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# **INDOOR AIR QUALITY EVALUATION REPORT**

## **Associated with Roof Project**

### **Pinelands Regional School District Pinelands Middle School**

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Pinelands Regional School District  
520 Nugentown Road  
Little Egg Harbor, NJ 08087

Survey date: 08/10/2017  
Inspection performed by: Domenic D'Errico, CIEC

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## Section I

## Introduction

AHERA Consultants Inc. was retained by the Pineland Regional School District to conduct a second round of indoor air quality analysis and testing utilizing TO-15 canisters in specific areas of the Pinelands Junior High School located in Little Egg Harbor, New Jersey. This study was performed at the request of the District as follow up and in association with the *roofing cap sheet installation*.

## Section II

## Physical Inspection

### Existing Conditions

On August 10, 2017 I, Domenic D'Errico, CIEC, arrived at the Pinelands Junior High School and met with Bob Sannino, from New Road Construction. We reviewed the ongoing roofing activities and he escorted me through the 2 active work areas. I assessed each of the spaces and found roofing cap sheet installation above each of the areas of concern.

I conducted a cursory walk-through and visual inspection of each space designated and noted a slight odor present. The building is currently undergoing a roof replacement/renovation project and I observed construction related dust and debris in areas adjacent to the testing sites. At the time of sampling, occupant activities to the spaces designated for testing had been restricted and most of the buildings HVAC systems were interrupted due to construction activities. I also noted that at the time of testing the occupants of the building appeared to consist of the main office staff, custodial staff, construction personnel and summer camp staff and attendants who were located in the gymnasium area.

This second round of sampling also utilized TO-15 canisters for detection of Volatile Organic Compounds (VOC's) that may be associated with roofing materials. In addition to TO-15 sampling, an IAQ-Calc Indoor Air Quality Meter (Model 7545) was utilized to assess current air quality conditions with respect to temperature, humidity, carbon dioxide CO<sup>2</sup> and carbon monoxide CO in all areas sampled and an ambient control sample was collected outside on the roof.

## Section III

## Sampling Procedures

- ◇ Laboratory calibrated TO-15 canisters were utilized and field verified. 1 canister was set up in each of the following areas: Cafeteria, Boy's Locker Room adjacent main gymnasium and one on the roof between the 2 active work areas. The sampling media was submitted to EMSL Analytical Laboratories in Cinnaminson, NJ for analysis. Samples were analyzed within a 3-day turnaround period. ***(NOTE: The outside roof sample regulator failed at some point during sampling and analysis of the sample was voided by laboratory.)***
- ◇ Indoor air quality measurements for temperature, humidity, CO<sup>2</sup> and CO were taken utilizing a Model 7545 IAQ-Calc Indoor Air Quality Meter in both areas as well as one sample outdoors.

## Section V

## Interpretation of Results

At this time, there are no governmental standards regarding Indoor Air Quality. The Occupational Safety and Health Association (OSHA) and the National Institute of Occupational Safety and Health (NIOSH), as well as other occupational health related associations, have permissible exposure levels (PELs), recommended exposure limits (RELs), or other limit values for many but not all Volatile Organic Compounds. For the purposes of this report USEPA Residential Air Generic Screening Levels were utilized since this would be a comprehensive comparison standard. (See EMSL TO-15 Report) provided herein for comparative levels.

Under the Public Employees Occupational Safety and Health Program there is currently an indoor air quality standard for the state of New Jersey (NJAC 12:100-13). Additionally, there are recommendations under ASHRAE "The American Society of Heating, Refrigeration, and Air Conditioning Engineers for the Indoor Environment.

Under NJAC 12:100-13 a range of 68 to 79 degrees Fahrenheit is the desired temperature range to maintain with Carbon Dioxide (CO<sup>2</sup>) not exceeding 1000 ppm. If Carbon Dioxide (CO<sup>2</sup>) exceeds 1000 PPM the HVAC system should be evaluated for proper operation.

ASHRAE recommends that a relative humidity between 30% and 60% are acceptable, readings in excess of 70% is considered a friendly environment to microorganisms such as mold.

Carbon Monoxide (CO) levels based on OSHA limits long-term workplace exposure levels to 50 ppm over an 8-hour time weighted average. The Threshold Limit Value or TLV for carbon monoxide is 25 ppm.

