Midwest	
Environm	ലാരി
Consultin	g Services, Inc.
Consultants	Engineers – Scientists

Providing Quality Service Since 1994

IAQ & MOLD AIR SAMPLING REPORT

Performed for:

LINCOLNSHIRE-PRAIRIE VIEW SCHOOL DISTRICT #103

1370 N. Riverwoods Road Lincolnshire, IL 60069

Project Location:



HALF DAY SCHOOL 239 Olde Half Day Road Lincolnshire, IL 60069

Testing Dates: January 10 - 17, 2018

MEC PROJECT #: 17-12-968-I.H.

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EXECUTIVE SUMMARY

Midwest Environmental Consulting Services, Inc. (MEC) was retained by Lincolnshire – Prairie View School District #103 to provide indoor air quality (IAQ) monitoring and nonviable mold air sampling within select areas at Half Day School, located at 239 Olde Half Day Road in Lincolnshire, Illinois 60069.

IAQ monitoring included testing and recording the ambient air temperature, percent relative humidity, carbon dioxide, and carbon monoxide levels within specific areas of the school as designated by Lincolnshire – Prairie View School District #103 staff.

The purposes for the monitoring and sampling was:

- 1. To determine whether common air quality parameters were consistent with regulatory and industry standards, and
- 2. to determine whether airborne mold concentrations at select locations within the building were significantly different from those present in the outdoor air.

Indoor air quality monitoring and recording was performed from January 10 – 17, 2018. Non-viable mold air sampling was performed on January 10, 2018.

• Ambient Temperature, Relative Humidity, Carbon Monoxide, and Carbon Dioxide

During this visit at all monitored rooms:

The average ambient air temperature was within the ASHRAE criterion range for temperature anticipated to be acceptable for the vast majority of occupants during the winter months.

The average percent relative humidity was consistently measured to be below the recommended range during the monitoring period, although these levels are not uncommon during the winter months. Low percent relative humidity levels can result in dry eyes, sinuses and static electrical discharges.

The average carbon dioxide concentration was maintained within the recommended range. It was not uncommon for CO_2 levels to exceed 1,000 ppm during occupied hours, indicating that an "uncomfortable condition" may have been present, however brief.

No significant carbon monoxide concentration was detected.

Based on these results, the following recommendations are offered:

- Consider monitoring Rooms 137 and 222 and increase the amount of fresh outside air during periods of peak usage.
- Consider ways to increase the level of humidity to within the ASHRAE recommended range (30-60%). This recommendation is tempered by the recognition that humidification systems require routine maintenance and unmaintained systems can result in unwanted mold/bacteria growth and proliferation.

• Airborne Mold Spore Testing

Aspergillus/Penicillium are molds that are commonly associated with the presence of moisture impacted building materials. Aspergillus/Penicillium were detected in both of the outside air samples, offsetting the interpretation of indoor sample results in many instances.

Of the "moisture-related molds" identified, *Aspergillus/Penicillium* (alone) were detected in the following indoor locations:

• Room 225, 109, 110, 125, 124, 103, 149, and 101.

Based on these visits, the following conclusions are reached:

- Molds characteristic of the presence of moisture impacted building materials were detected at several locations within Half Day School.
- In all instances, *Aspergillus/Penicillium* were detected in lower relative proportions to the outside air.

Based on these conclusions, the following recommendations are provided:

- > Ensure that sources of uncontrolled moisture are adequately controlled.
- Inspect areas where Aspergillus/Penicillium were detected for the presence of mold impacted building and remediate in accordance with IDPH/CDC guidelines. (Note that if inspection includes selective demolition, it should be performed in a controlled manner to prevent the unintended spread of molded dusts).
- Remove and replace mold impacted building materials and containerize mold impacted building materials in leak tight containers and discard as construction debris.
- Provide for additional damp cleaning and HEPA vacuuming to clean all surfaces in remediation areas. The goal of the cleaning should be to eliminate all dusts to the extent feasible.
- Provide for informed inspection and independent testing to assess the effectiveness of mold remediation efforts.
- Inform and educate building users to report any instance of uncontrolled water to building authorities as soon as possible. Building authorities should address any report of uncontrolled water as an urgent matter requiring prompt action to control the water and dry/replace any impacted building materials and/or furnishings as needed.

INTRODUCTION

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- 3. To determine whether common air quality parameters were consistent with regulatory and industry standards, and
- 4. to determine whether airborne mold concentrations at select locations within the building were significantly different from those present in the outdoor air.

Indoor air quality monitoring and recording was performed from January 10 – 17, 2018. Non-viable mold air sampling was performed on January 10, 2018.

MEC was represented during the subject visits by Joseph T. Keca, Industrial Hygienist.

SAMPLING METHODOLOGY

• Ambient Temperature, Relative Humidity, Carbon Monoxide, and Carbon Dioxide



A real-time instrument (Velocicalc® Air Velocity Meter Model 9565, manufactured by TSI® Incorporated) was used to measure ambient air temperature, percent relative humidity, carbon monoxide (CO), and carbon dioxide (CO₂) concentrations. This instrument was programmed to collect data over an approximate 1-week time period. Once data collection was completed, the instrument was downloaded to a computer and its output was printed.

