Benzaldehyde	100-52-7	5	1	4	903	
Butane (C 4)	106-97-8	5	2	4	384	
1-Butanol	71-36-3	17	6	4	654	
2-Butoxyethanol	111-76-2	13	3	4	843	
Butoxyethoxyethanol	112-34-5	16	2	4	1029	
C12-C14 Hydrocarbon	N/A	6	N/A	4	1051	Contains silicon and oxygen; appears to be a siloxane
C14-C16 Hydrocarbon	N/A	10	N/A	4	1210	May contain oxygen
C7-C9 Hydrocarbon	N/A	6	N/A	4	755	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS); one is hexanal (CAS)
Decanal	112-31-2	9	1	4	1033	
Diethylene glycol ethyl ether	111-90-0	9	2	4	922	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	190	30	4	913	DPGME
Dodecane (C 12)	112-40-3	5	0.7	4	1008	
2-Ethyl-1-hexanol	104-76-7	15	3	4	936	
Ethylene Glycol	107-21-1	91	35	4	715	
Isobutane	75-28-5	5	2	4	359	
Isoprene	78-79-5	6	2	4	497	
Limonene	138-86-3 or 5989-27-5	17	3	4	923	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
Menthol	89-78-1 or 1490-04-6	5	0.8	4	1028	
Methoxy-2-propanol	107-98-2	6	2	4	654	PGME

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Nonanal	124-19-6	5	0.8	4	983	
Pentane (C 5)	109-66-0	22	7	4	475	
Propylene glycol	57-55-6	16	5	4	747	
Tetradecane (C 14)	629-59-4	4	0.5	4	1097	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	17	2	4	1135	
Texanol-A	74367-33-2	130	15	4	1122	
Texanol-B	74367-34-3	170	19	4	1127	
Tridecane (C 13)	629-50-5	4	0.5	4	1054	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

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Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	26	14	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetone	67-64-1	46	19	400 - 11,745,000	sweet, fruity, etherous
Benzaldehyde	100-52-7	5	1	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.4	0.1	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	5	2	421 - 5,048,000	natural gas
1-Butanol	71-36-3	17	6	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	13	3	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	1.4	0.2	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
Chloroform	67-66-3	0.2	0.04	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.3	0.09	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	4.4	0.7	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	9	2	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	820	430	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	15	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	2.3	0.6	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.3	0.07	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	91	35	5,120 -	-
Hexane (C 6)	110-54-3	1.5	0.4	1,500 - 248,000	gasoline
Isoprene	78-79-5	6	2	47 - 3,590	aromatic
Isopropanol	67-63-0	45	18	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	17	3	2 - 310	lemon, plastic, citrus, rubber, terpeny
Menthol	89-78-1 or 1490-04-6	5	0.8	0 - 10,640	caraway, cool, minty, menthol, peppermint, sweet, woody
Methoxy-2-propanol	107-98-2	6	2	8,390 - 33,000	etherish, ammonia
4-Methyl-2-pentanone	108-10-1	1.1	0.3	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet

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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Methylene Chloride	75-09-2	0.9	0.3	1,200 - 440,000	sweet
Naphthalene	91-20-3	0.7	0.1	2 - 1,012	tar, creosote, mothballs, empyreumatic
Pentane (C 5)	109-66-0	22	7	1,290 - 1,147,000	sweet
Propylene glycol	57-55-6	16	5	5,140 -	-
Styrene	100-42-5	0.4	0.1	3 - 61,000	sharp, sweet
Toluene	108-88-3	3.6	1	21 - 157,000	sour, burnt
m,p-Xylene	108-38-3; 106-42-3	1	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.3	0.06	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.4	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	1.4	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.2	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	4.4	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.9	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Naphthalene	91-20-3	0.7	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide
Styrene	100-42-5	0.4	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Toluene	108-88-3	3.6	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	1	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of th uality indicators. It allows comparison of multiple samples with each other or with target l The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily to ppb using the following formula derived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as th $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, can be determined using the following formula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x

RTn – retention time of n-alkane eluting before target compound x
RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Ste 117 Jericho, NY 11753 US	**COC:** **Laboratory ID:**	**99670** **99670-8**
Sampled By:	James Harvey		
Project:	Marshall H.S.21111804		
Location:	805 S. Miami Ave. Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	03/31/2022 03/31/2022 03/31/2022 04/05/2022
Client Sample ID:	Rm 31		
Volume:	24 L		
Date Sampled:	03/30/2022		
Sample Type:	TDT AG386		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. Sample Summary: listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	4300	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	5	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	330	53	4	912	DPGME
Texanol-B	74367-34-3	270	30	4	1127	
Texanol-A	74367-33-2	220	24	4	1122	
Acetaldehyde	75-07-0	52	29	4	399	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	670	350	2.1	480	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**45**	**19**	1.0	509	
Acetonitrile	75-05-8	< 0.4	< 0.2	0.4	522	
Acrylonitrile	107-13-1	< 0.2	< 0.09	0.2	543	
Benzene	71-43-2	**0.3**	**0.1**	0.2	631	
Bromobenzene	108-86-1	< 0.2	< 0.03	0.2	866	
Bromochloromethane	74-97-5	< 0.2	< 0.04	0.2	603	
Bromodichloromethane	75-27-4	< 0.2	< 0.03	0.2	682	
Bromoform	75-25-2	< 0.2	< 0.02	0.2	837	
1,3-Butadiene	106-99-0	< 0.2	< 0.09	0.2	389	
tert-Butylbenzene	98-06-6	< 0.2	< 0.04	0.2	900	
sec-Butylbenzene	135-98-8	< 0.2	< 0.04	0.2	914	
n-Butylbenzene	104-51-8	< 0.2	< 0.04	0.2	949	
Carbon Disulfide	75-15-0	< 0.2	< 0.07	0.2	520	
Carbon Tetrachloride	56-23-5	**0.8**	**0.1**	0.2	623	
Chlorobenzene	108-90-7	< 0.2	< 0.04	0.2	791	
Chlorodibromomethane	124-48-1	< 0.2	< 0.02	0.2	759	
2-Chloroethanol	107-07-3	< 0.2	< 0.06	0.2	675	
Chloroform	67-66-3	< 0.2	< 0.04	0.2	608	
Chloroprene	126-99-8	< 0.2	< 0.06	0.2	571	
3-Chloropropene	107-05-1	< 0.2	< 0.07	0.2	527	
4-Chlorotoluene	106-43-4	< 0.2	< 0.04	0.2	883	
2-Chlorotoluene	95-49-8	< 0.2	< 0.04	0.2	877	
Cyclohexane	110-82-7	**0.2**	**0.07**	0.2	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.4	< 0.04	0.4	991	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.2	< 0.03	0.2	766	
Dibromomethane	74-95-3	< 0.2	< 0.03	0.2	674	
trans 1,4-Dichloro-2-butene	110-57-6	< 0.2	< 0.04	0.2	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.2	< 0.04	0.2	848	
1,2-Dichlorobenzene	95-50-1	< 0.2	< 0.03	0.2	951	
1,3-Dichlorobenzene	541-73-1	< 0.2	< 0.03	0.2	923	
1,4-Dichlorobenzene	106-46-7	**4.3**	**0.7**	0.2	930	
1,1-Dichloroethane	75-34-3	< 0.2	< 0.05	0.2	567	
1,2-Dichloroethane	107-06-2	< 0.2	< 0.05	0.2	633	
cis 1,2-Dichloroethene	156-59-2	< 0.2	< 0.05	0.2	593	
trans 1,2-Dichloroethene	156-60-5	< 0.2	< 0.05	0.2	548	
1,1-Dichloroethene	75-35-4	< 0.2	< 0.05	0.2	508	
2,2-Dichloropropane	594-20-7	< 0.2	< 0.04	0.2	593	
1,2-Dichloropropane	78-87-5	< 0.2	< 0.04	0.2	670	
1,3-Dichloropropane	142-28-9	< 0.2	< 0.04	0.2	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.2	< 0.05	0.2	729	
1,1-Dichloropropene	563-58-6	< 0.2	< 0.05	0.2	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.2	< 0.05	0.2	701	
Diethyl ether	60-29-7	< 0.2	< 0.07	0.2	493	
1,4-Dioxane	123-91-1	< 0.4	< 0.1	0.4	673	
Ethanol	64-17-5	**670**	**350**	2.1	480	J*
Ethylacetate	141-78-6	**1.9**	**0.5**	0.2	594	
Ethylbenzene	100-41-4	**0.3**	**0.08**	0.2	795	
Ethylmethacrylate	97-63-2	< 0.2	< 0.04	0.2	731	
4-Ethyltoluene	622-96-8	< 0.2	< 0.04	0.2	878	
Hexachlorobutadiene	87-68-3	< 0.2	< 0.02	0.2	1036	
Hexane (C 6)	110-54-3	**1.1**	**0.3**	0.2	562	
Isooctane	540-84-1	< 0.2	< 0.04	0.2	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**49**	**20**	1.0	517	
Isopropylbenzene	98-82-8	< 0.2	< 0.04	0.2	846	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.4**	**0.08**	0.2	924	
Methacrylonitrile	126-98-7	< 0.2	< 0.07	0.2	600	
Methyl methacrylate	80-62-6	< 0.2	< 0.06	0.2	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.2	< 0.06	0.2	547	MTBE
2-Methyl-1-propanol	78-83-1	**1.0**	**0.3**	0.2	625	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.3**	**0.3**	0.2	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.2	< 0.06	0.2	595	
Methylene Chloride	75-09-2	**0.6**	**0.2**	0.2	533	
2-Methylnaphthalene	91-57-6	< 0.4	< 0.07	0.4	1095	
Naphthalene	91-20-3	**0.5**	**0.09**	0.4	1042	
Nitrobenzene	98-95-3	< 0.8	< 0.2	0.8	999	
Pentachloroethane	76-01-7	< 0.2	< 0.03	0.2	902	
Propionitrile	107-12-0	< 0.2	< 0.09	0.2	593	
n-Propylbenzene	103-65-1	< 0.2	< 0.04	0.2	871	
Styrene	100-42-5	**0.4**	**0.1**	0.2	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.2	< 0.03	0.2	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.2	< 0.03	0.2	794	
Tetrachloroethene	127-18-4	< 0.2	< 0.03	0.2	746	
Tetrahydrofuran	109-99-9	< 0.2	< 0.07	0.2	604	
Toluene	108-88-3	**3.3**	**0.9**	0.2	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.07**	0.2	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.2	< 0.03	0.2	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.2	< 0.03	0.2	1052	
1,1,2-Trichloroethane	79-00-5	< 0.2	< 0.04	0.2	739	
1,1,1-Trichloroethane	71-55-6	< 0.2	< 0.04	0.2	616	
Trichloroethene	79-01-6	< 0.2	< 0.04	0.2	660	
1,2,3-Trichloropropane	96-18-4	< 0.2	< 0.03	0.2	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.2	< 0.04	0.2	881	
1,2,4-Trimethylbenzene	95-63-6	< 0.2	< 0.04	0.2	903	
m,p-Xylene	108-38-3; 106-42-3	**1.0**	**0.2**	0.4	802	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.3**	**0.07**	0.2	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	6	0.9	4	963	
Acetaldehyde	75-07-0	52	29	4	399	
Benzaldehyde	100-52-7	7	1	4	903	
Butane (C 4)	106-97-8	7	3	4	384	
1-Butanol	71-36-3	15	5	4	653	
2-Butoxyethanol	111-76-2	23	5	4	843	
Butoxyethoxyethanol	112-34-5	40	6	4	1029	
C12-C14 Hydrocarbon	N/A	6	N/A	4	1051	Contains silicon and oxygen; appears to be a siloxane
C7-C9 Hydrocarbon	N/A	8	N/A	4	755	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS); one is hexanal (CAS)
Decanal	112-31-2	14	2	4	1033	
Diethylene glycol ethyl ether	111-90-0	23	4	4	922	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	330	53	4	912	DPGME
Dodecane (C 12)	112-40-3	8	1	4	1008	
2-Ethyl-1-hexanol	104-76-7	18	3	4	936	
Ethylene Glycol	107-21-1	41	16	4	714	
Isobutane	75-28-5	5	2	4	358	
Limonene	138-86-3 or 5989-27-5	21	4	4	922	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
Methoxy-2-propanol	107-98-2	5	1	4	654	PGME
Nonanal	124-19-6	13	2	4	983	
Pentane (C 5)	109-66-0	22	7	4	475	
Propylene glycol	57-55-6	12	4	4	747	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Tetradecane (C 14)	629-59-4	5	0.7	4	1097	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	8	0.8	4	1135	
Texanol-A	74367-33-2	220	24	4	1122	
Texanol-B	74367-34-3	270	30	4	1127	
Tridecane (C 13)	629-50-5	6	0.8	4	1054	
Urea	57-13-6	8	3	4	989	L*