## Section VI

## Observations/Recommended Response Actions

### Sample Area #1

**Sample Location:** Junior High School - Cafeteria

**TO-15 Sampling:** 12 Target Compounds were identified in the sampling media collected.

Levels of *all* compounds detected fell well below the Residential Guidelines established. (See the attached EMSL Sample results USEPA Generic Air Screening Level Summary Table)

**IAQ Testing:** Temperature, humidity, carbon dioxide (CO<sup>2</sup>) and carbon monoxide (CO) readings collected were all within acceptable levels at time of testing. (See IAQ Investigation Log)

**EMSL Analytical**

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EMSL Order #: **491700811**  
 EMSL Sample #: **491700811-3**  
 Customer ID: **AHER50**  
 Customer PO: **Not Available**

Attn: **Domenic D'Errico**  
**Ahera Consultants, Inc.**  
**PO Box 385**  
**Oceanville, NJ 08231-0385**

Phone: **609-652-1833**  
 Fax: **609-652-1140**  
 Date Collected: **8/10/2017**  
 Date Received: **8/10/2017**

Project: **Pinelands Junior HS**Sample ID: **Cafeteria**

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	08/12/2017	TP	J1595.D	E15641	250 cc	1

**USEPA Generic Air Screening Level Summary Table**

Target Compounds	CAS#	MW	Result ppbv	Q	Result ug/m3	Residential ug/m3	>	Industrial ug/m3	>
Propylene	115-07-1	42.08	ND		ND	3100		13000	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.90	0.73		3.6	100		440	
Freon 114(1,2-Dichlorotetrafluoroethan	76-14-2	170.90	ND		ND	N.E.		N.E.	
Chloromethane	74-87-3	50.49	ND		ND	94.0		390	
n-Butane	106-97-8	58.12	3.4		8.1	N.E.		N.E.	
Vinyl chloride	75-01-4	62.50	ND		ND	0.170		2.80	
1,3-Butadiene	106-99-0	54.09	ND		ND	0.0940		0.410	
Bromomethane	74-83-9	94.94	ND		ND	5.20		22.0	
Chloroethane	75-00-3	64.52	ND		ND	10000		44000	
Ethanol	64-17-5	46.07	20		37	N.E.		N.E.	
Bromoethene(Vinyl bromide)	593-60-2	106.90	ND		ND	0.0880		0.380	
Freon 11(Trichlorofluoromethane)	75-69-4	137.40	8.5		48	N.E.		N.E.	
Isopropyl alcohol(2-Propanol)	67-63-0	60.10	2.5		6.2	210		880	
Freon 113(1,1,2-Trichlorotrifluoroethan	76-13-1	187.40	ND		ND	31000		130000	
Acetone	67-64-1	58.08	8.8		21	32000		140000	
1,1-Dichloroethene	75-35-4	96.94	ND		ND	210		880	
Acetonitrile	75-05-8	41.00	ND		ND	63.0		260	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	ND		ND	N.E.		N.E.	
Bromoethane(Ethyl bromide)	74-96-4	108.00	ND		ND	N.E.		N.E.	
3-Chloropropene(Allyl chloride)	107-05-1	76.53	ND		ND	0.470		2.00	
Carbon disulfide	75-15-0	76.14	ND		ND	730		3100	
Methylene chloride	75-09-2	84.94	1.2		4.1	100		1200	
Acrylonitrile	107-13-1	53.00	ND		ND	0.0410		0.180	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND		ND	11.0		47.0	
trans-1,2-Dichloroethene	156-60-5	96.94	ND		ND	N.E.		N.E.	
n-Hexane	110-54-3	86.17	ND		ND	730		3100	
1,1-Dichloroethane	75-34-3	98.96	ND		ND	1.80		7.70	
Vinyl acetate	108-05-4	86.00	ND		ND	210		880	
2-Butanone(MEK)	78-93-3	72.10	1.9		5.7	5200		22000	
cis-1,2-Dichloroethene	156-59-2	96.94	ND		ND	N.E.		N.E.	
Ethyl acetate	141-78-6	88.10	2.0		7.3	73.0		310	
Chloroform	67-66-3	119.40	ND		ND	0.120		0.530	
Tetrahydrofuran	109-99-9	72.11	ND		ND	2100		8800	
1,1,1-Trichloroethane	71-55-6	133.40	ND		ND	5200		22000	
Cyclohexane	110-82-7	84.16	ND		ND	6300		26000	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.20	ND		ND	N.E.		N.E.	
Carbon tetrachloride	56-23-5	153.80	ND		ND	0.470		2.00	
n-Heptane	142-82-5	100.20	ND		ND	N.E.		N.E.	
1,2-Dichloroethane	107-06-2	98.96	ND		ND	0.110		0.470	
Benzene	71-43-2	78.11	ND		ND	0.360		1.60	
Trichloroethene	79-01-6	131.40	ND		ND	0.480		3.00	
1,2-Dichloropropane	78-87-5	113.00	ND		ND	0.280		1.20	
Methyl Methacrylate	80-62-6	100.12	ND		ND	730		3100	
Bromodichloromethane	75-27-4	163.80	ND		ND	0.0760		0.330	
1,4-Dioxane	123-91-1	88.12	ND		ND	0.560		2.50	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.20	ND		ND	3100		13000	

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Phone: **609-652-1833**  
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 Date Collected: **8/10/2017**  
 Date Received: **8/10/2017**