• Airborne Mold Spore Sampling



The spore trap air sampling was performed using a high volume air-sampling pump attached to an Air-O-Cell cassette provided by Zefon Corporation containing a tacky substance used to trap mold spores from air on through the method of impaction. For this sampling, pumps operated for approximately five minutes in each location at 15 liters per minute, according to manufacturer's recommendations. The air sampling process impacts particulates (including mold fragments) onto the Air-O-Cell cassette, which is then forwarded to a laboratory for microbial identification.

An independent laboratory (EMSL Analytical, Inc., Hillside, Illinois.) accredited by the American Industrial Hygiene Association (AIHA) was used for all microscopic identification.

EXPOSURE REGULATIONS AND GUIDELINES

• Temperature and Relative Humidity

Temperature and relative humidity are occupant comfort parameters that play an important role in the perceived quality of an indoor work environment. Buildings with large window areas sometimes have acute problems of discomfort due to radiant heat gains and losses. Humidity also has an impact on thermal comfort. Elevated relative humidity levels reduce a person's ability to dissipate heat through perspiration and evaporation. Humidity extremes can also create other IAQ problems. Excessively high or low relative humidity can produce discomfort, while high relative humidity can promote the growth of mold, bacteria, and dust mites, which can aggravate allergies and asthma. Commonly referenced standards for acceptable temperature and relative humidity levels in commercial buildings include:

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 55-2004, entitled "<u>Thermal Environmental Conditions for Human</u> <u>Occupancy</u>." Section 5.2.1.1 of this standard recommends that indoor temperature levels be maintained between approximately 70 – 78 degrees Fahrenheit (°F) for environments with 10 – 20% relative humidity when occupants are wearing heavier clothing typical of the winter season. ASHRAE does not provide a lower humidity limit, and the upper humidity limit is variable depending upon temperature within the space.

The American Industrial Hygiene Association (AIHA) Guideline 2 – 2004, entitled "Recommendations for the Management, Operation, Testing, and Maintenance of HVAC Systems: Maintaining Acceptable Indoor Air Quality in Non-Industrial Employee Occupancies through Dilution Ventilation." Section 7.8 of this standard suggests that 80 – 90% of occupants will be satisfied with a relative humidity between 30 – 60% and temperatures between $68 - 76^{\circ}$ F.

• Carbon Monoxide

Carbon Monoxide (CO) is an odorless, colorless, asphixiant gas that is the product of incomplete combustion. Potential indoor sources include unvented gas heaters, leaking furnaces, gas stoves, automobile exhaust fumes, and environmental tobacco smoke. Concentrations greater than 5 parts per million (ppm) may indicate the presence of exhaust gases in the indoor environment and should be investigated.

At low concentrations, CO can cause fatigue in healthy people and chest pains in people with heart disease. At higher concentrations, CO can cause impaired vision and coordination, headaches, dizziness, confusion and nausea. At very high concentrations, CO can be fatal.

The Occupational Safety and Health Administration (OSHA) has established a permissible exposure limit (PEL) of 50 ppm for CO. Perhaps a more appropriate standard for office environments is specified in Environmental Protection Agency (EPA) National Primary and Secondary Ambient Air Quality Standards (NAAQS), which indicate that CO concentrations should not exceed 9 ppm more than once per year. The U.S. Green Building Council further recommends through its LEED-Commercial Interiors Guideline, that the indoor CO concentration not exceed more than 2 ppm over outdoor concentrations.

• Carbon Dioxide

Carbon dioxide (CO_2) is produced by human metabolism and exhaled through the lungs. CO₂ can serve as a surrogate for measuring the adequacy of ventilation and outside fresh air intake. The OSHA PEL for CO₂ is 5,000 ppm. Normal CO₂ levels for occupied buildings range from 300 to 1,000 ppm. Levels exceeding 1,000 ppm suggest an inadequate rate of ventilation.

RESULTS

• Ambient Temperature, Relative Humidity, Carbon Monoxide, and Carbon Dioxide

The tables below display a summary of the results provided by the Q-Trak monitoring. The tables list the indoor air quality parameters, the average recorded values, as well as the minimum and maximum values recorded.

<u>Room 137</u>

	Air Temperature (°F)	Relative Humidity (%)	CO ₂ (ppm) ¹	CO (ppm) ¹
Average	68.3	24.3	576	0.0
Range	62.6 - 81.8	16.2 - 41.1	395 - 2,245	0.0 - 0.2

Room 222

	Air Temperature (°F)	Relative Humidity (%)	CO ₂ (ppm) ¹	CO (ppm) ¹
Average	71.4	22.3	484	0.0
Range	68.1 - 75.2	16.1 - 39.8	371 - 1,124	0.0 - 0.0

¹ppm = parts per million

Graphs and statistics regarding the Q-Trak monitoring is provided in Appendix 1.

• Airborne Mold Spore Results

The tables below display the results of the airborne mold spore sampling. The tables display the sample ID number, sampled location, types of spores detected, their concentration, and their percent of the total spores detected in the respective sample.