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

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Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	52	29	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetone	67-64-1	45	19	400 - 11,745,000	sweet, fruity, etherous
Benzaldehyde	100-52-7	7	1	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.3	0.1	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	7	3	421 - 5,048,000	natural gas
1-Butanol	71-36-3	15	5	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	23	5	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.8	0.1	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
Cyclohexane	110-82-7	0.2	0.07	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	4.3	0.7	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	23	4	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	670	350	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	18	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	1.9	0.5	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.3	0.08	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	41	16	5,120 -	-
Hexane (C 6)	110-54-3	1.1	0.3	1,500 - 248,000	gasoline
Isopropanol	67-63-0	49	20	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	21	4	2 - 310	lemon, plastic, citrus, rubber, terpeny
Methoxy-2-propanol	107-98-2	5	1	8,390 - 33,000	etherish, ammonia
2-Methyl-1-propanol	78-83-1	1.0	0.3	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex
4-Methyl-2-pentanone	108-10-1	1.3	0.3	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	0.6	0.2	1,200 - 440,000	sweet
Naphthalene	91-20-3	0.5	0.09	2 - 1,012	tar, creosote, mothballs, empyreumatic

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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Pentane (C 5)	109-66-0	22	7	1,290 - 1,147,000	sweet
Propylene glycol	57-55-6	12	4	5,140 -	-
Styrene	100-42-5	0.4	0.1	3 - 61,000	sharp, sweet
Toluene	108-88-3	3.3	0.9	21 - 157,000	sour, burnt
m,p-Xylene	108-38-3; 106-42-3	1.0	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.3	0.07	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.3	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.8	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
1,4-Dichlorobenzene	106-46-7	4.3	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.6	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Naphthalene	91-20-3	0.5	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide
Styrene	100-42-5	0.4	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Toluene	108-88-3	3.3	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	1.0	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of th uality indicators. It allows comparison of multiple samples with each other or with target l The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{[\frac{(A_s - A_b) \times W_s}{A_i}]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily to ppb using the following formula derived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as th $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, can be determined using the following formula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x

RTn – retention time of n-alkane eluting before target compound x
RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Ste 117 Jericho, NY 11753 US	**COC:** **Laboratory ID:**	**99670** **99670-9**
Sampled By:	James Harvey		
Project:	Marshall H.S.21111804		
Location:	805 S. Miami Ave. Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	03/31/2022 03/31/2022 03/31/2022 04/05/2022
Client Sample ID:	Rm 14		
Volume:	24 L		
Date Sampled:	03/30/2022		
Sample Type:	TDT AE162		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. Sample Summary: listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	5200	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	6	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Texanol-B	74367-34-3	390	44	4	1127	
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	300	49	4	912	DPGME
Texanol-A	74367-33-2	300	33	4	1122	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	970	500	2.1	480	J*
Isopropanol	67-63-0	100	41	1.0	517	

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**60**	**25**	1.0	509	
Acetonitrile	75-05-8	< 0.4	< 0.2	0.4	522	
Acrylonitrile	107-13-1	< 0.2	< 0.09	0.2	543	
Benzene	71-43-2	**0.4**	**0.1**	0.2	631	
Bromobenzene	108-86-1	< 0.2	< 0.03	0.2	866	
Bromochloromethane	74-97-5	< 0.2	< 0.04	0.2	603	
Bromodichloromethane	75-27-4	< 0.2	< 0.03	0.2	682	
Bromoform	75-25-2	< 0.2	< 0.02	0.2	837	
1,3-Butadiene	106-99-0	< 0.2	< 0.09	0.2	389	
tert-Butylbenzene	98-06-6	< 0.2	< 0.04	0.2	900	
sec-Butylbenzene	135-98-8	< 0.2	< 0.04	0.2	914	
n-Butylbenzene	104-51-8	< 0.2	< 0.04	0.2	949	
Carbon Disulfide	75-15-0	< 0.2	< 0.07	0.2	520	
Carbon Tetrachloride	56-23-5	**0.8**	**0.1**	0.2	623	
Chlorobenzene	108-90-7	< 0.2	< 0.04	0.2	791	
Chlorodibromomethane	124-48-1	< 0.2	< 0.02	0.2	759	
2-Chloroethanol	107-07-3	< 0.2	< 0.06	0.2	675	
Chloroform	67-66-3	**0.3**	**0.07**	0.2	608	
Chloroprene	126-99-8	< 0.2	< 0.06	0.2	571	
3-Chloropropene	107-05-1	< 0.2	< 0.07	0.2	527	
4-Chlorotoluene	106-43-4	< 0.2	< 0.04	0.2	883	
2-Chlorotoluene	95-49-8	< 0.2	< 0.04	0.2	877	
Cyclohexane	110-82-7	**0.3**	**0.07**	0.2	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.4	< 0.04	0.4	991	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.2	< 0.03	0.2	766	
Dibromomethane	74-95-3	< 0.2	< 0.03	0.2	674	
trans 1,4-Dichloro-2-butene	110-57-6	< 0.2	< 0.04	0.2	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.2	< 0.04	0.2	848	
1,2-Dichlorobenzene	95-50-1	< 0.2	< 0.03	0.2	951	
1,3-Dichlorobenzene	541-73-1	< 0.2	< 0.03	0.2	923	
1,4-Dichlorobenzene	106-46-7	**3.1**	**0.5**	0.2	930	
1,1-Dichloroethane	75-34-3	< 0.2	< 0.05	0.2	567	
1,2-Dichloroethane	107-06-2	< 0.2	< 0.05	0.2	633	
cis 1,2-Dichloroethene	156-59-2	< 0.2	< 0.05	0.2	593	
trans 1,2-Dichloroethene	156-60-5	< 0.2	< 0.05	0.2	548	
1,1-Dichloroethene	75-35-4	< 0.2	< 0.05	0.2	508	
2,2-Dichloropropane	594-20-7	< 0.2	< 0.04	0.2	593	
1,2-Dichloropropane	78-87-5	< 0.2	< 0.04	0.2	670	
1,3-Dichloropropane	142-28-9	< 0.2	< 0.04	0.2	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.2	< 0.05	0.2	729	
1,1-Dichloropropene	563-58-6	< 0.2	< 0.05	0.2	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.2	< 0.05	0.2	701	
Diethyl ether	60-29-7	< 0.2	< 0.07	0.2	493	
1,4-Dioxane	123-91-1	< 0.4	< 0.1	0.4	673	
Ethanol	64-17-5	**970**	**500**	2.1	480	J*
Ethylacetate	141-78-6	**2.3**	**0.6**	0.2	594	
Ethylbenzene	100-41-4	**0.4**	**0.08**	0.2	795	
Ethylmethacrylate	97-63-2	< 0.2	< 0.04	0.2	731	
4-Ethyltoluene	622-96-8	< 0.2	< 0.04	0.2	878	
Hexachlorobutadiene	87-68-3	< 0.2	< 0.02	0.2	1036	
Hexane (C 6)	110-54-3	**0.8**	**0.2**	0.2	562	
Isooctane	540-84-1	< 0.2	< 0.04	0.2	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**100**	**41**	1.0	517	
Isopropylbenzene	98-82-8	< 0.2	< 0.04	0.2	846	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.5**	**0.09**	0.2	924	
Methacrylonitrile	126-98-7	< 0.2	< 0.07	0.2	600	
Methyl methacrylate	80-62-6	< 0.2	< 0.06	0.2	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.2	< 0.06	0.2	547	MTBE
2-Methyl-1-propanol	78-83-1	**0.8**	**0.3**	0.2	625	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.9**	**0.5**	0.2	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.2	< 0.06	0.2	595	
Methylene Chloride	75-09-2	**0.5**	**0.1**	0.2	533	
2-Methylnaphthalene	91-57-6	< 0.4	< 0.07	0.4	1095	
Naphthalene	91-20-3	< 0.4	< 0.08	0.4	1042	
Nitrobenzene	98-95-3	< 0.8	< 0.2	0.8	999	
Pentachloroethane	76-01-7	< 0.2	< 0.03	0.2	902	
Propionitrile	107-12-0	< 0.2	< 0.09	0.2	593	
n-Propylbenzene	103-65-1	< 0.2	< 0.04	0.2	871	
Styrene	100-42-5	**0.5**	**0.1**	0.2	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.2	< 0.03	0.2	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.2	< 0.03	0.2	794	
Tetrachloroethene	127-18-4	< 0.2	< 0.03	0.2	746	
Tetrahydrofuran	109-99-9	< 0.2	< 0.07	0.2	604	
Toluene	108-88-3	**3.3**	**0.9**	0.2	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.6**	**0.07**	0.2	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.2	< 0.03	0.2	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.2	< 0.03	0.2	1052	
1,1,2-Trichloroethane	79-00-5	< 0.2	< 0.04	0.2	739	
1,1,1-Trichloroethane	71-55-6	< 0.2	< 0.04	0.2	616	
Trichloroethene	79-01-6	< 0.2	< 0.04	0.2	660	
1,2,3-Trichloropropane	96-18-4	< 0.2	< 0.03	0.2	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.2	< 0.04	0.2	881	
1,2,4-Trimethylbenzene	95-63-6	< 0.2	< 0.04	0.2	903	
m,p-Xylene	108-38-3; 106-42-3	**1**	**0.2**	0.4	802	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.3**	**0.08**	0.2	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	7	1	4	963	
Acetaldehyde	75-07-0	22	12	4	399	
Benzaldehyde	100-52-7	6	1	4	903	
Butane (C 4)	106-97-8	7	3	4	384	
1-Butanol	71-36-3	26	8	4	653	
2-Butoxyethanol	111-76-2	24	5	4	843	
Butoxyethoxyethanol	112-34-5	34	5	4	1029	
4-tert-Butylcyclohexyl acetate	32210-23-4	5	0.6	4	1078	
C12-C14 Hydrocarbon	N/A	9	N/A	4	1050	Contains silicon and oxygen; appears to be a siloxane
C7-C9 Hydrocarbon	N/A	8	N/A	4	755	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS); one is hexanal (CAS)
Decanal	112-31-2	7	1	4	1032	
Diethylene glycol ethyl ether	111-90-0	21	4	4	922	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	300	49	4	912	DPGME
Dodecane (C 12)	112-40-3	7	1	4	1008	
2-Ethyl-1-hexanol	104-76-7	18	3	4	936	
Ethylene Glycol	107-21-1	56	22	4	714	
Isobutane	75-28-5	6	3	4	359	
Isohexadecane	4390-04-9	7	0.7	4	1077	
Isoprene	78-79-5	9	3	4	497	
Limonene	138-86-3 or 5989-27-5	42	7	4	922	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
Methoxy-2-propanol	107-98-2	10	3	4	654	PGME

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
2-Methylbutane	78-78-4	5	2	4	447	
Octamethylcyclotetrasiloxane (D4)	556-67-2	5	0.4	4	858	
Pentane (C 5)	109-66-0	29	10	4	475	
n-Propylacetate	109-60-4	15	3	4	674	
Propylene glycol	57-55-6	14	4	4	746	
Tetradecane (C 14)	629-59-4	5	0.7	4	1097	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	20	2	4	1135	
Texanol-A	74367-33-2	300	33	4	1122	
Texanol-B	74367-34-3	390	44	4	1127	
Tridecane (C 13)	629-50-5	5	0.7	4	1053	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

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Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	22	12	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetone	67-64-1	60	25	400 - 11,745,000	sweet, fruity, etherous
Benzaldehyde	100-52-7	6	1	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.4	0.1	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	7	3	421 - 5,048,000	natural gas
1-Butanol	71-36-3	26	8	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	24	5	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.8	0.1	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
Chloroform	67-66-3	0.3	0.07	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.3	0.07	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	3.1	0.5	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	21	4	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	970	500	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	18	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	2.3	0.6	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.4	0.08	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	56	22	5,120 -	-
Hexane (C 6)	110-54-3	0.8	0.2	1,500 - 248,000	gasoline
Isoprene	78-79-5	9	3	47 - 3,590	aromatic
Isopropanol	67-63-0	100	41	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	42	7	2 - 310	lemon, plastic, citrus, rubber, terpeny
Methoxy-2-propanol	107-98-2	10	3	8,390 - 33,000	etherish, ammonia
2-Methyl-1-propanol	78-83-1	0.8	0.3	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex
4-Methyl-2-pentanone	108-10-1	1.9	0.5	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet

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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Methylene Chloride	75-09-2	0.5	0.1	1,200 - 440,000	sweet
Pentane (C 5)	109-66-0	29	10	1,290 - 1,147,000	sweet
n-Propylacetate	109-60-4	15	3	48 - 87,000	sweet, ester
Propylene glycol	57-55-6	14	4	5,140 -	-
Styrene	100-42-5	0.5	0.1	3 - 61,000	sharp, sweet
Toluene	108-88-3	3.3	0.9	21 - 157,000	sour, burnt
m,p-Xylene	108-38-3; 106-42-3	1	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.3	0.08	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.4	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.8	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.3	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	3.1	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.4	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.5	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Styrene	100-42-5	0.5	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Toluene	108-88-3	3.3	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	1	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of th uality indicators. It allows comparison of multiple samples with each other or with target l The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily to ppb using the following formula derived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as th $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, can be determined using the following formula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x

RTn – retention time of n-alkane eluting before target compound x
RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Ste 117 Jericho, NY 11753 US	**COC:** **Laboratory ID:**	**99670** **99670-10**
Sampled By:	James Harvey		
Project:	Marshall H.S.21111804		
Location:	805 S. Miami Ave. Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	03/31/2022 03/31/2022 03/31/2022 04/05/2022
Client Sample ID:	Hall O/S Little Theater		
Volume:	24 L		
Date Sampled:	03/30/2022		
Sample Type:	TDT AL069		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. Sample Summary: listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	1100	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	5	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Butane (C 4)	106-97-8	29	12	4	383	
Texanol-B	74367-34-3	19	2	4	1127	
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	15	2	4	912	DPGME

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	260	140	2.1	480	J*
Acetone	67-64-1	19	8.0	1.0	509	

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**19**	**8.0**	1.0	509	
Acetonitrile	75-05-8	< 0.4	< 0.2	0.4	522	
Acrylonitrile	107-13-1	< 0.2	< 0.09	0.2	543	
Benzene	71-43-2	**0.4**	**0.1**	0.2	631	
Bromobenzene	108-86-1	< 0.2	< 0.03	0.2	866	
Bromochloromethane	74-97-5	< 0.2	< 0.04	0.2	603	
Bromodichloromethane	75-27-4	< 0.2	< 0.03	0.2	682	
Bromoform	75-25-2	< 0.2	< 0.02	0.2	837	
1,3-Butadiene	106-99-0	< 0.2	< 0.09	0.2	389	
tert-Butylbenzene	98-06-6	< 0.2	< 0.04	0.2	900	
sec-Butylbenzene	135-98-8	< 0.2	< 0.04	0.2	914	
n-Butylbenzene	104-51-8	< 0.2	< 0.04	0.2	949	
Carbon Disulfide	75-15-0	< 0.2	< 0.07	0.2	520	
Carbon Tetrachloride	56-23-5	**0.5**	**0.08**	0.2	623	
Chlorobenzene	108-90-7	< 0.2	< 0.04	0.2	791	
Chlorodibromomethane	124-48-1	< 0.2	< 0.02	0.2	759	
2-Chloroethanol	107-07-3	< 0.2	< 0.06	0.2	675	
Chloroform	67-66-3	< 0.2	< 0.04	0.2	608	
Chloroprene	126-99-8	< 0.2	< 0.06	0.2	571	
3-Chloropropene	107-05-1	< 0.2	< 0.07	0.2	527	
4-Chlorotoluene	106-43-4	< 0.2	< 0.04	0.2	883	
2-Chlorotoluene	95-49-8	< 0.2	< 0.04	0.2	877	
Cyclohexane	110-82-7	**0.2**	**0.07**	0.2	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.4	< 0.04	0.4	991	

Client Sample ID: Hall O/S Little Theater
Laboratory ID: 99670-10

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.2	< 0.03	0.2	766	
Dibromomethane	74-95-3	< 0.2	< 0.03	0.2	674	
trans 1,4-Dichloro-2-butene	110-57-6	< 0.2	< 0.04	0.2	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.2	< 0.04	0.2	848	
1,2-Dichlorobenzene	95-50-1	< 0.2	< 0.03	0.2	951	
1,3-Dichlorobenzene	541-73-1	< 0.2	< 0.03	0.2	923	
1,4-Dichlorobenzene	106-46-7	**0.5**	**0.08**	0.2	930	
1,1-Dichloroethane	75-34-3	< 0.2	< 0.05	0.2	567	
1,2-Dichloroethane	107-06-2	< 0.2	< 0.05	0.2	633	
cis 1,2-Dichloroethene	156-59-2	< 0.2	< 0.05	0.2	593	
trans 1,2-Dichloroethene	156-60-5	< 0.2	< 0.05	0.2	548	
1,1-Dichloroethene	75-35-4	< 0.2	< 0.05	0.2	508	
2,2-Dichloropropane	594-20-7	< 0.2	< 0.04	0.2	593	
1,2-Dichloropropane	78-87-5	< 0.2	< 0.04	0.2	670	
1,3-Dichloropropane	142-28-9	< 0.2	< 0.04	0.2	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.2	< 0.05	0.2	729	
1,1-Dichloropropene	563-58-6	< 0.2	< 0.05	0.2	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.2	< 0.05	0.2	701	
Diethyl ether	60-29-7	< 0.2	< 0.07	0.2	493	
1,4-Dioxane	123-91-1	< 0.4	< 0.1	0.4	673	
Ethanol	64-17-5	**260**	**140**	2.1	480	J*
Ethylacetate	141-78-6	**0.8**	**0.2**	0.2	594	
Ethylbenzene	100-41-4	**0.3**	**0.06**	0.2	795	
Ethylmethacrylate	97-63-2	< 0.2	< 0.04	0.2	731	
4-Ethyltoluene	622-96-8	< 0.2	< 0.04	0.2	878	
Hexachlorobutadiene	87-68-3	< 0.2	< 0.02	0.2	1036	
Hexane (C 6)	110-54-3	**0.5**	**0.1**	0.2	562	
Isooctane	540-84-1	< 0.2	< 0.04	0.2	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**11**	**4.2**	1.0	517	
Isopropylbenzene	98-82-8	< 0.2	< 0.04	0.2	846	

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Laboratory ID: 99670-10

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.3**	**0.05**	0.2	924	
Methacrylonitrile	126-98-7	< 0.2	< 0.07	0.2	600	
Methyl methacrylate	80-62-6	< 0.2	< 0.06	0.2	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.2	< 0.06	0.2	547	MTBE
2-Methyl-1-propanol	78-83-1	**0.8**	**0.3**	0.2	625	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.0**	**0.2**	0.2	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.2	< 0.06	0.2	595	
Methylene Chloride	75-09-2	**0.3**	**0.09**	0.2	533	
2-Methylnaphthalene	91-57-6	< 0.4	< 0.07	0.4	1095	
Naphthalene	91-20-3	< 0.4	< 0.08	0.4	1042	
Nitrobenzene	98-95-3	< 0.8	< 0.2	0.8	999	
Pentachloroethane	76-01-7	< 0.2	< 0.03	0.2	902	
Propionitrile	107-12-0	< 0.2	< 0.09	0.2	593	
n-Propylbenzene	103-65-1	< 0.2	< 0.04	0.2	871	
Styrene	100-42-5	< 0.2	< 0.05	0.2	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.2	< 0.03	0.2	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.2	< 0.03	0.2	794	
Tetrachloroethene	127-18-4	< 0.2	< 0.03	0.2	746	
Tetrahydrofuran	109-99-9	< 0.2	< 0.07	0.2	604	
Toluene	108-88-3	**1.3**	**0.3**	0.2	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.6**	**0.08**	0.2	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.2	< 0.03	0.2	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.2	< 0.03	0.2	1052	
1,1,2-Trichloroethane	79-00-5	< 0.2	< 0.04	0.2	739	
1,1,1-Trichloroethane	71-55-6	< 0.2	< 0.04	0.2	616	
Trichloroethene	79-01-6	< 0.2	< 0.04	0.2	660	
1,2,3-Trichloropropane	96-18-4	< 0.2	< 0.03	0.2	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.2	< 0.04	0.2	881	
1,2,4-Trimethylbenzene	95-63-6	**0.2**	**0.05**	0.2	903	
m,p-Xylene	108-38-3; 106-42-3	**0.8**	**0.2**	0.4	802	

Client Sample ID: Hall O/S Little Theater
Laboratory ID: 99670-10

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.3**	**0.06**	0.2	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Butane (C 4)	106-97-8	29	12	4	383	
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	15	2	4	912	DPGME
Isobutane	75-28-5	9	4	4	358	
Limonene	138-86-3 or 5989-27-5	8	2	4	923	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
2-Methylbutane	78-78-4	4	1	4	447	
Pentane (C 5)	109-66-0	8	3	4	474	
Texanol-A	74367-33-2	9	1	4	1122	
Texanol-B	74367-34-3	19	2	4	1127	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Enthalpy Analytical, LLC (MTP)
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetone	67-64-1	19	8.0	400 - 11,745,000	sweet, fruity, etherous
Benzene	71-43-2	0.4	0.1	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	29	12	421 - 5,048,000	natural gas
Carbon Tetrachloride	56-23-5	0.5	0.08	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
Cyclohexane	110-82-7	0.2	0.07	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	0.5	0.08	121 - 15,000	camphor, mothballs
Ethanol	64-17-5	260	140	90 - 40,334,000	vinous, alcohol
Ethylacetate	141-78-6	0.8	0.2	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.3	0.06	2 - 18,000	oily, solvent
Hexane (C 6)	110-54-3	0.5	0.1	1,500 - 248,000	gasoline
Isopropanol	67-63-0	11	4.2	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	8	2	2 - 310	lemon, plastic, citrus, rubber, terpeny
2-Methyl-1-propanol	78-83-1	0.8	0.3	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex
4-Methyl-2-pentanone	108-10-1	1.0	0.2	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	0.3	0.09	1,200 - 440,000	sweet
Pentane (C 5)	109-66-0	8	3	1,290 - 1,147,000	sweet
Toluene	108-88-3	1.3	0.3	21 - 157,000	sour, burnt
1,2,4-Trimethylbenzene	95-63-6	0.2	0.05	6 - 2,400	aromatic
m,p-Xylene	108-38-3; 106-42-3	0.8	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.3	0.06	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.4	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.5	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
1,4-Dichlorobenzene	106-46-7	0.5	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.3	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Toluene	108-88-3	1.3	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	0.8	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of th uality indicators. It allows comparison of multiple samples with each other or with target l The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily to ppb using the following formula derived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as th $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, can be determined using the following formula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x

RTn – retention time of n-alkane eluting before target compound x
RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

APPENDIX G

COMBUSTION BYPRODUCT AIR SAMPLES LABORATORY REPORT AND CHAINS OF CUSTODY

EAA Project # : (Lab use only) **22-0744**

ENVIRONMENTAL ANALYSIS ASSOCIATES, INC. - CHAIN OF CUSTODY FORM

Contact Information

Company Name : J.S. HELD, LLC
Address : 7100 Northland Circle N. STE 307
City/State/Zip : Brooklyn Park, MN 55428
Phone # : 917-841-8875
Email : ~~jharvey~~ jharvey@jsheld.com
Date Collected : 3.30.22
Date Submitted : 3.30.22
Contact Name : J. HARVEY

Project Information

Client Project # : 21111804
Project Description : MARSHALL Public H.S.