Project: **Pinelands Junior HS**Sample ID: **Cafeteria**

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	08/12/2017	TP	J1595.D	E15641	250 cc	1

**USEPA Generic Air Screening Level Summary Table**

Target Compounds	CAS#	MW	Result ppbv	Q	Result ug/m3	Residential ug/m3	>	Industrial ug/m3	>
cis-1,3-Dichloropropene**	10061-01-5	111.00	ND		ND	N.E.		N.E.	
Toluene	108-88-3	92.14	ND		ND	5200		22000	
trans-1,3-Dichloropropene**	10061-02-6	111.00	ND		ND	N.E.		N.E.	
1,1,2-Trichloroethane	79-00-5	133.40	ND		ND	0.180		0.770	
2-Hexanone(MBK)	591-78-6	100.10	ND		ND	31.0		130	
Tetrachloroethene	127-18-4	165.80	ND		ND	11.0		47.0	
Dibromochloromethane	124-48-1	208.30	ND		ND	N.E.		N.E.	
1,2-Dibromoethane	106-93-4	187.80	ND		ND	0.00470		0.0200	
Chlorobenzene	108-90-7	112.60	ND		ND	52.0		220	
Ethylbenzene	100-41-4	106.20	ND		ND	1.10		4.90	
Xylene (p,m)	1330-20-7	106.20	ND		ND	100		440	
Xylene (Ortho)	95-47-6	106.20	ND		ND	100		440	
Styrene	100-42-5	104.10	ND		ND	1000		4400	
Isopropylbenzene (cumene)	98-82-8	120.19	ND		ND	420		1800	
Bromoform	75-25-2	252.80	ND		ND	2.60		11.0	
1,1,2,2-Tetrachloroethane	79-34-5	167.90	ND		ND	0.0480		0.210	
4-Ethyltoluene	622-96-8	120.20	0.84		4.1	N.E.		N.E.	
1,3,5-Trimethylbenzene	108-67-8	120.20	0.54		2.7	N.E.		N.E.	
2-Chlorotoluene	95-49-8	126.60	ND		ND	N.E.		N.E.	
1,2,4-Trimethylbenzene	95-63-6	120.20	1.4		6.6	7.30		31.0	
1,3-Dichlorobenzene	541-73-1	147.00	ND		ND	N.E.		N.E.	
1,4-Dichlorobenzene	106-46-7	147.00	ND		ND	0.260		1.10	
Benzyl chloride	100-44-7	126.00	ND		ND	0.0570		0.250	
1,2-Dichlorobenzene	95-50-1	147.00	ND		ND	210		880	
1,2,4-Trichlorobenzene	120-82-1	181.50	ND		ND	2.10		8.80	
Hexachloro-1,3-butadiene	87-68-3	260.80	ND		ND	0.130		0.560	
Naphthalene	91-20-3	128.17	ND		ND	0.0830		0.360	

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

The > column is used to flag exceedences as marked

Exposure Limit Definitions

RSL= Regional Screening Level (Target Hazard Quotient (THQ) =0.1 if available, otherwise THQ = 1)

Agency Definitions

United States Environmental Protection Agency

Reference

EPA Regional Screening Levels (RSLs), May 2016

Compound Exposure Definitions

NE= No Limit Established

LFC= Lowest Feasible Concentration

NS= No Screening Value

Regional Screening Level Definition

Target Hazard Quotients (THQ)=0.1 is used for screening when multiple contaminants of concern are



NJDEP Certification #: 03036

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 Date Collected: **8/10/2017**  
 Date Received: **8/10/2017**

Project: **Pinelands Junior HS**

Sample ID: **Cafeteria**

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	08/12/2017	TP	J1595.D	E15641	250 cc	1