Sample ID Number	Sampled Location	Type of Mold Detected	Concentration (counts/m ³)	Percent of the Total Molds
2492-7624	Outside Air at	Aspergillus/Penicillium	<mark>30</mark>	<mark>42.9</mark>
	Main Entrance	Basidiospores	40	57.1
2492-5743	Room 222	Cladosporium	10	100.0
2492-5801	Room 222A	None Detect		
2492-5759	Room 226	Cladosporium	40	57.1
		Unidentifiable Spores	30	42.9
2492-5751	Room 225	Aspergillus/Penicillium	40 40	15.4
		Basidiospores	40	15.4
		Cladosporium	100	38.5
		Epicoccum	30	11.5
		Kusi	10	3.0 15.4
2402 5757	Doom 214		40	50.0
2492-5757	R0011 2 14	Epicoccum	40	50.0
2402 5929	Poom 212	Cladosporium	40	14.2
2492-0000		Eniopopulm	40	14.3
		Epicoccum	40	74.3
0.400.0005	Dears 045		200	100.0
2492-6085	Room 215	Epicoccum	40	100.0
2492-7651	Room 213		10	20.0
	.	Unidentifiable Spores	40	80.0
2492-5803	Room 111	Cladosporium	80	50.0
		Epicoccum	40	25.0
		Unidentifiable Spores	40	25.0
2492-6010	Room 109	Alternaria	40	16.0
		Aspergillus/Penicillium	<mark>40</mark>	<mark>16.0</mark>
		Cladosporium	40	16.0
		Pithomyces	10	4.0
		Rust	40	16.0
		Scopulariopsis	40	16.0
		Unidentifiable Spores	40	16.0

2492-7631	Room 110	Aspergillus/Penicillium	<mark>40</mark>	<mark>21.1</mark>
		Cladosporium	40	21.1
		Pithomyces	30	15.8
		Rust	80	42.1
2492-7646	Room 108	Cladosporium	40	80.0
		Ulocladium	10	20.0
2492-7644	Multi-Purpose	Alternaria	10	1.2
	Room 125	Aspergillus/Penicillium	<mark>40</mark>	<mark>4.7</mark>
		Cladosporium	300	34.9
		Curvularia	10	1.2
		Epicoccum	30	3.5
		Ganoderma	80	9.3
		Rust	40	4.7
		Scopulariopsis	40	4.7
		Unidentifiable Spores	300	34.9
		Nigrospora	10	1.2
2492-6080	Multi-Purpose	Aspergillus/Penicillium	<mark>80</mark>	<mark>50.0</mark>
	Room 124	Cladosporium	40	25.0
		Rust	40	25.0
2492-5739	Room 102	Cladosporium	40	28.6
	Staff Lounge	Epicoccum	10	7.1
		Ganoderma	40	28.6
		Myxomycetes	10	7.1
		Unidentifiable Spores	40	28.6
2492-7621	Room 103	Aspergillus/Penicillium	<mark>40</mark>	<mark>8.0</mark>
	Nurse's Office	Cladosporium	40	8.0
		Pithomyces	80	16.0
		Rust	40	8.0
		Unidentifiable Spores	300	60.0
2492-7638	Room 129 -	Alternaria	10	11.1
	Learning	Pithomyces	40	44.4
	Center	Unidentifiable Spores	40	44.4
2492-6152	Room 131	Unidentifiable Spores	10	100.0
2492-7627	Room 130	None Detect		
2492-7661	Room 134	Cladosporium	10	11.1
		Unidentifiable Spores	80	88.9
2492-7619	Room 138	Unidentifiable Spores	40	100.0

2492-5738	Room 139	Cladosporium	80	88.9
		Unidentifiable Spores	10	11.1
2492-6054	Room 136	Alternaria	40	100.0
2492-7647	Room 137	None Detect		
2492-7630	Room 135	Unidentifiable Spores	80	100.0
2492-5760	Room 133	Myxomycetes	40	28.6
		Rust	10	7.1
		Ulocladium	10	7.1
		Unidentifiable Spores	80	57.1
2492-6057	Room 145	None Detect		
2492-7623	Room 147	None Detect		
2492-6179	Room 146	None Detect		
2492-7625	Room 144	Epicoccum	10	16.7
		Myxomycetes	10	16.7
		Unidentifiable Spores	40	66.7
2492-5997	Room 150	Myxomycetes	40	33.3
		Unidentifiable Spores	80	66.7
2492-5826	Room 149	Alternaria	40	4.9
		Ascospores	40	4.9
		Aspergillus/Penicillium	<mark>200</mark>	<mark>24.4</mark>
		Basidiospores	40	4.9
		Cladosporium	200	24.4
		Epicoccum	40	4.9
		Ganoderma	40	4.9
		Myxomycetes	80	9.8
		Pithomyces	40	4.9
		Unidentifiable Spores	100	12.2
2492-7665	Room 152	None Detect		
2492-7657	Room 101 -	Ascospores	10	2.2
	Principal's	Aspergillus/Penicillium	<mark>200</mark>	<mark>44.4</mark>
	Office	Cladosporium	40	8.9
		Unidentifiable Spores	200	44.4
2492-7636	Outside Air at	Ascospores	460	32.6
	Main Entrance	Aspergillus/Penicillium	<mark>460</mark>	<mark>32.6</mark>
		Basidiospores	420	29.8
		Myxomycetes	70	5.0

Aspergillus/Penicillium are molds that are commonly associated with the presence of moisture impacted building materials. Aspergillus/Penicillium were detected in both of the outside air samples, offsetting the interpretation of indoor sample results in many instances.

Of the "moisture-related molds" identified, *Aspergillus/Penicillium* (alone) were detected in the following indoor locations:

• Room 225, 109, 110, 125, 124, 103, 149, and 101.