EAA-Invoice to: [X] Same [ ] Different - Provide below
Email Invoice to:

Special Instructions: E-MAIL Results
jharvey@jsheld.com
wzoeller@jsheld.com

Analysis requested

Check appropriate boxes or describe if the analysis is different

[ ] *Photo Report*

Mold
- [ ] Airborne mold (Quantitative)
- [ ] Surface mold (Qualitative)
- [ ] Surface mold (Quantitative)
- [ ] Bulk mold (Qualitative)

Dust Characterization
- [ ] Airborne dust
- [ ] Surface dust
- [ ] Forensic bulk dust

Combustion By-Products
- [X] Airborne fire residue (Quantitative)
- [ ] Surface fire residue (area % & cts/mm^2) (Fire Type: Wildfire - Structure Fire - Protein Fire)
- [ ] pH analysis
- [ ] pH & Conductivity analysis
- [ ] pH, Conductivity & Cation / Anion
- [ ] Automated SEM/EDAX Analysis - Elemental Composition

Asbestos
- [ ] Bulk asbestos - PLM - EPA/600/R-93/116

Bacteria
- [ ] Total coliform w/E. coli (presence, absence)

Scanning Electron Microscopy
- [ ] Automated Dust Analysis - Screening
- [ ] Automated Dust Analysis - Quantitative
- [ ] Qualitative Bulk
- [ ] Other:_____

Analysis Turnaround Times (TAT)
- [X] Standard (2-5 Days) (3)
- [ ] Next Day (24hrs)
- [ ] Same Day (8hrs)
- [ ] Weekend/Afterhours*

** Must notify EAA in advance - Limit on number of rush samples that may be completed in a given day. Turnaround Time (TAT) is measured in full business days; for example, samples arriving today for 24hr TAT are due at the next business day, excludes weekends and holidays.*

EAA# lab use only	Sample #	Description / Location	Analysis (if different from above)	Vol. (liters)
1	A-1	Rm 7		75L
2	A-2	Rm 10		
3	A-3	Rm 3		
4	A-4	Rm 4		
5	A-5	LIBRARY		
6	A-6	Rm 26		
7	A-7	SE HALL B/W Rms 36 + 37		
8	A-8	Rm 31		
9	A-9	Rm 14		
10	A-10	HALL o/s Little Theatre		

ENVIRONMENTAL ANALYSIS ASSOCIATES, INC. Shipping Location Information

(All samples should be sent to Michigan unless otherwise discussed)

Michigan Lab [X] Attn: Joseph Heintskill
306 5th Street, Suite 2A
(989) 895-4447 Bay City, MI 48708

California Lab [ ] Attn: Daniel Baxter
Please call before sending
(858) 272-7747 Forensic & Research Only

Relinquished / Received (Signature)	Printed Name	Company	Date	Time
	JAMES HARVEY	J.S. Held	3.30.22	1700
	Samantha Richards	EAA	3/31/22	1000

CONTRACT TERMS

By providing signature authorization, the client acknowledges this contract is entered into, and the lab work will be performed in either San Diego, California or Bay City, Michigan. This signature binds the submitting company to provide payment for services according to EAA's fee schedule within 30 days above from receipt of the project invoice. A 1% finance charge per month will be charged on overdue invoices. Sample archive policy: EAA retains and holds samples for a time period of 3 weeks only. If samples need to be retained by the laboratory for a longer period of time, you must make arrangements for retention at the time of sample submission. Additional charges may apply.

AIRBORNE FIRE/COMBUSTION PARTICLE AND DUST ANALYSIS

EAA Method : Fire/Dust-A01

Client Name : J.S. Held, LLC
Client Project # : 21111804 Project description : Marshall Public H.S.
Requested by : J. Harvey Date collected : 3/30/22 Sample condition : *Acceptable as received*
EAA Project# : 22-0744 Sample received : 3/31/22

Client Sample#	Sample Description / Location	Fire / Combustion Particle Comments
A-1	Rm 7	Fire/combustion particles not detected
A-2	Rm 10	Fire/combustion particles not detected
A-3	Rm 3	Fire/combustion particles not detected
A-4	Rm 4	Fire/combustion particles not detected
A-5	Library	Fire/combustion particles not detected

AIRBORNE FIRE / COMBUSTION PARTICLE CONCENTRATIONS (Cts./m^3) - Slit Impaction Sample Analysis *Magnification : 500X*

Particle Category / Sample # ►	A-1	A-2	A-3	A-4	A-5
Total Fire/Combustion Particles ►	**not detected**	**not detected**	**not detected**	**not detected**	**not detected**
Soot					
Char - vegetative					
Char - non-vegetative					
Ash					
(Fire indicator particles)					
Inorganic Particles (Cts/m^3)					
Cellulosic / synthetic fibers	**823**	**731**	**823**	**869**	**320**
Fiberglass fibers	**69**	**27**		**27**	
Mineral / clay soil dust	**24900**	**20000**	**18900**	**16200**	**16400**
Unidentified opaque	**6490**	**5300**	**5120**	**4020**	**3110**
Bioaerosols (Cts/m^3)					
Mold spores - unspecified	**229**	**274**	**229**	**274**	**91**
Mixed Pollen					
Plant fragments					**46**
Skin cell fragments	**7680**	**7950**	**10500**	**4940**	**3660**
Micellaneous / other					
Statistical Parameters					
Vol. analyzed (m3) - 500x :	0.022	0.022	0.022	0.022	0.022
Detect limit(Cts/m^3) :	45.7	45.7	45.7	45.7	45.7
% sample analyzed :	29%	29%	29%	29%	29%
Sample flow rate (lpm):	15.0	15.0	15.0	15.0	15.0
Sample trace length (mm):	14.40	14.40	14.40	14.40	14.40
Microscope field diameter (mm):	0.420	0.420	0.420	0.420	0.420

Note: Sample results are only applicable to the items tested and locations as received. Sample descriptions and volumetric data are provided by the client.

*The color-coded comparison ranges for **Typical-Low**, **Typical**, **Atypical**, and **Elevated** fire / combustion particles concentrations are based on the estimated 50th percentile frequency of occurrence, a 3-fold (3X), and a 10-fold (10X) increase above the 50th percentile measured in non-suspect fire impacted buildings. These ranges are only intended to be used as a preliminary comparison with levels measured on your project. Laboratory test results are support information to be used in conjunction with observations gathered during the visual site assessment. The local background, additional control samples, site specific building conditions, and other potential fire-related combustion sources should be considered when rendering an independent opinion and conclusion as to whether or not the concentrations measured by the EAA laboratory on your project represent a typical background or elevated condition.*

Statistical Classification Range	Percentile Frequency of Occurrence	Fire/combustion particle Range (cts/m^3)
Elevated >10x background	**> 95%**	**> 1000**
Atypical >3x background	**> 75%**	**> 300**
Typical - upper background	**> 50%**	**> 100**
Typical-low - background	**< 50%**	**< 100**

Authorized / data reviewed by: *Jackie L. Sova*
Analyst : *err*

Report date: **4/4/22**
Date analyzed: 4/1/22

ENVIRONMENTAL ANALYSIS ASSOCIATES, INC. - 306 5th Street, Suite 2A - Bay City, MI 48708

AIRBORNE FIRE/COMBUSTION PARTICLE AND DUST ANALYSIS

EAA Method : Fire/Dust-A01

Client Name : J.S. Held, LLC
Client Project # : 21111804 — Project description : Marshall Public H.S.
Requested by : J. Harvey — Date collected : 3/30/22 — Sample condition : *Acceptable as received*
EAA Project# : 22-0744 — Sample received : 3/31/22

Client Sample#	Sample Description / Location	Fire / Combustion Particle Comments
A-6	Rm 26	Fire/combustion particles not detected
A-7	SE Hall B/w Rms 36 + 37	Fire/combustion particles not detected
A-8	Rm 31	Fire/combustion particles not detected
A-9	Rm 14	Fire/combustion particles not detected
A-10	Hall o/s Little Theatre	Fire/combustion particles not detected

AIRBORNE FIRE / COMBUSTION PARTICLE CONCENTRATIONS (Cts./m^3) - Slit Impaction Sample Analysis *Magnification : 500X*

Particle Category — Sample # ►	A-6	A-7	A-8	A-9	A-10
Total Fire/Combustion Particles ►	**not detected**	**not detected**	**not detected**	**not detected**	**not detected**
Soot					
Char - vegetative					
Char - non-vegetative					
Ash					
(Fire indicator particles)					
Inorganic Particles (Cts/m^3)					
Cellulosic / synthetic fibers	**640**	**594**	**183**	**777**	**229**
Fiberglass fibers	**14**	**27**			
Mineral / clay soil dust	**38000**	**29700**	**18800**	**25300**	**12400**
Unidentified opaque	**5300**	**2470**	**1280**	**3930**	**1830**
Bioaerosols (Cts/m^3)					
Mold spores - unspecified		**46**	**46**	**274**	**137**
Mixed Pollen	**46**				**46**
Plant fragments	**91**	**46**			
Skin cell fragments	**14800**	**6580**	**2930**	**8780**	**4300**
Micellaneous / other					
Statistical Parameters					
Vol. analyzed (m3) - 500x :	0.022	0.022	0.022	0.022	0.022
Detect limit(Cts/m^3) :	45.7	45.7	45.7	45.7	45.7
% sample analyzed :	29%	29%	29%	29%	29%
Sample flow rate (lpm):	15.0	15.0	15.0	15.0	15.0
Sample trace length (mm):	14.40	14.40	14.40	14.40	14.40
Microscope field diameter (mm):	0.420	0.420	0.420	0.420	0.420

Note: Sample results are only applicable to the items tested and locations as received. Sample descriptions and volumetric data are provided by the client.

*The color-coded comparison ranges for **Typical-Low**, **Typical**, **Atypical**, and **Elevated** fire / combustion particles concentrations are based on the estimated 50th percentile frequency of occurrence, a 3-fold (3X), and a 10-fold (10X) increase above the 50th percentile measured in non-suspect fire impacted buildings. These ranges are only intended to be used as a preliminary comparison with levels measured on your project. Laboratory test results are support information to be used in conjunction with observations gathered during the visual site assessment. The local background, additional control samples, site specific building conditions, and other potential fire-related combustion sources should be considered when rendering an independent opinion and conclusion as to whether or not the concentrations measured by the EAA laboratory on your project represent a typical background or elevated condition.*

Statistical Classification Range	Percentile Frequency of Occurrence	Fire/combustion particle Range (cts/m^3)
Elevated >10x background	**> 95%**	**> 1000**
Atypical >3x background	**> 75%**	**> 300**
Typical - upper background	**> 50%**	**> 100**
Typical-low - background	**< 50%**	**< 100**

Authorized / data reviewed by: *Jackie L. Sova*
Analyst : *err*

Report date: **4/4/22**
Date analyzed: 4/1/22

APPENDIX H

COMBUSTION BYPRODUCT SURFACE SAMPLES LABORATORY REPORT AND CHAINS OF CUSTODY

EAA Project # : (Lab use only) 22-0744

ENVIRONMENTAL ANALYSIS ASSOCIATES, INC. - CHAIN OF CUSTODY FORM

Contact Information

Company Name : J.S. HELD, LLC
Address : 7100 Northland Circle N. STE 307
City/State/Zip : Brooklyn Park, MN 55428
Phone # : 917-841-8875
Email : jharvey@jsheld.com
Date Collected : 3.30.22
Date Submitted : 3.30.22
Contact Name : J. Harvey

Project Information

Client Project # : Z1111804
Project Description : Marshall Public H.S.