**Possible Background Sources of Contaminants**

Target Compounds	CAS#	Result ppbv	Q	Result ug/m3	Use and Possible Sources
Freon 12(Dichlorodifluoromethane)	75-71-8	0.73		3.6	Refrigerant (CFCs) and cleaning solvent. Was phased out as a refrigerant in 1996. <sup>1</sup>
n-Butane	106-97-8	3.4		8.1	Aerosol spray products for some paints, cosmetics, automotive products, leather treatments, pesticides. <sup>2</sup>
Ethanol	64-17-5	20		37	Hand sanitizers, disinfecting wipes. Personal care products: nail polish, nail polish remover, colognes, perfumes, rubbing alcohol, hair spray. <sup>2</sup>
Freon 11(Trichlorofluoromethane)	75-69-4	8.5		48	Refrigerant from air conditioners, freezers, refrigerators, dehumidifiers. <sup>2</sup>
Isopropyl alcohol(2-Propanol)	67-63-0	2.5		6.2	Eye Glass Cleaners. Disinfecting wipes. Personal care products: nail polish, nail polish remover, colognes, perfumes, rubbing alcohol, hair spray. <sup>2</sup>
Acetone	67-64-1	8.8		21	Rubber cement, cleaning fluids, scented candles and nail polish remover. <sup>1</sup>
Methylene chloride	75-09-2	1.2		4.1	Methylene chloride is used as an industrial solvent and as a paint stripper. It may also be found in some aerosol and pesticide products and is used in the manufacture of photographic film. <sup>4</sup> Hairspray, paint stripper, rug cleaners, insecticides and furniture polish. <sup>1</sup>
2-Butanone(MEK)	78-93-3	1.9		5.7	2-Butanone is produced in large quantities. Nearly half of its use is in paints and other coatings because it will quickly evaporate into the air and it dissolves many substances. <sup>4</sup> Can occur from automobile exhaust, printing inks, fragrance/flavoring agent in candy and perfume, paint, glue, cleaning agents and cigarette smoke. <sup>1</sup>
Ethyl acetate	141-78-6	2.0		7.3	Personal care products: nail polish, nail polish remover, colognes, perfumes, rubbing alcohol, hair spray. <sup>2</sup>
4-Ethyltoluene	622-96-8	0.84		4.1	Used in commercial products, building products, or wood office furnishings. Flat water thinned interior paints and tinting bases. Scatter rugs, bathmats, and sets. <sup>11</sup>
1,3,5-Trimethylbenzene	108-67-8	0.54		2.7	1,3,5-Trimethylbenzene is used in dyes, solvents, paint thinners and plastics. 1,3,5-Trimethylbenzene is emitted into the air by emissions from gasoline-powered vehicles, waste treatment plants and coal-fired power stations. Occurs in petroleum and coal tar. <sup>10</sup>
1,2,4-Trimethylbenzene	95-63-6	1.4		6.6	Gasoline additive and automobile exhaust. <sup>1</sup>

**Qualifier Definitions**

**ND = Non Detect**

B = Compound also found in method blank.

E= Estimated concentration exceeding upper calibration range.

D= Result reported from diluted analysis.

**Sources References**

- (1) NJDEP "Common Household Sources of Background Indoor Air Contamination". June 26, 2012
- (2) NYSDOH "Volatile Organic Compounds (VOCs) in Commonly Used Products", 2007
- (3) EPA, Air & Radiation, TTN Web - Technology Transfer Network Air Toxics Web site, various years.
- (4) Agency for Toxic Substances and Disease Registry (ATSDR). U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1998.
- (5) OFFICE OF POLLUTION PREVENTION AND TOXICS, U.S. ENVIRONMENTAL PROTECTION AGENCY, August 1994, EPA 749-F-94-012a
- (6) U.S. Environmental Protection Agency, Office of Research and Development, Cincinnati, OH. 1985.
- (7) World Health Organization,
- (8) Product Safety Assessment, Revised: November 19, 2010 The Dow Chemical Company
- (9) California Office of Environmental Health Hazard Assessment, PROPOSED ACTION LEVEL FOR 2-CHLOROTOLUENE
- (10) Delaware Health and Social Services, Division of Public Health, Revised: 01/2010
- (11) USEPA, Envirofacts Master Chemical Integrator (EMCI), Scorecard, 4/10/2009



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EMSL Order #: **491700811**  
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 Customer ID: **AHER50**  
 Customer PO: **Not Available**

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 Date Collected: **8/10/2017**  
 Date Received: **8/10/2017**

Project: **Pinelands Junior HS**

Sample ID: Cafeteria

<u>Analysis</u>	<u>Analysis Date</u>	<u>Analyst Init.</u>	<u>Lab File ID</u>	<u>Canister ID</u>	<u>Sample Vol.</u>	<u>Dil. Factor</u>
Initial	08/12/2017	TP	J1595.D	E15641	250 cc	1

**Possible Background Sources of Contaminants**

Target Compounds	CAS#	Result ppbv	Q	Result ug/m3	Use and Possible Sources
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NJDEP Certification #: 03036

IAQ Investigation Log		
Test ID:	Pinelands MS	Cafeteria

Model Number:	7545
Serial Number:	T75450953002
Test ID:	1
Test Abbreviation:	Test 001
Start Date:	8/10/2017
Start Time:	10:11:10
Duration (dd:hh:mm:ss):	0:00:00:51
Log Interval (mm:ss):	0:05
Number of points:	3
Notes:	Test 001



Statistics	Channel:	CO2 - Carbon Dioxide	T - Temperature	H - Humidity	CO - Carbon Monoxide
	Units:	ppm	deg F	%rh	ppm
	Average:	462	78.5	62.4	0.1
	Minimum:	456	78.4	62.1	0
	Time of Minimum:	10:12:01	10:11:34	10:11:34	10:12:01
	Date of Minimum:	8/10/2017	8/10/2017	8/10/2017	8/10/2017
	Maximum:	474	78.6	63.2	0.3
	Time of Maximum:	10:11:15	10:11:15	10:12:01	10:11:15
	Date of Maximum:	8/10/2017	8/10/2017	8/10/2017	8/10/2017