In all instances, *Aspergillus/Penicillium* were detected in lower relative proportions to the outside air.

A copy of the laboratory analysis report for these samples is provided in Appendix 2. Photographs of the samples areas are provided in Appendix 3. Drawings showing the approximate sampled locations are provided in Appendix 4.

CONCLUSIONS AND RECOMMENDATIONS

• Ambient Temperature, Relative Humidity, Carbon Monoxide, and Carbon Dioxide

During this visit at all monitored rooms:

The average ambient air temperature was within the ASHRAE criterion range for temperature anticipated to be acceptable for the vast majority of occupants during the winter months.

The average percent relative humidity was consistently measured to be below the recommended range during the monitoring period, although these levels are not uncommon during the winter months. Low percent relative humidity levels can result in dry eyes, sinuses and static electrical discharges.

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- Consider monitoring Rooms 137 and 222 and increase the amount of fresh outside air during periods of peak usage.
- Consider ways to increase the level of humidity to within the ASHRAE recommended range (30-60%). This recommendation is tempered by the recognition that humidification systems require routine maintenance and unmaintained systems can result in unwanted mold/bacteria growth and proliferation.

• Airborne Mold Spore Testing

There is no uniformity in the suggested guidelines for acceptable levels of molds in indoor ambient air. Thus, health professionals have no way to determine what levels of molds may pose a threat to human health.

According to the American Conference of Governmental Industrial Hygienists (ACGIH), an independent source of molds likely exists indoors when either of the following conditions exists:

- There is a significantly greater concentration of molds present indoors compared with outdoors (barring a heavy snow covering or rainfall), or
- The types of molds present indoors are significantly different than the types of molds present outdoors.

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- > Ensure that sources of uncontrolled moisture are adequately controlled.
- Inspect areas where Aspergillus/Penicillium were detected for the presence of mold impacted building and remediate in accordance with IDPH/CDC guidelines. (Note that if inspection includes selective demolition, it should be performed in a controlled manner to prevent the unintended spread of molded dusts).
- Remove and replace mold impacted building materials and containerize mold impacted building materials in leak tight containers and discard as construction debris.
- Provide for additional damp cleaning and HEPA vacuuming to clean all surfaces in remediation areas. The goal of the cleaning should be to eliminate all dusts to the extent feasible.
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Inform and educate building users to report any instance of uncontrolled water to building authorities as soon as possible. Building authorities should address any report of uncontrolled water as an urgent matter requiring prompt action to control the water and dry/replace any impacted building materials and/or furnishings as needed.

Respectfully submitted,

Then

Jøseph Keca (630) 553-3989 Midwest Environmental Consulting Services, Inc. 4 Bonnie Lane Yorkville, IL 60560

Appendices (4)

- 1. Q-Trak Graphs and Statistics
- 2. Laboratory Analysis Reports
- 3. Photographs
- 4. Drawings with Sample Locations



Graph Statistics Room 137									
	CO2	т	Н	СО					
Avg	576 ppm	68.3 deg F	24.3 %rh	0.0 ppm					
Max	2245 ppm	81.8 deg F	41.1 %rh	0.2 ppm					
Max Date	01/12/2018	01/17/2018	01/11/2018	01/10/2018					
Max Time	15:59:21	07:29:01	14:04:25	11:19:30					
Min	395 ppm	62.6 deg F	16.2 %rh	0.0 ppm					
Min Date	01/15/2018	01/13/2018	01/17/2018	01/10/2018					
Min Time	18:44:07	04:34:18	10:04:01	11:59:29					
TWA (8 hr)	1120			0.0					
TWA Start Date	01/10/2018			01/10/2018					
TWA Start Time	11:14:30			11:14:30					
TWA End Time	10:09:01			10:09:01					



Graph Statistics Room 222									
	CO2	т	Н	CO					
Avg	484 ppm	71.4 deg F	22.3 %rh	0.0 ppm					
Max	1124 ppm	75.2 deg F	39.8 %rh	0.0 ppm					
Max Date	01/16/2018	01/16/2018	01/11/2018	01/10/2018					
Max Time	13:53:26	15:13:26	16:28:29	11:28:29					
Min	371 ppm	68.1 deg F	16.1 %rh	0.0 ppm					
Min Date	01/11/2018	01/14/2018	01/16/2018	01/10/2018					
Min Time	06:48:29	07:58:28	08:28:27	11:33:29					
TWA (8 hr)	600			0.0					
TWA Start Date	01/10/2018			01/10/2018					
TWA Start Time	11:23:29			11:23:29					
TWA End Time	10:03:26			10:03:26					