EAA-Invoice to: [X] Same [ ] Different - Provide below
Email Invoice to:

Special Instructions: E-MAIL Results
jharvey@jsheld.com
WZOELLER@jsheld.com

Analysis requested

Check appropriate boxes or describe if the analysis is different

[ ] Photo Report

Mold
- [ ] Airborne mold (Quantitative)
- [ ] Surface mold (Qualitative)
- [ ] Surface mold (Quantitative)
- [ ] Bulk mold (Qualitative)

Dust Characterization
- [ ] Airborne dust
- [ ] Surface dust
- [ ] Forensic bulk dust

Combustion By-Products
- [ ] Airborne fire residue (Quantitative)
- [X] Surface fire residue (area % & cts/mm^2)
  (Fire Type: Wildfire - Structure Fire - Protein Fire)
- [ ] pH analysis
- [ ] pH & Conductivity analysis
- [ ] pH, Conductivity & Cation / Anion
- [ ] Automated SEM/EDAX Analysis - Elemental Composition

Asbestos
- [ ] Bulk asbestos - PLM - EPA/600/R-93/116

Bacteria
- [ ] Total coliform w/E. coli (presence, absence)

Scanning Electron Microscopy
- [ ] Automated Dust Analysis - Screening
- [ ] Automated Dust Analysis - Quantitative
- [ ] Qualitative Bulk
- [ ] Other:

Analysis Turnaround Times (TAT)
- [ ] Standard (2-5 Days)
- [ ] Next Day (24hrs)
- [ ] Same Day (8hrs)
- [ ] Weekend/Afterhours*

** Must notify EAA in advance - Limit on number of rush samples that may be completed in a given day. Turnaround Time (TAT) is measured in full business days; for example, samples arriving today for 24hr TAT are due at the next business day, excludes weekends and holidays.*

EAA# lab use only	Sample #	Description / Location	Analysis (if different from above)	Vol. (liters)
11	B-1	Rm 7 - Carpet		
12	B-2	Rm 10 - Carpet		
13	B-3	Rm 26 - Carpet		
14	B-4	Rm 31 - Carpet		
15	B-5	Library Carpet		
16	B-6	Asst. Principal Office - Carpet		
17	B-7	Rm 38 - Carpet. - Per J. Harvey email 4/5		
18	B-8	Rm 7 - Contents in ServPro Box		
19	B-9	Rm 7 - Contents in ServPro Box		
20	B-10	Rm 10 - Contents in ServPro Box		

ENVIRONMENTAL ANALYSIS ASSOCIATES, INC. Shipping Location Information

(All samples should be sent to Michigan unless otherwise discussed)

Michigan Lab [X] Attn: Joseph Heintskill
306 5th Street, Suite 2A
(989) 895-4447 Bay City, MI 48708

California Lab [ ] Attn: Daniel Baxter
Please call before sending
(858) 272-7747 Forensic & Research Only

Relinquished / Received (Signature)	Printed Name	Company	Date	Time
	James Harvey	J.S. HELD, LLC	3.30.22	1700
	Samantha Richards	EAA	3/31/22	1000

CONTRACT TERMS

By providing signature authorization, the client acknowledges this contract is entered into, and the lab work will be performed in either San Diego, California or Bay City, Michigan. This signature binds the submitting company to provide payment for services according to EAA's fee schedule within 30 days above from receipt of the project invoice. A 1% finance charge per month will be charged on overdue invoices. Sample archive policy: EAA retains and holds samples for a time period of 3 weeks only. If samples need to be retained by the laboratory for a longer period of time, you must make arrangements for retention at the time of sample submission. Additional charges may apply.

EAA Project # : (Lab use only) **22-0744**

ENVIRONMENTAL ANALYSIS ASSOCIATES, INC. - CHAIN OF CUSTODY FORM

Sample archive policy: EAA retains and holds samples for a time period of 3 weeks only. If samples need to be retained by the laboratory for a longer period of time, you must make arrangements for retention at the time of sample submission. Additional charges may apply.

EAA# lab use only	Sample #	Description / Location	Analysis (if different from above)	Vol. (liters)
21	B-11	Rm 4 - Contents in Servpro Box		
22	B-12	Rm 4 - Contents in Servpro Box		
23	B-13	Rm 4 - Contents in Servpro Box		
24	B-14	Rm 17 - Contents in Servpro Box.		
25	B-15	Rm 26 - Contents in Servpro Box		
26	B-16	Rm 31 - Top of Cabinet		
27	B-17	Hallway contents in Servpro Box		
28	B-18	Mrs. Simms Rm - Contents in Servpro Box		
29	B-19	Rm 12 - Contents in Servpro Box		
30	B-20	Rm 8 - Top of File Cabinet		

Relinquished / received (Signature)	Printed Name	Company	Date	Time
	James Harvey	J.S. Held, LLC	3.30.22	1700
	Samantha Richards	EAA	3/31/22	1000

ENVIRONMENTAL ANALYSIS ASSOCIATES, INC.

306 5th Street, Suite 2A - Bay City, MI 48708

LABORATORY REPORT

Fire/Combustion Particle Analysis - Surface & Airborne Dust

Report prepared for : J.S. Held, LLC

Client Project # : 21111804
Project Description : Marshall Public H.S.
EAA Project # : 22-0744

Samples Collected : 03/30/22
Samples Received : 03/31/22
Date of Analysis : 04/01/22

Authorized / data reviewed by : *Jackie L. Sova*

Jackie L. Sova
Senior Laboratory Analyst

Fire/Combustion Particle Data Summary Table

Client : J.S. Held, LLC
Client Project # : 21111804
Client Project Description : Marshall Public H.S.
EAA Project # : 22-0744

		Fire / Combustion Particle Concentration						Qualitative Observations		
		Estimated Area Ratio %					* Total Surface Density (Cts/mm^2)	Are large fire combustion particles detected ?	Are wildfire or structure fire indicator particles present?	Are there any potential interferences present?
Sample #	Sample Description	Total Area %	Soot	Char	Ash	Indicator Particles				
B-1	Rm 7 - Carpet	not detected	not detected	not detected	not detected		not detected			
B-2	Rm 10 - Carpet	not detected	not detected	not detected	not detected		not detected			
B-3	Rm 26 - Carpet	not detected	not detected	not detected	not detected		not detected			
B-4	Rm 31 - Carpet	not detected	not detected	not detected	not detected		not detected			
B-5	Library Carpet	0.1	0.1	not detected	not detected		0.7			
B-6	Asst. Principal Office - Carpet	0.2	0.2	not detected	not detected		1.4			
B-7	Rm 38 - Carpet	0.2	0.2	not detected	not detected		1.4			
B-8	Rm 7 - Contents in Servpro Box	0.6	0.2	0.4	not detected		8.6			
B-9	Rm 7 - Contents in Servpro Box	not detected	not detected	not detected	not detected		not detected			
B-10	Rm 10 - Contents in Servpro Box	not detected	not detected	not detected	not detected		not detected			
B-11	Rm 4 - Contents in Servpro Box	not detected	not detected	not detected	not detected		not detected			
B-12	Rm 4 - Contents in Servpro Box	not detected	not detected	not detected	not detected		not detected			

The Estimated Area Ratio % is the estimated area (µm2) of the fire / combustion particles divided by all other particle categories analyzed in the sample.

The Surface density (Cts/mm2) of fire / combustion particles is the numerical surface particle concentration independent of the amount or ratio of background dust present.

** Note: If the surface particle density of fire residue particles (cts/mm2) is not displayed in the report, it was not reported due to significant sample overloading, or could not be performed on the collection media submitted for analysis. The surface density of fire combustion particles can only be calculated on tape lift samples that are not over-loaded with dust.*

The color-coded ranges provided in this summary table are to be used as a preliminary comparison with levels measured from your project. The detailed one-page reports should be used as the primary basis for interpreting the EAA data. The color-coded guideline ranges of Typical-Low, Typical, Atypical, or Elevated are based on historical background data collected on tape-lift samples from other buildings not suspected of a fire / combustion particle impact. Laboratory test results are secondary support information to be used in conjunction with information gathered during the visual site assessment. The local background, site specific building conditions, and other potential fire / combustion sources must be considered in order to render an independent opinion and conclusion as to whether or not the concentrations measured on your samples by the EAA laboratory represent a typical background, atypical, or elevated condition for your specific project.

Total Area Ratio % & Numerical Surface Concentrations		
Classification Range	Fire particles Area Ratio %	Fire particles Density cts/mm^2
Elevated > 10x background	>10%	>50
Atypical 3 -10x background	3-10%	5-50
Typical - upper background	1-3%	1-5
Typical - low	<1%	<1

Fire/Combustion Particle Data Summary Table

Client : J.S. Held, LLC
Client Project # : 21111804
Client Project Description : Marshall Public H.S.
EAA Project # : 22-0744

		Fire / Combustion Particle Concentration						Qualitative Observations		
		Estimated Area Ratio %								
Sample #	Sample Description	Total Area %	Soot	Char	Ash	Indicator Particles	* Total Surface Density (Cts/mm^2)	Are large fire combustion particles detected ?	Are wildfire or structure fire indicator particles present?	Are there any potential interferences present?
B-13	Rm 4 - Contents in Servpro Box	not detected	not detected	not detected	not detected		not detected			
B-14	Rm 17 - Contents in Servpro Box	1.4	not detected	1.4	not detected		0.7			
B-15	Rm 26 - Contents in Servpro Box	0.8	not detected	0.8	not detected		0.7			
B-16	Rm 31 - Top of Cabinet	not detected	not detected	not detected	not detected		not detected			
B-17	Hallway contents in Servpro Box	not detected	not detected	not detected	not detected		not detected			
B-18	Mrs. Simms Rm - Contents in Servpro Box	not detected	not detected	not detected	not detected		not detected			
B-19	Rm 12 - Contents in Servpro Box	not detected	not detected	not detected	not detected		not detected			
B-20	Rm 8 - Top of File Cabinet	not detected	not detected	not detected	not detected		not detected			

The Estimated Area Ratio % is the estimated area (µm2) of the fire / combustion particles divided by all other particle categories analyzed in the sample.

The Surface density (Cts/mm2) of fire / combustion particles is the numerical surface particle concentration independent of the amount or ratio of background dust present.

** Note: If the surface particle density of fire residue particles (cts/mm2) is not displayed in the report, it was not reported due to significant sample overloading, or could not be performed on the collection media submitted for analysis. The surface density of fire combustion particles can only be calculated on tape lift samples that are not over-loaded with dust.*

The color-coded ranges provided in this summary table are to be used as a preliminary comparison with levels measured from your project. The detailed one-page reports should be used as the primary basis for interpreting the EAA data. The color-coded guideline ranges of Typical-Low, Typical, Atypical, or Elevated are based on historical background data collected on tape-lift samples from other buildings not suspected of a fire / combustion particle impact. Laboratory test results are secondary support information to be used in conjunction with information gathered during the visual site assessment. The local background, site specific building conditions, and other potential fire / combustion sources must be considered in order to render an independent opinion and conclusion as to whether or not the concentrations measured on your samples by the EAA laboratory represent a typical background, atypical, or elevated condition for your specific project.

Total Area Ratio % & Numerical Surface Concentrations		
Classification Range	Fire particles Area Ratio %	Fire particles Density cts/mm^2
Elevated > 10x background	>10%	>50
Atypical 3 -10x background	3-10%	5-50
Typical - upper background	1-3%	1-5
Typical - low	<1%	<1

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804 — EAA Project # : 22-0744
Requested by : J. Harvey — EAA Sample # : 0744-11
Project Description : Marshall Public H.S.
Client Sample # : B-1
Client sample description : Rm 7 - Carpet
Sample collected : 3/30/22 — Analysis magnification : 500x
Sample received : 3/31/22 — Fields counted : 10
Sample media : Tape — Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)

Sample description - color / texture :	Gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	0.7	12.9
	Fiberglass fibers	0.7	2.1
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	51.9	34.8
	Opaque / mixed paint and/or metal corrosion	24.5	36.5
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	0.7	2.1
Animal fragments :	Dander / skin cells	4.3	11.6
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 115 — Background dust loading : Typical - low
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22* — Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804 — EAA Project # : 22-0744
Requested by : J. Harvey — EAA Sample # : 0744-12
Project Description : Marshall Public H.S.
Client Sample # : B-2
Client sample description : Rm 10 - Carpet
Sample collected : 3/30/22 — Analysis magnification : 500x
Sample received : 3/31/22 — Fields counted : 10
Sample media : Tape — Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	0.7	12.5
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	73.5	31.8
	Opaque / mixed paint and/or metal corrosion	23.1	33.3
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	8.6	22.5
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 147 — Background dust loading : Typical - low
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22* — Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804
Requested by : J. Harvey
Project Description : Marshall Public H.S.
Client Sample # : B-3
Client sample description : Rm 26 - Carpet
Sample collected : 3/30/22
Sample received : 3/31/22
Sample media : Tape

EAA Project # : 22-0744
EAA Sample # : 0744-13
Analysis magnification : 500x
Fields counted : 10
Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Gray powdery & fibrous dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	4.3	46.2
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	53.3	21.4
	Opaque / mixed paint and/or metal corrosion	18.7	16.7
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	0.7	0.8
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	9.4	15.0
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 120
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Background dust loading : Typical

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22*

Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804
Requested by : J. Harvey
Project Description : Marshall Public H.S.
Client Sample # : B-4
Client sample description : Rm 31 - Carpet
Sample collected : 3/30/22
Sample received : 3/31/22
Sample media : Tape

EAA Project # : 22-0744
EAA Sample # : 0744-14
Analysis magnification : 500x
Fields counted : 10
Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	4.3	42.6
	Fiberglass fibers	0.7	1.2
Non-fibrous Constituents :	Mixed inorganic mineral dust and starch grains	86.5	32.0
	Opaque / mixed paint and/or metal corrosion	23.1	18.9
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	3.6	5.3
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 164
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Background dust loading : Typical