Calibration	Meter:	2/7/2017			
Calibration	Sensor:	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
	Cal. Date	2/7/2017	2/7/2017	2/7/2017	2/7/2017

Date	Time	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
MM/DD/YYYY	hh:mm:ss	ppm	deg F	%rh	ppm
8/10/2017	10:11:15	474	78.6	62.1	0.3
8/10/2017	10:11:34	456	78.4	62.1	0
8/10/2017	10:12:01	456	78.4	63.2	0

## Sample Area #2

**Sample Location:** Junior High School – Boy’s Locker Room

**TO-15 Sampling:** 13 Target Compounds were identified in the sampling media collected.

***1,2,4 Trimethylbenzene*** at **7.4 ug/m<sup>3</sup>** was the only compound identified that *slightly* exceeds the USEPA Residential Screening Level of **7.3 ug/m<sup>3</sup>** but is **below** the Industrial Screening Level **31.0 ug/m<sup>3</sup>** in this area. (See the attached EMSL Sample results USEPA Generic Air Screening Level Summary Table)

***1,2,4 Trimethylbenzene*** is a gasoline additive commonly found in internal combustion engine exhaust. Previous TO-15 sampling dated 07/26/2017 of the adjacent MS Main Gym identified levels of the compound at **19 ug/m<sup>3</sup>**. This elevated level may be attributed to the location of the gym in proximity to the Main Entrance of the building and the automotive idling that occurs habitually throughout the day. The Boy’s Locker Room is accessed through the Main Gym and is an internal space. The exhaust fumes may travel through the structure, dissipate as they are dispersed and concentrate in internal spaces if not properly exhausted.

**IAQ Testing:** Temperature, humidity, carbon dioxide (CO<sup>2</sup>) and carbon monoxide (CO) readings collected were all within acceptable levels at time of testing. (See IAQ Investigation Log)

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EMSL Order #: **491700811**  
 EMSL Sample #: **491700811-1**  
 Customer ID: **AHER50**  
 Customer PO: **Not Available**

Attn: **Domenic D'Errico**  
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 Date Collected: **8/10/2017**  
 Date Received: **8/10/2017**

Project: **Pinelands Junior HS**Sample ID: **Locker Room**

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	08/12/2017	TP	J1594.D	E12305	250 cc	1

**USEPA Generic Air Screening Level Summary Table**

Target Compounds	CAS#	MW	Result ppbv	Q	Result ug/m3	Residential ug/m3	>	Industrial ug/m3	>
Propylene	115-07-1	42.08	ND		ND	3100		13000	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.90	0.55		2.7	100		440	
Freon 114(1,2-Dichlorotetrafluoroethan	76-14-2	170.90	ND		ND	N.E.		N.E.	
Chloromethane	74-87-3	50.49	ND		ND	94.0		390	
n-Butane	106-97-8	58.12	4.6		11	N.E.		N.E.	
Vinyl chloride	75-01-4	62.50	ND		ND	0.170		2.80	
1,3-Butadiene	106-99-0	54.09	ND		ND	0.0940		0.410	
Bromomethane	74-83-9	94.94	ND		ND	5.20		22.0	
Chloroethane	75-00-3	64.52	ND		ND	10000		44000	
Ethanol	64-17-5	46.07	36		68	N.E.		N.E.	
Bromoethene(Vinyl bromide)	593-60-2	106.90	ND		ND	0.0880		0.380	
Freon 11(Trichlorofluoromethane)	75-69-4	137.40	4.3		24	N.E.		N.E.	
Isopropyl alcohol(2-Propanol)	67-63-0	60.10	1.7		4.3	210		880	
Freon 113(1,1,2-Trichlorotrifluoroethan	76-13-1	187.40	ND		ND	31000		130000	
Acetone	67-64-1	58.08	15		35	32000		140000	
1,1-Dichloroethene	75-35-4	96.94	ND		ND	210		880	
Acetonitrile	75-05-8	41.00	ND		ND	63.0		260	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	ND		ND	N.E.		N.E.	
Bromoethane(Ethyl bromide)	74-96-4	108.00	ND		ND	N.E.		N.E.	
3-Chloropropene(Allyl chloride)	107-05-1	76.53	ND		ND	0.470		2.00	
Carbon disulfide	75-15-0	76.14	ND		ND	730		3100	
Methylene chloride	75-09-2	84.94	0.85		2.9	100		1200	
Acrylonitrile	107-13-1	53.00	ND		ND	0.0410		0.180	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND		ND	11.0		47.0	
trans-1,2-Dichloroethene	156-60-5	96.94	ND		ND	N.E.		N.E.	
n-Hexane	110-54-3	86.17	ND		ND	730		3100	
1,1-Dichloroethane	75-34-3	98.96	ND		ND	1.80		7.70	
Vinyl acetate	108-05-4	86.00	ND		ND	210		880	
2-Butanone(MEK)	78-93-3	72.10	6.3		19	5200		22000	
cis-1,2-Dichloroethene	156-59-2	96.94	ND		ND	N.E.		N.E.	
Ethyl acetate	141-78-6	88.10	0.99		3.6	73.0		310	
Chloroform	67-66-3	119.40	ND		ND	0.120		0.530	
Tetrahydrofuran	109-99-9	72.11	2.3		6.7	2100		8800	
1,1,1-Trichloroethane	71-55-6	133.40	ND		ND	5200		22000	
Cyclohexane	110-82-7	84.16	ND		ND	6300		26000	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.20	ND		ND	N.E.		N.E.	
Carbon tetrachloride	56-23-5	153.80	ND		ND	0.470		2.00	
n-Heptane	142-82-5	100.20	ND		ND	N.E.		N.E.	
1,2-Dichloroethane	107-06-2	98.96	ND		ND	0.110		0.470	
Benzene	71-43-2	78.11	ND		ND	0.360		1.60	
Trichloroethene	79-01-6	131.40	ND		ND	0.480		3.00	
1,2-Dichloropropane	78-87-5	113.00	ND		ND	0.280		1.20	
Methyl Methacrylate	80-62-6	100.12	ND		ND	730		3100	
Bromodichloromethane	75-27-4	163.80	ND		ND	0.0760		0.330	
1,4-Dioxane	123-91-1	88.12	ND		ND	0.560		2.50	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.20	ND		ND	3100		13000	