	APPENDIX 2 <u>Laboratory Analysis Reports</u> Half Day School LincoInshire, Illinois January 10, 2018									
EMSI 4140 Litt D Tel/Fax: (7 http://www	EMSL Analytical, Inc. 4140 Litt Drive Hillside, IL 60162 Tel/Fax: (773) 313-0099 / (773) 313-0139 http://www.EMSL.com / chicagolab@emsl.com									
Attn: Joseph Midwesi 4 Bonni Yorkville Project: 17-12-9	Attn: Joseph Keca Phone: (630) 636-8918 Midwest Environmental Consulting Svs. Fax: (630) 553-3990 4 Bonnie Lane Collected: 01/10/2018 Yorkville, IL 60560 Received: 01/10/2018 Project: 17-12-968-IH/Half-Day School, Lincolnshire, IL 01/15/2018 - 01/16/2018							16/2018		
Test Rep Lab Sample Number: Client Sample ID: Volume (L): Sample Location	ort: Air-O-Cell(" Outsid	*) Analysis of F 261800292-000 2492-7624 75 e Air/@ Main Er	ungal Spores & I htrance	Particulates by	Optical Micro 261800292-00 2492-5743 75 Room 222	oscopy (Methods I 002	EMSL 05-TP	2-003, A STM D7391) 261800292-000 2492-5801 75 Room 222A	3	
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Cou	unt Count/m³	% of Total	
Alternaria	-	-	-	-	-	-	-	-	-	
Ascospores	-	-	-							
Aspergillus/Penicillum Basidiospores	2* 1	30° 40	42.9	-		-	-	-		
Bipolaris++	-	40	J/.1					-		
Chaetomium			-							
Cladosporium		-	-	1*	10*	100	-	-		
Curvularia			-	-	-		-	-	•	
Epicoccum	-	-	-	-	-	-	-	-	•	
Fusarium			-				-	-		
Ganoderma	-	-	-	-	-	-		-	•	
Myxomycetes++ Pithomyces	•	•	•	-	•	-	-	-	-	

Rust

Torula

Scopulariopsis

Stachybotrys

Ulocladium

Zygomycetes

Nigrospora

Total Fungi

Pollen

Hyphal Fragment

Insect Fragment

Analyt. Sensitivity 600x

Analyt. Sensitivity 300x

Fibrous Particulate (1-4)

Skin Fragments (1-4)

Background (1-5)

Unidentifiable Spores

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4140 Litt Drive Hillside, IL 60162 Tel/Fax: (773) 313-0099 / (773) 313-0139 http://www.EMSL.com / chicagolab@emsl.com

Attn: Joseph Keca

Midwest Environmental Consulting Svs. 4 Bonnie Lane Yorkville, IL 60560 EMSL Order: 261800292 Customer ID: MECO77 Customer PO: Project ID:

 Phone:
 (630) 636-8918

 Fax:
 (630) 553-3990

 Collected:
 01/10/2018

 Received:
 01/10/2018

 Analyzed:
 01/15/2018 - 01/16/2018

Project: 17-12-968-IH/Half-Day School, Lincolnshire, IL

Test Repo	ort: Air-O-Cell(™	Analysis of F	ungal Spores &	Particulates by	Optical Microso	copy (Methods I	EMSL 05-TP-003	, ASTM D7391)	
Lab Sample Number: Client Sample ID: Volume (L): Sample Location		261800292-000 2492-5759 75 Room 226	l		261800292-0005 2492-5751 75 Room 225	j		261800292-0006 2492-5757 75 Room 214	
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria	-	-	-	- '	-	-	-	-	-
Ascospores	-	-	-	-		-	-	-	-
Aspergillus/Penicillium	-	-	-	1	40	15.4	-	-	-
Basidiospores	-	-	-	1	40	15.4	-	-	-
Bipolaris++	-	-	-	-		-	-	-	-
Chaetomium	-	-	-			-	-	-	
Cladosporium	1	40	57.1	3	100	38.5	-	-	•
Curvularia	-		-			-	-	-	
Epicoccum			-	2*	30*	11.5	1	40	50
Fusarium									
Ganoderma		-	-			-	-	-	-
Myxomycetes++	-	-	-	-		-	-	-	
Pithomyces		-	-			-			-
Rust	-	-	-	1*	10*	3.8	-	-	
Scopulariopsis	-	-	-	-		-	-	-	-
Stachybotrys	-	-	-			-	-	-	
Torula			-			-	-	-	
Ulocladium			-				-	-	
Unidentifiable Spores	2*	30*	42.9	3*	40*	15.4	1	40	50
Zygomycetes	•			•					
Nigrospora						-			
Total Fungi	3	70	100	11	260	100	2	80	100
Hyphal Fragment	1*	10*	-	1	40	-	2	80	-
Insect Fragment	-		-	-		-	-	-	
Pollen	-	-	-	-		-	-	-	-
Analyt. Sensitivity 600x	-	42			42			42	
Analyt. Sensitivity 300x	-	13*	-		13*	-	-	13*	-
Skin Fragments (1-4)		3	-		3	-	-	2	
Fibrous Particulate (1-4)	-	2	-		1	-	-	1	-
Background (1-5)	-	1	-	-	2	-	-	1	