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22*

Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804 — EAA Project # : 22-0744
Requested by : J. Harvey — EAA Sample # : 0744-15
Project Description : Marshall Public H.S.
Client Sample # : B-5
Client sample description : Library Carpet
Sample collected : 3/30/22 — Analysis magnification : 500x
Sample received : 3/31/22 — Fields counted : 10
Sample media : Tape — Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Low fire/combustion residue present (isolated particles detected)

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

		Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	FIRE / COMBUSTION RESIDUE CONSTITUENTS	**Totals ►** **0.7**	**0.1 %**
	Aciniform soot	0.7	0.1
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	1.4	16.6
	Fiberglass fibers	0.7	1.4
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	37.5	10.8
	Opaque / mixed paint and/or metal corrosion	66.3	63.5
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	1.4	0.3
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	4.3	7.5
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 156 — Background dust loading : Typical
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22* — Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

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FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804 — EAA Project # : 22-0744
Requested by : J. Harvey — EAA Sample # : 0744-16
Project Description : Marshall Public H.S.
Client Sample # : B-6
Client sample description : Asst. Principal Office - Carpet
Sample collected : 3/30/22 — Analysis magnification : 500x
Sample received : 3/31/22 — Fields counted : 10
Sample media : Tape — Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Low fire/combustion residue present (isolated particles detected)

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

		Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	FIRE / COMBUSTION RESIDUE CONSTITUENTS	**Totals ►** **1.4**	**0.2 %**
	Aciniform soot	1.4	0.2
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	1.4	25.3
	Fiberglass fibers	0.7	2.1
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	93.0	40.9
	Opaque / mixed paint and/or metal corrosion	13.7	20.1
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	4.3	11.4
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 159 — Background dust loading : Typical - low
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22* — Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

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FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804 — EAA Project # : 22-0744
Requested by : J. Harvey — EAA Sample # : 0744-17
Project Description : Marshall Public H.S.
Client Sample # : B-7
Client sample description : Rm 38 - Carpet
Sample collected : 3/30/22 — Analysis magnification : 500x
Sample received : 3/31/22 — Fields counted : 10
Sample media : Tape — Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Low fire/combustion residue present (isolated particles detected)

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**1.4**	**0.2 %**
	Aciniform soot	1.4	0.2
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	2.9	40.0
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	53.3	18.5
	Opaque / mixed paint and/or metal corrosion	26.7	30.8
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	5.0	10.5
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 124 — Background dust loading : Typical - low
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22* — Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

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FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804 — EAA Project # : 22-0744
Requested by : J. Harvey — EAA Sample # : 0744-18
Project Description : Marshall Public H.S.
Client Sample # : B-8
Client sample description : Rm 7 - Contents in Servpro Box
Sample collected : 3/30/22 — Analysis magnification : 500x
Sample received : 3/31/22 — Fields counted : 5
Sample media : Tape — Field area (mm^2) : 0.139
Area counted (mm^2) : 0.69

SUMMARY CONCLUSIONS : Low fire/combustion residue present (isolated particles detected)

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Brown / gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**8.6**	**0.6 %**
	Aciniform soot	7.2	0.2
	Char (mixed pyrolyzed vegetation / non-vegetation)	1.4	0.4
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	2.9	5.7
	Fiberglass fibers	8.6	2.8
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	373.4	27.5
	Opaque / mixed paint and/or metal corrosion	279.7	45.8
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	59.1	17.4
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 508 — Background dust loading : Atypical
Detection Limit - (Area ratio %) : 0.6%
Detection Limit - (Cts/area) mm2 : 1.4

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22* — Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

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FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804 — EAA Project # : 22-0744
Requested by : J. Harvey — EAA Sample # : 0744-19
Project Description : Marshall Public H.S.
Client Sample # : B-9
Client sample description : Rm 7 - Contents in Servpro Box
Sample collected : 3/30/22 — Analysis magnification : 500x
Sample received : 3/31/22 — Fields counted : 15
Sample media : Tape — Field area (mm^2) : 0.139
Area counted (mm^2) : 2.08

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)

Sample description - color / texture :	Low visible dust detected
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	not detected	not detected
	Fiberglass fibers	1.0	6.5
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	18.7	18.9
	Opaque / mixed paint and/or metal corrosion	5.8	19.4
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	9.1	55.3
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 72 — Background dust loading : Typical - low
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.5

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22* — Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

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FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804
Requested by : J. Harvey
Project Description : Marshall Public H.S.
Client Sample # : B-10
Client sample description : Rm 10 - Contents in Servpro Box
Sample collected : 3/30/22
Sample received : 3/31/22
Sample media : Tape

EAA Project # : 22-0744
EAA Sample # : 0744-20
Analysis magnification : 500x
Fields counted : 15
Field area (mm^2) : 0.139
Area counted (mm^2) : 2.08

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Low visible dust detected
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	0.5	29.3
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	12.5	19.0
	Opaque / mixed paint and/or metal corrosion	1.9	12.2
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	4.3	39.5
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 40
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.5

Background dust loading : Typical - low

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22*

Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

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FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804 — EAA Project # : 22-0744
Requested by : J. Harvey — EAA Sample # : 0744-21
Project Description : Marshall Public H.S.
Client Sample # : B-11
Client sample description : Rm 4 - Contents in Servpro Box
Sample collected : 3/30/22 — Analysis magnification : 500x
Sample received : 3/31/22 — Fields counted : 10
Sample media : Tape — Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)

Sample description - color / texture :	Gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	2.2	32.6
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	36.8	13.8
	Opaque / mixed paint and/or metal corrosion	18.7	23.5
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	2.9	0.7
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	13.0	29.3
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 102 — Background dust loading : Typical - low
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22* — Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804 — EAA Project # : 22-0744
Requested by : J. Harvey — EAA Sample # : 0744-22
Project Description : Marshall Public H.S.
Client Sample # : B-12
Client sample description : Rm 4 - Contents in Servpro Box
Sample collected : 3/30/22 — Analysis magnification : 500x
Sample received : 3/31/22 — Fields counted : 15
Sample media : Tape — Field area (mm^2) : 0.139
Area counted (mm^2) : 2.08

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Low visible dust detected
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	1.4	55.9
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	8.6	8.4
	Opaque / mixed paint and/or metal corrosion	2.4	7.8
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	4.8	28.0
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 36 — Background dust loading : Typical - low
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.5

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/05/22* — Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804 — EAA Project # : 22-0744
Requested by : J. Harvey — EAA Sample # : 0744-23
Project Description : Marshall Public H.S.
Client Sample # : B-13
Client sample description : Rm 4 - Contents in Servpro Box
Sample collected : 3/30/22 — Analysis magnification : 500x
Sample received : 3/31/22 — Fields counted : 10
Sample media : Tape — Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)

Sample description - color / texture :	Gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	1.4	35.3
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	43.2	39.7
	Opaque / mixed paint and/or metal corrosion	5.8	11.8
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	3.6	13.2
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 75 — Background dust loading : Typical - low
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/04/22* — Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804
Requested by : J. Harvey
Project Description : Marshall Public H.S.
Client Sample # : B-14
Client sample description : Rm 17 - Contents in Servpro Box
Sample collected : 3/30/22
Sample received : 3/31/22
Sample media : Tape

EAA Project # : 22-0744
EAA Sample # : 0744-24
Analysis magnification : 500x
Fields counted : 10
Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Fire/combustion residue measured in the typical / upper background range

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**0.7**	**1.4 %**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	0.7	1.4
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	1.4	18.6
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	49.0	23.7
	Opaque / mixed paint and/or metal corrosion	22.3	24.0
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	0.7	1.6
Animal fragments :	Dander / skin cells	15.9	30.7
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 125
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Background dust loading : Typical - low

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/04/22*

Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804
Requested by : J. Harvey
Project Description : Marshall Public H.S.
Client Sample # : B-15
Client sample description : Rm 26 - Contents in Servpro Box
Sample collected : 3/30/22
Sample received : 3/31/22
Sample media : Tape

EAA Project # : 22-0744
EAA Sample # : 0744-25
Analysis magnification : 500x
Fields counted : 10
Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Low fire/combustion residue present (isolated particles detected)

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**0.7**	**0.8 %**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	0.7	0.8
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	5.8	43.9
	Fiberglass fibers	0.7	1.8
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	59.1	11.3
	Opaque / mixed paint and/or metal corrosion	15.9	10.1
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	0.7	0.1
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	27.4	31.3
Miscellaneous :	Insect leg and body parts	0.7	0.7
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 154
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7
Background dust loading : Typical

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/04/22*
Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

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FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804
Requested by : J. Harvey
Project Description : Marshall Public H.S.
Client Sample # : B-16
Client sample description : Rm 31 - Top of Cabinet
Sample collected : 3/30/22
Sample received : 3/31/22
Sample media : Tape

EAA Project # : 22-0744
EAA Sample # : 0744-26
Analysis magnification : 500x
Fields counted : 10
Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Low visible dust detected
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	0.7	16.9
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	33.2	19.5
	Opaque / mixed paint and/or metal corrosion	10.1	19.8
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	1.4	0.6
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	12.3	43.2
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 80
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Background dust loading : Typical - low

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/04/22*

Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804
Requested by : J. Harvey
Project Description : Marshall Public H.S.
Client Sample # : B-17
Client sample description : Hallway contents in Servpro Box
Sample collected : 3/30/22
Sample received : 3/31/22
Sample media : Tape

EAA Project # : 22-0744
EAA Sample # : 0744-27
Analysis magnification : 500x
Fields counted : 5
Field area (mm^2) : 0.139
Area counted (mm^2) : 0.69

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Brown / gray fibrous dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	44.7	77.4
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	149.9	6.5
	Opaque / mixed paint and/or metal corrosion	90.8	13.1
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	11.5	3.0
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 206
Detection Limit - (Area ratio %) : 0.5%
Detection Limit - (Cts/area) mm2 : 1.4

Background dust loading : Atypical

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/04/22*

Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804 — EAA Project # : 22-0744
Requested by : J. Harvey — EAA Sample # : 0744-28
Project Description : Marshall Public H.S.
Client Sample # : B-18
Client sample description : Mrs. Simms Rm - Contents in Servpro Box
Sample collected : 3/30/22 — Analysis magnification : 500x
Sample received : 3/31/22 — Fields counted : 10
Sample media : Tape — Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Gray powdery & fibrous dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	11.5	82.0
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	24.5	4.4
	Opaque / mixed paint and/or metal corrosion	10.1	7.5
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	5.8	6.2
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 72 — Background dust loading : Typical
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/04/22* — Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804
Requested by : J. Harvey
Project Description : Marshall Public H.S.
Client Sample # : B-19
Client sample description : Rm 12 - Contents in Servpro Box
Sample collected : 3/30/22
Sample received : 3/31/22
Sample media : Tape

EAA Project # : 22-0744
EAA Sample # : 0744-29
Analysis magnification : 500x
Fields counted : 15
Field area (mm^2) : 0.139
Area counted (mm^2) : 2.08

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Low visible dust detected
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	1.4	64.7
	Fiberglass fibers	not detected	not detected
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	6.7	7.6
	Opaque / mixed paint and/or metal corrosion	0.5	1.8
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	not detected	not detected
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	3.8	25.9
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 26
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.5

Background dust loading : Typical - low

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/04/22*

Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

FIRE/COMBUSTION RESIDUE & DUST ANALYSIS - Optical Microscopy Method: FIRE-D02

Client Name : J.S. Held, LLC
Client Project # : 21111804
Requested by : J. Harvey
Project Description : Marshall Public H.S.
Client Sample # : B-20
Client sample description : Rm 8 - Top of File Cabinet
Sample collected : 3/30/22
Sample received : 3/31/22
Sample media : Tape

EAA Project # : 22-0744
EAA Sample # : 0744-30
Analysis magnification : 500x
Fields counted : 10
Field area (mm^2) : 0.139
Area counted (mm^2) : 1.39

SUMMARY CONCLUSIONS : Fire/combustion residue not detected

QUALITATIVE / ASSEMBLAGE OBSERVATIONS -Reflected & Polarized Light Microscopy (10-500x)	
Sample description - color / texture :	Gray powdery dust
Smoke or fire odor present :	No
Large char (>500µm) / aciniform soot clusters (>50µm) present :	No
Large ash particles present :	No
Wildfire or structure fire indicator/signature particles present :	No

	FIRE / COMBUSTION RESIDUE CONSTITUENTS	Particle Concentration Cts/area (mm2)	Estimated Area Ratio %
	Totals ►	**not detected**	**not detected**
	Aciniform soot	not detected	not detected
	Char (mixed pyrolyzed vegetation / non-vegetation)	not detected	not detected
	Ash	not detected	not detected
	INORGANIC CONSTITUENTS		
Fibrous Constituents :	Cellulosic / synthetic fabric fibers	2.2	32.8
	Fiberglass fibers	0.7	1.8
Non-fibrous Constituents :	Mixed inorganic mineral dust / soil	50.5	19.1
	Opaque / mixed paint and/or metal corrosion	19.5	24.6
	BIOAEROSOLS		
Mold Spores / Structures :	Unspecified	1.4	0.4
Pollen :	Unspecified	not detected	not detected
Plant fragments :	Vegetation fragments, trichomes, etc.	not detected	not detected
Animal fragments :	Dander / skin cells	9.4	21.3
Miscellaneous :	Unspecified	not detected	not detected
	OTHER CONSTITUENTS		
Biogenic / organic debris :	Unspecified	not detected	not detected

Particles counted : 116
Detection Limit - (Area ratio %) : 1.0%
Detection Limit - (Cts/area) mm2 : 0.7

Background dust loading : Typical - low

Analysis date : *4/1/22*

Authorized / data reviewed by : *Jackie L. Sova* *04/04/22*

Analyst initials : *err*

Background dust loading (area%) : Typical-low <5%, Typical 5-20%, Atypical 20-40%, Elevated 40-80%, Overloaded >80%

The local geographic background and other site specific conditions and combustion sources must be taken into account in order to determine if an atypical or elevated condition is present. The estimated surface particle concentrations per unit surface area (Cts/mm2) can only be calculated on tape lift samples. For a detailed explanation, see the EAA "Suggested Report Interpretation Guidelines" located on our website at eaalab.com.