**EMSL Analytical**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (856)858-4800 / (856)858-4571

<http://www.EMSL.com> [to15lab@EMSL.com](mailto:to15lab@EMSL.com)

EMSL Order #: **491700811**  
 EMSL Sample #: **491700811-1**  
 Customer ID: **AHER50**  
 Customer PO: **Not Available**

Attn: **Domenic D'Errico**  
**Ahera Consultants, Inc.**  
**PO Box 385**  
**Oceanville, NJ 08231-0385**

Phone: **609-652-1833**  
 Fax: **609-652-1140**  
 Date Collected: **8/10/2017**  
 Date Received: **8/10/2017**

Project: **Pinelands Junior HS**Sample ID: **Locker Room**

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	08/12/2017	TP	J1594.D	E12305	250 cc	1

**USEPA Generic Air Screening Level Summary Table**

Target Compounds	CAS#	MW	Result ppbv	Q	Result ug/m3	Residential ug/m3	>	Industrial ug/m3	>
cis-1,3-Dichloropropene**	10061-01-5	111.00	ND		ND	N.E.		N.E.	
Toluene	108-88-3	92.14	ND		ND	5200		22000	
trans-1,3-Dichloropropene**	10061-02-6	111.00	ND		ND	N.E.		N.E.	
1,1,2-Trichloroethane	79-00-5	133.40	ND		ND	0.180		0.770	
2-Hexanone(MBK)	591-78-6	100.10	ND		ND	31.0		130	
Tetrachloroethene	127-18-4	165.80	ND		ND	11.0		47.0	
Dibromochloromethane	124-48-1	208.30	ND		ND	N.E.		N.E.	
1,2-Dibromoethane	106-93-4	187.80	ND		ND	0.00470		0.0200	
Chlorobenzene	108-90-7	112.60	ND		ND	52.0		220	
Ethylbenzene	100-41-4	106.20	ND		ND	1.10		4.90	
Xylene (p,m)	1330-20-7	106.20	ND		ND	100		440	
Xylene (Ortho)	95-47-6	106.20	ND		ND	100		440	
Styrene	100-42-5	104.10	ND		ND	1000		4400	
Isopropylbenzene (cumene)	98-82-8	120.19	ND		ND	420		1800	
Bromoform	75-25-2	252.80	ND		ND	2.60		11.0	
1,1,2,2-Tetrachloroethane	79-34-5	167.90	ND		ND	0.0480		0.210	
4-Ethyltoluene	622-96-8	120.20	0.95		4.7	N.E.		N.E.	
1,3,5-Trimethylbenzene	108-67-8	120.20	0.59		2.9	N.E.		N.E.	
2-Chlorotoluene	95-49-8	126.60	ND		ND	N.E.		N.E.	
1,2,4-Trimethylbenzene	95-63-6	120.20	1.5		7.4	7.30		31.0	
1,3-Dichlorobenzene	541-73-1	147.00	ND		ND	N.E.		N.E.	
1,4-Dichlorobenzene	106-46-7	147.00	ND		ND	0.260		1.10	
Benzyl chloride	100-44-7	126.00	ND		ND	0.0570		0.250	
1,2-Dichlorobenzene	95-50-1	147.00	ND		ND	210		880	
1,2,4-Trichlorobenzene	120-82-1	181.50	ND		ND	2.10		8.80	
Hexachloro-1,3-butadiene	87-68-3	260.80	ND		ND	0.130		0.560	
Naphthalene	91-20-3	128.17	ND		ND	0.0830		0.360	