	Analyt	ical In	•			EMSL	Order: 2618	300292	
	- Analyt	lical, inc				Custor	ner ID: MEC	077	
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Widwest		tai Consulun	iy ovs.				Fax: (050	1) 000-0000	
4 Bonnie	e Lane					Coll	ected: 01/1	0/2018	
Yorkville	, IL 60560					Rec	eived: 01/1	0/2018	
						Ana	lvzed: 01/1	5/2018 - 01/	16/2018
Project: 17-12-90	68-IH/Half-Da	ay School, Li	incolnshire, IL				. ,		
Test Repo	ort: Air-O-Cell("	Maintain Analysis of F	⁻ ungal Spores &	Particulates by	Optical Microso	opy (Methods 8	EM SL 05-TP-003	, ASTM D7391)	
Lab Sample Number:		261800292-000	7		261800292-0008			261800292-000	9
Client Sample ID:		2492-5838			2492-6085			2492-7651	
Volume (L):		75			75			75	
Sample Location		Room 212			Room 215			Room 213	
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	•	-	-	•	-	-	-	•
Aspergillus/Penicillium	-	•	•		•	-		-	•
Basidiospores	•	•						•	•
Bipolaris++	-	•	•		•	-		-	•
Chaetomium	-	-	-				-	-	•
Cladosporium	1	40	14.3	-	•	-	1*	10*	20
Curvularia	-	-	-	-	-	-	-	•	·
Epicoccum	1	40	14.3	1	40	100	-	-	•
Fusarium	•	•	•	•	•	•	•	•	·
Ganoderma	-	•	•	-	•	-	-	-	•
Myxomycetes++	•	•	•	•			•	•	•
Pitnomyces	-	•	•	-	•	-	-	-	-
Rust	-							-	
Scopulariopsis	-	•	•		•	•	-	•	•
Stacnybotrys	-					-	-	-	
Indua	-		•	-	•	-	-	-	
Ulociadium	-	-	- 74.4				-	-	-
Zucomunation	4	200	/ 1.4		•	-	1	40	00
Zygomycetes	-							•	
Total Europi		-	400		-	-	-	-	400
Total Fungi	0	280	100	1	40	100	2	50	100
Insect Fragment	Э	200		2	oU	•	•	•	•
Dollan	-			1*	10*	-			
Analyt Sensitivity 600y	-	42			42			42	
Analyt. Sensitivity 200x	-	42			12*	•		42 12*	•
Skin Fragments (1.4)		3			3			2	
Citarus Dadiaulata (1-4)		1			1			- 1	
FIDROUS Particulate (1-4)			-			-			_



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 01/10/2018

 Analyzed:
 01/15/2018 - 01/16/2018

Project: 17-12-968-IH/Half-Day School, Lincolnshire, IL

Test Rep	ort: Air-O-Cell(†	Manalysis of F	ungal Spores &	Particulates by	Optical Microso	opy (Methods B	EMSL 05-TP-003	, ASTM D7391)	
Lab Sample Number: Client Sample ID: Volume (L): Sample Location		261800292-0010 2492-5803 75 Room 111)		261800292-0011 2492-6010 75 Room 109			261800292-0012 2492-7631 75 Room 110	2
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria	-	-	-	1	40	16	-	-	-
Ascospores	-		-	-		-	-		-
Aspergillus/Penicillium		•		1	40	16	1	40	21.1
Basidiospores	-		-			-	-		
Bipolaris++	-					-	-		-
Chaetomium	-	-	-				-		
Cladosporium	2	80	50	1	40	16	1	40	21.1
Curvularia	-	-	-			-	-		
Epicoccum	1	40	25				-		
Fusarium	-		-				-		
Ganoderma		•	-				-		
Myxomycetes++			-				-		
Pithomyces	-		-	1*	10*	4	2*	30*	15.8
Rust				1	40	16	2	80	42.1
Scopulariopsis				1	40	16			
Stachybotrys	-		-			-	-		
Torula									
Ulocladium									
Unidentifiable Spores	1	40	25	1	40	16	-		-
Zygomycetes							-		
Nigrospora							-		
Total Fungi	4	160	100	7	250	100	6	190	100
Hyphal Fragment	2	80		4	200		5	200	•
Insect Fragment							-		
Pollen	-	-	-			-	-		-
Analyt. Sensitivity 600x		42			42			42	
Analyt. Sensitivity 300x		13*			13*			13*	
Skin Fragments (1-4)	-	3	-		2	-	-	3	
Fibrous Particulate (1-4)		1			1	-	-	1	
Background (1-5)	-	2	-	-	3	-	-	2	-



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Project: 17-12-968-IH/Half-Day School, Lincolnshire, IL

Test Report: Air-O-Cell(1*) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)										
Lab Sample Number:		261800292-0013	3		261800292-0014	4		261800292-0015	i	
Client Sample ID:	2492-7646				2492-7644			2492-6080		
Volume (L):		75			75			75		
Sample Location		Room 108		Multi	-Purpose Roon	n 125	Multi-Purpose Room 124			
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	
Alternaria	-	-	-	1*	10*	1.2	-	-	-	
Ascospores				· ·		-	-		-	
Aspergillus/Penicillium			•	1	40	4.7	2	80	50	
Basidiospores		-	-			•	-		-	
Bipolaris++		-			-	•	-	-	-	
Chaetomium		-					-		-	
Cladosporium	3*	40*	80	6	300	34.9	1	40	25	
Curvularia		-	-	1*	10*	1.2	-		-	
Epicoccum		-		2*	30*	3.5	-	-	-	
Fusarium		-	-	-	-		-	-	-	
Ganoderma	-	-	-	2	80	9.3	-	-	-	
Myxomycetes++		-	-	-	-		-	-	-	
Pithomyces		-					-		-	
Rust		-	-	1	40	4.7	1	40	25	
Scopulariopsis				1	40	4.7	-			
Stachybotrys							-			
Torula		-							-	
Ulocladium	1*	10*	20				-			
Unidentifiable Spores		-		6	300	34.9	-		-	
Zygomycetes				•		•				
Nigrospora				1*	10*	1.2				
Total Fungi	4	50	100	22	860	100	4	160	100	
Hyphal Fragment	2	80		15	620		4	200	-	
Insect Fragment	•			•						
Pollen							-			
Analyt. Sensitivity 600x		42			42			42		
Analyt. Sensitivity 300x		13*			13*		-	13*	-	
Skin Fragments (1-4)		3	-		4			3		
Fibrous Particulate (1-4)		1	-		1			1	-	
Background (1-5)	-	2	-	-	4	-	-	2		