Note: Sample results are only applicable to the items or locations tested.

APPENDIX I

SURFACE MOLD LABORATORY REPORT AND CHAINS OF CUSTODY

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Report for:

James Harvey
J.S. Held LLC
Attn: James Harvey
7100 Northland Circle North, Suite 307
Brooklyn Park, MN 55428

Regarding: Project: JSH #21111804; Marshall Public High School
EML ID: 2888811

Approved by:

Operations Manager
Joshua Cox

Dates of Analysis:
Quantitative spore count direct exam: 04-04-2022

Service SOPs: Quantitative spore count direct exam (EM-MY-S-1041)
AIHA-LAP, LLC accredited service, Lab ID #102297

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. Due to the nature of the analyses performed, field blank correction of results is not applied. The results relate only to the samples as received and tested.

Eurofins EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

Eurofins EMLab P&K's LabServe® reporting system includes automated fail-safes to ensure that all AIHA-LAP, LLC quality requirements are met and notifications are added to reports when any quality steps remain pending.

Eurofins EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: J.S. Held LLC
C/O: James Harvey
Re: JSH #21111804; Marshall Public High School

Date of Sampling: 03-30-2022
Date of Receipt: 03-31-2022
Date of Report: 04-04-2022

QUANTITATIVE SPORE COUNT REPORT

Location:	C-1: Rm 7-Carpet				C-2: Rm10-Carpet				C-3: Rm 26-Carpet				C-4: Rm 31 -Carpet			
Comments (see below)	None				A				None				None			
Sample type	Tape sample				Tape sample				Tape sample				Tape sample			
Lab ID-Version‡:	13860131-1				13860132-1				13860133-1				13860134-1			
Analysis Date:	04/04/2022				04/04/2022				04/04/2022				04/04/2022			
Background debris (1-4+)	1+				1+				1+				2+			
Sample size	0.155 in2				0.155 in2				0.155 in2				0.155 in2			
Reporting unit	1 in2				1 in2				1 in2				1 in2			
Dilution	1:1				1:1				1:1				1:1			
	Count	Count/sample	Count/unit	%	Count	Count/sample	Count/unit	%	Count	Count/sample	Count/unit	%	Count	Count/sample	Count/unit	%
Hyphal fragments	2	2	13	n/a		< 1	< 7	n/a		< 1	< 7	n/a	1	1	7	n/a
§ TOTAL FUNGAL SPORES	2	2	13	100		< 1	< 7	100	2	2	13	100	1	1	7	100
Bipolaris/Drechslera group																
Cladosporium	2	2	13	100					1	1	7	50	1	1	7	100
Curvularia																
Epicoccum																
Fusarium																
Myrothecium																
Nigrospora																
Other brown																
Other colorless																
Penicillium/Aspergillus types																
Pithomyces									1	1	7	50				
Rusts																
Smuts, Periconia, Myxomycetes																
Stachybotrys																
Stemphylium																
Torula																
Ulocladium																
Zygomycetes																

Comments: A) No spores detected.

‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".
§ Total Fungal Spores has been rounded to two significant figures to reflect analytical precision.
Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample, indicating a raw count of <1 spore.

The limit of detection is 1 spore per area analyzed; Analytical Sensitivity is 1 spore per unit times the dilution factor.

Eurofins EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: J.S. Held LLC
C/O: James Harvey
Re: JSH #21111804; Marshall Public High School

Date of Sampling: 03-30-2022
Date of Receipt: 03-31-2022
Date of Report: 04-04-2022

QUANTITATIVE SPORE COUNT REPORT

Location:	C-5: Library Carpet				C-6: Asst. Principal Office Carpet				C-7: Rm 38-Carpet			
Comments (see below)	A				None				None			
Sample type	Tape sample				Tape sample				Tape sample			
Lab ID-Version‡:	13860135-1				13860136-1				13860137-1			
Analysis Date:	04/04/2022				04/04/2022				04/04/2022			
Background debris (1-4+)	1+				2+				2+			
Sample size	0.155 in2				0.155 in2				0.155 in2			
Reporting unit	1 in2				1 in2				1 in2			
Dilution	1:1				1:1				1:1			
	Count	Count/sample	Count/unit	%	Count	Count/sample	Count/unit	%	Count	Count/sample	Count/unit	%
Hyphal fragments		< 1	< 7	n/a	1	1	7	n/a		< 1	< 7	n/a
§ TOTAL FUNGAL SPORES		< 1	< 7	100	3	3	19	100	1	1	7	100
Bipolaris/Drechslera group									1	1	7	100
Cladosporium					2	2	13	67				
Curvularia												
Epicoccum												
Fusarium												
Myrothecium												
Nigrospora												
Other brown					1	1	7	33				
Other colorless												
Penicillium/Aspergillus types												
Pithomyces												
Rusts												
Smuts, Periconia, Myxomycetes												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Zygomycetes												

Comments: A) No spores detected.

‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".
§ Total Fungal Spores has been rounded to two significant figures to reflect analytical precision.
Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample, indicating a raw count of <1 spore.

The limit of detection is 1 spore per area analyzed; Analytical Sensitivity is 1 spore per unit times the dilution factor.

This cover letter and accompanying pages are an integral part of this report. All analyses are performed in our AIHA-LAP, LLC accredited laboratory. The data generated in this report are based on the samples and accompanying information provided and represent concentrations at a point in time under the conditions sampled. Results can vary with site conditions. EMLab P&K employees did not collect samples for this project, and may provide only limited interpretation of this data as it relates to the overall investigation.

Quality Assurance

EMLab P&K is staffed with highly trained professionals, including PhD's, chemists, and registered microbiologists with over 40 years of experience. The reliability of test results depends on many factors such as the personnel performing the tests, environmental conditions, selection and validation of test methods, equipment functioning, measurement traceability, as well as the sampling, storage and handling of test items, all of which are a reflection of the laboratories overall quality system.

EMLab P&K has modeled its quality system after ISO 17025, General Requirements for the Competence of Testing and Calibration Laboratories, one of the most stringent sets of standards in the industry, to ensure that its customers receive the high standard of accuracy, reliability, and impartiality that they have come to expect from a leader in the environmental industry. EMLab P&K's adherence to the standards set forth in ISO 17025 has been validated and formally recognized through accreditations granted by an independent outside agency, American Industrial Hygiene Association Laboratory Accreditation Program, LLC (AIHA-LAP, LLC). As an additional measure to demonstrate its competency to perform the analyses it offers to its competency to perform the analyses it offers to its clients, EMLab P&K also participates in a variety of different proficiency testing programs, including the Environmental Microbiology Proficiency Analytical Testing Program (EMPAT) sponsored by the American Industrial Hygiene Association Proficiency Analytical Testing Programs.

As part of its continuous commitment to excellence, EMLab P&K is also inspected, licensed and/or accredited by a number of governmental agencies and independent associations in addition to those already mentioned above. The scope document, accreditation certificates, and proficiency results can all be accessed at www.emlab.com. Below you will find additional information regarding the specific analyses requested for this project.

Comments

The comments identify issues or events that are relevant to your analytical results. A comment includes information about the validity, the source of the data whether calculated, entered or estimated, and the value of an observation. In each case the comments provide significant information vital to the interpretation of the laboratory data.

For additional information, or if you have any questions regarding this report, please do not hesitate to call.

Analytical References

Medically Important Fungi: A Guide to Identification, 3rd ed., ASM, 1995.
Standard Methods for the Examination of Water and Wastewater, 19th ed., APHA, 1995.
Sampling and Identifying Allergenic Pollens and Molds, Blewstone, 1990.
Identifying Filamentous Fungi: A Clinical Laboratory Handbook, Star, 1996.
Manual of Clinical Microbiology, 7th ed., ASM, 1999.
A Laboratory Guide to Common *Aspergillus* Species and their Teleomorphs, CSIRO, 1994.
Bioaerosols: Assessment and Control, ACGIH, 1999.

CHAIN OF CUSTODY

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www.EMLabPK.com

Marlton, NJ: 3000 Lincoln Dr E, Ste. A, Marlton, NJ 08053 * **(866) 871-1984**
Phoenix, AZ: 1501 West Knudsen Drive, Phoenix, AZ 85027 * **(800) 651-4802**
SSF, CA: 6000 Shoreline Ct, Ste. 205, S. San Francisco, CA 94080 * **(866) 888-6653**

WEATHER	Fog	Rain	Snow	Wind	Clear
None					
Light		✓			
Moderate					
Heavy					

002888811

CONTACT INFORMATION

Company:	J.S. HELD, LLC	Address:	7100 Northland Circle North STE 307 Brooklyn PARK, MN 55428
Contact:	J. HARVEY	Special Instructions:	E-MAIL Results: jharvey@jsheld.com wzoeller@jsheld.com
Phone:	917-841-8875		

PROJECT INFORMATION

Project ID:	JSH # 21111804		
Project Description:	MARSHALL Public High School		
Project Zip Code:	65340	Sampling Date/Time:	3.30.22
PO Number:		Sampled By:	J. HARVEY

TURN AROUND TIME CODES - (TAT)

STD - Standard (Default)
ND - Next Business Day
SD - Same Business Day
WH - Weekend/Holiday/ASAP

Rushes received after 2pm or on weekends, will be considered received the next business day. Please alert us in advance of weekend analysis needs.

REQUESTED SERVICES

SAMPLE ID	DESCRIPTION	Sample Type (Below)	TAT (Above)	Total Volume/Area (as applicable)	NOTES (Time of day, Temp, RH, etc.)	Spore Trap	Spore Trap Analysis	Other biological particles - supplement	Direct Microscopic Exam (Qualitative)	Quantitative spore count direct exam	Dust Characterization	1-Media Surface Fungi (Genus ID + Asp. spp.)	Culturable Air Fungi (Genus ID + Asp. spp.)	Culturable Air and Surfa	Gram Stain and Counts (Culturable Air and Surfa	*Legionella* culture	Total Coliform, *E.coli* (Presence/Absence)	QuantiTray-Sewage Screen	OTHER: (please specify test)	Asbestos in Air - PCM Airborne Fiber Count (NIOSH 7400)	Asbestos Bulk - PLM	Lead (Pb) - Flame AA	PCR (please specify test)	Allergens (please specify test)
C-1	Rm 7 - CARPET	~~T~~	STD	-	-					✓														
C-2	Rm 10 - CARPET	T	STD	-	-					✓														
C-3	Rm 26 - CARPET	T	STD	-	-					✓														
C-4	Rm 31 - CARPET	T	STD	-	-					✓														
C-5	Library CARPET	T	STD	-	-					✓														
C-6	Asst. Principal Office CARPET	T	STD	-	-					✓														
C-7	Rm 38 - CARPET	T	STD	-	-					✓														

SAMPLE TYPE CODES

BC - BioCassette™	**CP** - Contact Plate	**T** - Tape	**O** - Other:
A1S - Andersen	**ST** - Spore Trap	**SW** - Swab	
SAS - Surface Air Sampler	**B** - Bulk	**SO** - Soil	
NP - Non-potable Water	**P** - Potable Water	**D** - Dust	

RELINQUISHED BY	DATE & TIME	RECEIVED BY	DATE & TIME
	3.30.22/1700		3-31-22 10AM

TABLES

TABLE 1.