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

The > column is used to flag exceedences as marked

**Exposure Limit Definitions**

RSL= Regional Screening Level (Target Hazard Quotient (THQ) =0.1 if available, otherwise THQ = 1)

**Agency Definitions**

United States Environmental Protection Agency

**Reference**

EPA Regional Screening Levels (RSLs), May 2016

**Compound Exposure Definitions**

NE= No Limit Established

LFC= Lowest Feasible Concentration

NS= No Screening Value

**Regional Screening Level Definition**

Target Hazard Quotients (THQ)=0.1 is used for screening when multiple contaminants of concern are



NJDEP Certification #: 03036

**EMSL Analytical**

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 Phone/Fax: (856)858-4800 / (856)858-4571  
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EMSL Order #: **491700811**  
 EMSL Sample #: **491700811-1**  
 Customer ID: **AHER50**  
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Phone: **609-652-1833**  
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 Date Collected: **8/10/2017**  
 Date Received: **8/10/2017**

Project: **Pinelands Junior HS**

Sample ID: **Locker Room**

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	08/12/2017	TP	J1594.D	E12305	250 cc	1

**Possible Background Sources of Contaminants**

Target Compounds	CAS#	Result ppbv	Q	Result ug/m3	Use and Possible Sources
Freon 12(Dichlorodifluoromethane)	75-71-8	0.55		2.7	Refrigerant (CFCs) and cleaning solvent. Was phased out as a refrigerant in 1996. <sup>1</sup>
n-Butane	106-97-8	4.6		11	Aerosol spray products for some paints, cosmetics, automotive products, leather treatments, pesticides. <sup>2</sup>
Ethanol	64-17-5	36		68	Hand sanitizers, disinfecting wipes. Personal care products: nail polish, nail polish remover, colognes, perfumes, rubbing alcohol, hair spray. <sup>2</sup>
Freon 11(Trichlorofluoromethane)	75-69-4	4.3		24	Refrigerant from air conditioners, freezers, refrigerators, dehumidifiers. <sup>2</sup>
Isopropyl alcohol(2-Propanol)	67-63-0	1.7		4.3	Eye Glass Cleaners. Disinfecting wipes. Personal care products: nail polish, nail polish remover, colognes, perfumes, rubbing alcohol, hair spray. <sup>2</sup>
Acetone	67-64-1	15		35	Rubber cement, cleaning fluids, scented candles and nail polish remover. <sup>1</sup>
Methylene chloride	75-09-2	0.85		2.9	Methylene chloride is used as an industrial solvent and as a paint stripper. It may also be found in some aerosol and pesticide products and is used in the manufacture of photographic film. <sup>4</sup> Hairspray, paint stripper, rug cleaners, insecticides and furniture polish. <sup>1</sup>
2-Butanone(MEK)	78-93-3	6.3		19	2-Butanone is produced in large quantities. Nearly half of its use is in paints and other coatings because it will quickly evaporate into the air and it dissolves many substances. <sup>4</sup> Can occur from automobile exhaust, printing inks, fragrance/flavoring agent in candy and perfume, paint, glue, cleaning agents and cigarette smoke. <sup>1</sup>
Ethyl acetate	141-78-6	0.99		3.6	Personal care products: nail polish, nail polish remover, colognes, perfumes, rubbing alcohol, hair spray. <sup>2</sup>
Tetrahydrofuran	109-99-9	2.3		6.7	PVC cement and primer, various adhesives, contact cement, model cement. <sup>2</sup>
4-Ethyltoluene	622-96-8	0.95		4.7	Used in commercial products, building products, or wood office furnishings. Flat water thinned interior paints and tinting bases. Scatter rugs, bathmats, and sets. <sup>11</sup>
1,3,5-Trimethylbenzene	108-67-8	0.59		2.9	1,3,5-Trimethylbenzene is used in dyes, solvents, paint thinners and plastics. 1,3,5-Trimethylbenzene is emitted into the air by emissions from gasoline-powered vehicles, waste treatment plants and coal-fired power stations.
1,2,4-Trimethylbenzene	95-63-6	1.5		7.4	Occurs in petroleum and coal tar. <sup>10</sup> Gasoline additive and automobile exhaust. <sup>1</sup>

**Qualifier Definitions**

**ND = Non Detect**

B = Compound also found in method blank.

E = Estimated concentration exceeding upper calibration range.

D = Result reported from diluted analysis.

**Sources References**

(1) NJDEP "Common Household Sources of Background Indoor Air Contamination". June 26, 2012

(2) NYSDOH "Volatile Organic Compounds (VOCs) in Commonly Used Products", 2007

(3) EPA, Air & Radiation, TTN Web - Technology Transfer Network Air Toxics Web site, various years.