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 Analyzed:
 01/15/2018 - 01/16/2018

Project: 17-12-968-IH/Half-Day School, Lincolnshire, IL

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)									
Lab Sample Number: Client Sample ID: Volume (L): Sample Location	261800292-0016 2492-5739 75 Room 102 Staff Lounge			261800292-0017 2492-7621 75 Room 103 Nurses' Office			261800292-0018 2492-7638 75 Room 129 Learning Resource Center		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria	-	-	-	-	-	-	1*	10*	11.1
Ascospores	-					-			
Aspergillus/Penicillium	-			1	40	8			
Basidiospores	-					-			
Bipolaris++									
Chaetomium									
Cladosporium	1	40	28.6	1	40	8			•
Curvularia									
Epicoccum	1*	10*	7.1	-		-			
Fusarium									
Ganoderma	1	40	28.6	-		-		-	
Myxomycetes++	1*	10*	7.1	-		-			
Pithomyces	-			2	80	16	1	40	44.4
Rust	-			1	40	8			
Scopulariopsis				-		-			
Stachybotrys	-								
Torula						-			
Ulocladium									
Unidentifiable Spores	1	40	28.6	6	300	60	1	40	44.4
Zygomycetes						-			
Nigrospora						-			
Total Fungi	5	140	100	11	500	100	3	90	100
Hyphal Fragment	1	40		4	200		5	200	•
Insect Fragment									
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	42			42			42	
Analyt. Sensitivity 300x		13*			13*	-		13*	
Skin Fragments (1-4)	-	3	-		3	-		3	
Fibrous Particulate (1-4)	-	1	-	-	1	-		1	-
Background (1-5)	-	2	-	-	2	-		2	



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Project: 17-12-968-IH/Half-Day School, Lincolnshire, IL

Test Rep	Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)								
Lab Sample Number: Client Sample ID: Volume (L): Sample Location	261800292-0019 2492-6152 75 Room 131			261800292-0020 2492-7627 75 Room 130			261800292-0021 2492-7661 75 Room 134		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria	-	-	-	-	- 1	-	-	-	-
Ascospores	-	-			-				
Aspergillus/Penicillium	-	-	•					•	-
Basidiospores	-	-				-			-
Bipolaris++		-				-		-	-
Chaetomium	-								
Cladosporium	-						1*	10*	11.1
Curvularia	-								
Epicoccum	-						-		-
Fusarium	-			-			-		-
Ganoderma	-								-
Myxomycetes++	-								
Pithomyces	-								-
Rust	-			-					-
Scopulariopsis	-								-
Stachybotrys	-								-
Torula	-								-
Ulocladium	-								-
Unidentifiable Spores	1*	10*	100				2	80	88.9
Zygomycetes	-								
Nigrospora	-								-
Total Fungi	1	10	100		None Detect		3	90	100
Hyphal Fragment	1	40		2	80		1	40	-
Insect Fragment	-			-			-		-
Pollen	-	-			-		-		-
Analyt. Sensitivity 600x	-	42			42			42	-
Analyt. Sensitivity 300x	-	13*			13*			13*	-
Skin Fragments (1-4)	-	1	-	-	3	-	-	3	-
Fibrous Particulate (1-4)	-	1			1			1	-
Background (1-5)	-	1	-		2	-	-	1	



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Project: 17-12-968-IH/Half-Day School, Lincolnshire, IL

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location		261800292-002 2492-7619 75 Room 138	2	261800292-0023 2492-5738 75 Room 139			261800292-0024 2492-6054 75 Room 136		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria						-	1	40	100
Ascospores									1.1
Aspergillus/Penicillium									1.1
Basidiospores									1.1
Bipolaris++									1.1
Chaetomium									1.1
Cladosporium				2	80	88.9	•		1.1
Curvularia									1.1
Epicoccum									1.1
Fusarium									
Ganoderma				•			•		1.1
Myxomycetes++									
Pithomyces									1.1
Rust									
Scopulariopsis									1.1
Stachybotrys			•						1.1
Torula									1.1
Ulocladium									
Unidentifiable Spores	1	40	100	1*	10*	11.1			1.1
Zygomycetes									1.1
Nigrospora									1.1
Total Fungi	1	40	100	3	90	100	1	40	100
Hyphal Fragment				2	80		2	80	1.1
Insect Fragment									1.1
Pollen									1.1
Analyt. Sensitivity 600x		42			42			42	1.1
Analyt. Sensitivity 300x		13*			13*			13*	1.1
Skin Fragments (1-4)	1.1	2			2			3	1.1
Fibrous Particulate (1-4)		1			1	1.1		1	1.1
Background (1-5)		1			1			1	



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Project: 17-12-968-IH/Half-Day School, Lincolnshire, IL