COMPARISON OF RESULTS TO NEW YORK DEPARTMENT OF HEALTH SURVEY, ACGIH THRESHOLD LIMIT VALUES AND OSHA PERMISSIBLE EXPOSURE LIMITS

Table 1. Comparison of Results to New York State Department of Health Survey, ACGIH Threshold Limit Values (TLV) and OSHA Permissible Exposure Limits (PEL)													
Compound	**Room 7 (ng/L)**	**Room 10 (ng/L)**	**Room 3 (ng/L)**	**Room 4 (ng/L)**	**Library (ng/L)**	**Room 26 (ng/L)**	**SE Hallway between Rooms 36 & 37 (ng/L)**	**Room 31 (ng/L)**	**Room 14 (ng/L)**	**Hall Outside of Little Theater (ng/L)**	**NYS DOH Upper Fence Limit (ng/L)**	**ACGIH Threshold Limit Value (ng/L)**	**OSHA PEL (ng/L)**
TO-17 Compounds													
Acetone	61.0	62.0	49.0	48.0	< 1.0	49.0	46.0	45.0	60.0	19.0	115.0	590,000	2,400,000
Acetonitrile	0.5	0.6	< 0.4	0.6	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	NE	34,000	70,000
Benzene	0.4	0.4	0.4	0.4	< 0.2	0.4	0.4	0.3	0.4	0.4	13.0	1,600	3,190
Carbon Tetrachloride	0.7	0.7	0.7	0.7	< 0.2	0.9	1.4	0.8	0.8	0.5	1.3	31,500	63,000
Chloroform	0.3	0.3	0.2	0.2	< 0.3	0.2	0.2	< 0.2	0.3	< 0.2	1.2	48,900	NE
Cyclohexane	0.3	0.3	0.3	0.3	< 0.2	0.2	0.3	0.2	0.3	0.2	6.3	345,000	1,050,000
1,4-Dichlorobenzene	2.9	3.1	2.5	2.3	< 0.2	3.5	4.4	4.3	3.1	0.5	1.2	60,000	450,000
Ethanol	1,500	1,400	790	1,100	9	720	820	670	970	260	1,300	NE	1,900,000
Ethylacetate	4.6	3.4	2.3	4.8	< 0.2	2	2.3	1.9	2.3	0.8	NE	1,400,000	1,400,000
Ethylbenzene	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	6.4	90,000	435,000
Hexane (C 6)	0.8	0.8	0.8	0.8	< 0.2	0.8	1.5	1.1	0.8	0.5	NE	180,000	1,800,000
Isopropanol	150.0	120.0	130.0	110.0	< 1.0	44.0	45.0	49.0	100.00	11.00	NE	492,000	980,000
p-Isopropyltoluene	0.5	0.6	0.4	0.4	< 0.2	0.5	0.3	0.4	0.5	0.3	NE	NE	NE
2-Methyl-1-propanol	< 0.2	< 0.2	0.9	0.8	< 0.2	< 0.2	< 0.2	1.0	0.8	0.8	NE	150,000	300,000
4-Methyl-2-pentanone	1.6	2.2	1.3	1.3	< 0.2	2.9	1.1	1.3	1.9	1.0	1.9	82,000	410,000
Methylene Chloride	0.5	0.4	0.5	0.5	< 0.2	0.6	0.9	0.6	0.5	0.3	16.0	174,000	87,000
Naphthalene	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.4	0.7	0.5	< 0.4	< 0.4	NE	52,000	50,000
Styrene	0.5	0.5	0.5	0.6	< 0.2	0.4	0.4	0.4	0.5	< 0.2	1.4	86,000	425,000
Toluene	3.4	3.3	3.1	3.6	< 0.2	3.1	3.6	3.3	3.3	1.3	57.0	753,000	754,000
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5	0.5	0.5	0.5	< 0.2	0.5	0.5	0.5	0.6	0.6	NE	7,600,000	7,600,000
1,2,4-Trimethylbenzene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2	9.8	NE	NE
m,p-Xylene	1.1	1.1	0.9	1.1	< 0.4	0.9	1.0	1.0	1.0	0.8	11.0	435,000	435,000
o-Xylene	0.4	0.4	0.3	0.4	< 0.2	0.3	0.3	0.3	0.3	0.3	7.1	435,000	435,000
SEMI QUANTITATIVE COMPOUNDS													
2,6-Dimethyl-7-octen-2-ol	7.0	8.0	5.0	4.0	< 4.0	6.0	4.0	6.0	7.0	< 4.0	NE	NE	NE
Acetaldehyde	60.0	60.0	22.0	33.0	< 4.0	20.0	26.0	52.0	22.0	< 4.0	NE	NE	360,000
Benzaldehyde	7.0	7.0	5.0	6.0	< 4.0	5.0	5.0	7.0	6.0	< 4.0	NE	NE	NE
Butane (C 4)	10.0	10.0	10.0	13.0	< 4.0	5.0	5.0	7.0	7.0	29.0	NE	NE	NE
1-Butanol	30.0	30.0	23.0	36.0	< 4.0	22.0	17.0	15.0	26.0	< 4.0	NE	60,000	300,000
1-Butoxy-2-propanol	4.0	< 4.0	< 4.0	5.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	NE	NE	NE
2-Butoxyethanol	22.0	24.0	17.0	26.0	< 4.0	16.0	13.0	23.0	24	< 4.0	NE	97,000	240,000
Butoxyethoxyethanol	45.0	42.0	17.0	18.0	< 4.0	29.0	16.0	40.0	34.0	< 4.0	NE	67,000	NE
4-tert-Butylcyclohexyl acetate	5.0	6.0	< 4.0	< 4.0	< 4.0	5.0	< 4.0	< 4.0	5.0	< 4.0	NE	NE	NE
C12-C14 Hydrocarbon[1]	8.0	10.0	7	5.0	< 4.0	7.0	6.0	6.0	9.0	< 4.0	NE	NE	NE
C12-C14 Hydrocarbon[2]	< 4.0	5.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	NE	NE	NE
C14-C16 Hydrocarbon	< 4.0	< 4.0	4	< 4.0	< 4.0	< 4.0	10.0	< 4.0	< 4.0	< 4.0	NE	NE	NE
C7-C9 Hydrocarbon	10.0	10.0	9	11	< 4.0	7.0	6.0	8.0	8.0	< 4.0	NE	NE	NE
Decanal	< 4.0	6.0	5	< 4.0	< 4.0	7.0	9.0	14.0	7.0	< 4.0	NE	NE	NE
Diethylene glycol ethyl ether	29.0	15.0	11	8.0	< 4.0	9.0	9.0	23.0	21.0	< 4.0	NE	NE	NE
Dipropylene glycol methyl ether	420.0	450.0	240	320.0	< 4.0	270.0	190.0	330.0	300.0	15.0	NE	NE	NE
Dodecane (C 12)	8.0	8.0	6.0	7.0	< 4.0	6.0	5.0	8.0	7.0	< 4.0	NE	NE	NE
2-Ethyl-1-hexanol	18.0	18.0	19.0	18.0	< 4.0	15.0	15.0	18.0	18.0	< 4.0	NE	NE	NE
Ethylene Glycol	57.0	53.0	73.0	58.0	< 4.0	43.0	91.0	41.0	56.0	< 4.0	NE	NE	NE
Isobutane	10.0	9.0	10.0	9.0	< 4.0	4.0	5.0	5.0	6.0	9.0	NE	NE	NE
Isohexadecane	7.0	7.0	6.0	5.0	< 4.0	< 4.0	< 4.0	< 4.0	7.0	< 4.0	NE	NE	NE
Isoprene	7.0	8.0	6.0	4.0	< 4.0	7.0	6.0	< 4.0	9.0	< 4.0	9.5	NE	NE
Limonene	50.0	70.0	23.0	22.0	< 4.0	25.0	17.0	21.0	42.0	8.0	20.0	NE	NE
Menthol	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	5.0	< 4.0	< 4.0	< 4.0	NE	NE	NE
Methoxy-2-propanol	7.0	7.0	6.0	6.0	< 4.0	7.0	6.0	5.0	10.0	< 4.0	NE	NE	NE
2-Methylbutane	6.0	5.0	5.0	6.0	< 4.0	< 4.0	< 4.0	< 4.0	5.0	4.0	NE	2,950,000	2,950,000
Nonanal	5.0	5.0	< 4.0	6.0	< 4.0	< 4.0	5.0	13.0	< 4.0	< 4.0	NE	NE	NE
Octamethylcyclotetrasiloxane (D4)	5.0	6.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	5.0	< 4.0	NE	NE	NE
Pentane (C 5)	23.0	25.0	18.0	17.0	< 4.0	27.0	22.0	22.0	29.0	8.0	NE	2,950,000	295,000
1-Propanol	7.0	6.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	NE	250,000	500,000
n-Propylacetate	7.0	9.0	5.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	15.0	< 4.0	NE	420,000	840,000
Propylene glycol	14.0	14.0	13.0	8.0	< 4.0	14.0	16.0	12.0	14.0	< 4.0	NE	NE	NE
Tetradecane (C 14)	6.0	5.0	< 4.0	< 4.0	< 4.0	4.0	4.0	5.0	5.0	< 4.0	NE	NE	NE
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	34.0	47.0	12.0	9.0	< 4.0	30.0	17.0	8.0	20.0	< 4.0	NE	NE	NE
Texanol-A	200.0	240.0	220.0	260.0	< 4.0	170.0	130.0	220.0	300.0	9.0	NE	NE	NE
Texanol-B	250.0	300.0	280.0	330.0	< 4.0	230.0	170.0	270.0	390.0	19.0	NE	NE	NE
Tridecane (C 13)	6.0	6.0	< 4.0	5.0	< 4.0	5.0	4.0	6.0	5.0	< 4.0	NE	NE	NE
Urea	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	4.0	8.0	< 4.0	< 4.0	NE	NE	NE

[1] *Contains silicon and oxygen; appears to be a siloxane*

[2] *Cyclic; may be a terpene*

NE = Not Established

TABLE 2.

RESULTS ABOVE NEW YORK STATE DEPARTMENT OF HEALTH SURVEY, AND COMPARED TO ACGIH THRESHOLD LIMIT VALUES (TLV) AND OSHA PERMISSIBLE EXPOSURE LIMITS (PEL)

Table 2. Results above New York State Department of Health Survey, and compared to ACGIH Threshold Limit Values (TLV) and OSHA Permissable Exposure Limits (PEL)													
Compound	**Room 7 (ng/L)**	**Room 10 (ng/L)**	**Room 3 (ng/L)**	**Room 4 (ng/L)**	**Library (ng/L)**	**Room 26 (ng/L)**	**SE Hallway between Rooms 36 & 37 (ng/L)**	**Room 31 (ng/L)**	**Room 14 (ng/L)**	**Hall Outside of Little Theater (ng/L)**	**NYS DOH Upper Fence Limit (ng/L)**	**ACGIH Threshold Limit Value (ng/L)**	**OSHA PEL (ng/L)**
TO-17 Compounds													
Carbon Tetrachloride	**0.7**	**0.7**	**0.7**	**0.7**	< 0.2	**0.9**	**1.4**	**0.8**	**0.8**	**0.5**	**1.3**	**31,500**	**63,000**
1,4-Dichlorobenzene	**2.9**	**3.1**	**2.5**	**2.3**	< 0.2	**3.5**	**4.4**	**4.3**	**3.1**	**0.5**	**1.2**	**60,000**	**450,000**
Ethanol	**1,500.0**	**1,400.0**	**790.0**	**1,100.0**	**8.8**	**720.0**	**820.0**	**670.0**	**970.0**	**260.0**	**1,300.0**	**NE**	**1,900,000**
4-Methyl-2-pentanone	**1.6**	**2.2**	**1.3**	**1.3**	< 0.2	**2.9**	**1.1**	**1.3**	**1.9**	**1.0**	**1.9**	**82,000**	**410,000**
Limonene	**50.0**	**70.0**	**23.0**	**22.0**	< 4.0	**25.0**	**17.0**	**21.0**	**42.0**	**8.0**	**20.0**	**NE**	**NE**