(4) Agency for Toxic Substances and Disease Registry (ATSDR). U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1998.

(5) OFFICE OF POLLUTION PREVENTION AND TOXICS, U.S. ENVIRONMENTAL PROTECTION AGENCY, August 1994, EPA 749-F-94-012a



IAQ Investigation Log	
Test ID:	Pinelands MS Locker Room
Model Number:	7545
Serial Number:	T75450953002
Test ID:	2
Test Abbreviation:	Test 002
Start Date:	8/10/2017
Start Time:	10:15:18
Duration (dd:hh:mm:ss):	0:00:00:42
Log Interval (mm:ss):	0:05
Number of points:	4
Notes:	Test 002



Statistics	Channel:	CO2 - Carbon Dioxide	T - Temperature	H - Humidity	CO - Carbon Monoxide
	Units:	ppm	deg F	%rh	ppm
	Average:	522	78.4	64	0
	Minimum:	504	78.4	63.9	0
	Time of Minimum:	10:16:00	10:15:49	10:15:49	10:15:37
	Date of Minimum:	8/10/2017	8/10/2017	8/10/2017	8/10/2017
	Maximum:	557	78.4	64.3	0
	Time of Maximum:	10:15:23	10:15:23	10:15:23	10:15:23
	Date of Maximum:	8/10/2017	8/10/2017	8/10/2017	8/10/2017

Calibration	Meter:	2/7/2017			
Calibration	Sensor:	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
	Cal. Date	2/7/2017	2/7/2017	2/7/2017	2/7/2017

Date	Time	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
MM/DD/YYYY	hh:mm:ss	ppm	deg F	%rh	ppm
8/10/2017	10:15:23	557	78.4	64.3	0
8/10/2017	10:15:37	510	78.4	64	0
8/10/2017	10:15:49	518	78.4	63.9	0
8/10/2017	10:16:00	504	78.4	63.9	0

### Sample Area #3

**Sample Location:** Junior High School - Roof

**TO-15 Sampling:** Sample regulator failed. Laboratory voided sample.

**IAQ Testing:** Temperature, humidity, carbon dioxide (CO<sup>2</sup>) and carbon monoxide (CO) readings collected were all within acceptable levels at time of testing. (See IAQ Investigation Log)

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IAQ Investigation Log		
Test ID:	Pinelands MS	Outdoors
Model Number:	7545	
Serial Number:	T75450953002	
Test ID:	3	
Test Abbreviation:	Test 003	
Start Date:	8/10/2017	
Start Time:	10:18:30	
Duration (dd:hh:mm:ss):	0:00:01:31	
Log Interval (mm:ss):	0:05	
Number of points:	4	
Notes:	Test 003	



Statistics	Channel:	CO2 - Carbon Dioxide	T - Temperature	H - Humidity	CO - Carbon Monoxide
	Units:	ppm	deg F	%rh	ppm
	Average:	389	80.4	62.4	0
	Minimum:	380	78.6	60	0
	Time of Minimum:	10:19:12	10:19:12	10:19:12	10:18:53
	Date of Minimum:	8/10/2017	8/10/2017	8/10/2017	8/10/2017
	Maximum:	408	83.9	64.3	0
	Time of Maximum:	10:20:01	10:20:01	10:18:35	10:18:35
	Date of Maximum:	8/10/2017	8/10/2017	8/10/2017	8/10/2017

Calibration	Meter:	2/7/2017			
Calibration	Sensor:	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
	Cal. Date	2/7/2017	2/7/2017	2/7/2017	2/7/2017

Date	Time	CO2 - Carbon Dioxide	T-Temperature	H-Humidity	CO - Carbon Monoxide
MM/DD/YYYY	hh:mm:ss	ppm	deg F	%rh	ppm
8/10/2017	10:18:35	386	79.3	64.3	0
8/10/2017	10:18:53	384	79.7	63	0
8/10/2017	10:19:12	380	78.6	60	0
8/10/2017	10:20:01	408	83.9	62.2	0

### **Junior High School Summary**

The following item(s) exceeded USEPA Generic Screening Levels:

- 1,2,4 Trimethylbenzene is found in gasoline additives and automobile exhaust. Note: levels were lower than the initial testing.

### **Recommendations:**

It was noted that buses and cars were using zones adjacent the areas sampled as a student drop off at the time of testing. The identification of 1,2,4 Trimethylbenzene may be a result of idling cars and buses at the drop off/pick up location. There is no signage located in this area deterring this activity. However, we would recommend installing signage in these areas and if possible have the drop off point further from the building.

Increasing fresh air exchanges within the affected areas would help ameliorate and/or maintain acceptable indoor air quality. The TO-15's do show significant improvement from the initial set collected in adjacent areas. The 1,2,4 Trimethylbenzene that is slightly over the Residential Limit drops significantly from previous test collected in the adjacent Gymnasium. Please see our recommendations above to help reduce this limit furthermore.