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location		261800292-0025 261800292-0026 261800292-0027 2492-7647 2492-7630 2492-5760 75 75 75 Room 137 Room 135 Room 133			261800292-0026 2492-7630 75 Room 135			,	
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria	-	-		-	-	-	-	-	-
Ascospores	•					-	-		
Aspergillus/Penicillium						-			
Basidiospores									
Bipolaris++						-			-
Chaetomium		-				-			
Cladosporium	-	-				-	-	-	-
Curvularia		-		-		-	-	-	-
Epicoccum	•	-				-	-	-	-
Fusarium				-			-		-
Ganoderma		•				-			-
Myxomycetes++		-		-		-	1	40	28.6
Pithomyces		-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	1*	10*	7.1
Scopulariopsis		-	-	-	-	-	-	-	-
Stachybotrys				-		-	-	-	-
Torula						-			-
Ulocladium				-		-	1*	10*	7.1
Unidentifiable Spores	•			2	80	100	2	80	57.1
Zygomycetes		-		-		-	-	-	-
Nigrospora						-	-	-	-
Total Fungi	-	None Detect	-	2	80	100	5	140	100
Hyphal Fragment	2	80		1	40	-	4	200	-
Insect Fragment						-	-	-	-
Pollen									
Analyt. Sensitivity 600x		42		-	42	-		42	-
Analyt. Sensitivity 300x		13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	3	-
Fibrous Particulate (1-4)		1	-		1	-	-	1	-
Background (1-5)		1		-	1			2	



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Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	261800292-0028				261800292-0029 2492-7623			261800292-0030 2492-6179		
Volume (L):		75			75		75			
Sample Location		Room 145			Room 147			Room 146		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	
Alternaria	•	•	•	•	-	•		•	•	
Ascospores	•	•	•	•	•	•	•	•	•	
Aspergillus/Penicillium	-	•	•	•	•	•		•	•	
Basidiospores	•	•	•	•	•	•	•	•	· ·	
Bipolaris++		•	•	•	•	•	•	-	•	
Chaetomium										
Cladosporium	•		•	•	•	•	•	-	•	
Curvularia										
Epicoccum				•						
Fusarium				•				-		
Ganoderma		•		•	•			•		
Myxomycetes++										
Pithomyces								-		
Rust		-								
Scopulariopsis										
Stachybotrys		-								
Torula										
Ulocladium										
Unidentifiable Spores								-		
Zygomycetes			•						•	
Nigrospora										
Total Fungi		None Detect			None Detect			None Detect		
Hyphal Fragment	1*	10*						-		
Insect Fragment			•			•			•	
Pollen	-	-			-		-	-	-	
Analyt. Sensitivity 600x	-	42	-	-	42	-	-	42	-	
Analyt. Sensitivity 300x	-	13*			13*	-	-	13*	-	
Skin Fragments (1-4)	-	2	-		2	-	-	1	-	
Fibrous Particulate (1-4)	-	1			1	-	-	1	-	
Background (1-5)	-	1	-	-	1	-	-	1	-	



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Project: 17-12-968-IH/Half-Day School, Lincolnshire, IL

Midwest Environmental Consulting Svs.

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391) 261800292-0031 261800292-0032 261800292-0033 Lab Sample Number: 2492-7625 2492-5997 2492-5826 Client Sample ID: Volume (L): 75 75 75 Room 144 Room 150 Room 149 Sample Location % of Total Spore Types Raw Count Count/m³ % of Total Raw Count Count/m³ % of Total Raw Count Count/m³ Alternaria 40 4.9 -1 --Ascospores 40 4.9 1 ------Aspergillus/Penicillium 200 24.4 4 --Basidiospores 1 40 4.9 ------Bipolaris++ -. . -. Chaetomium ---------Cladosporium 5 200 24.4 Curvularia ---------Epicoccum 1* 10* 16.7 1 40 4.9 Fusarium ---------Ganoderma 40 4.9 -1 -----Myxomycetes++ 1* 10* 40 33.3 2 80 9.8 16.7 1 Pithomyces 40 4.9 1 --Rust ---------Scopulariopsis Stachybotrys ---------Torula . . Ulocladium ---------Unidentifiable Spores 40 80 66.7 100 1 66.7 2 3 12.2 Zygomycetes ---------Nigrospora -----. Total Fungi 3 60 100 3 120 100 20 820 100 Hyphal Fragment 5* --70* 4 200 . -Insect Fragment --------Pollen 1* 10* Analyt. Sensitivity 600x 42 42 42 ------Analyt. Sensitivity 300x 13* 13* 13* --Skin Fragments (1-4) 2 3 3 ------Fibrous Particulate (1-4) 1 1 1 . . Background (1-5) 2 2 3 ------



EMSL Analytical, Inc. 4140 Litt Drive Hillside, IL 60162 Tel/Fax: (773) 313-0099 / (773) 313-0139

EMSL Order: 261800292 Customer ID: MECO77 Customer PO: Project ID:

Attn: Joseph Keca	Phone: (630) 636-8918
Midwest Environmental Consulting Svs.	Fax: (630) 553-3990
4 Bonnie Lane	Collected: 01/10/2018
Yorkville, IL 60560	Received: 01/10/2018
	Analyzed: 01/15/2018 - 01/16/2018

Project: 17-12-968-IH/Half-Day School, Lincolnshire, IL

Test Rep	port: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)									
Lab Sample Number: Client Sample ID: Volume (L): Sample Location		261800292-0034 2492-7665 75 Room 152	l	Princi	261800292-0035 2492-7657 75 Principal's Office Room 101 Outsid			261800292-0036 2492-7636 75 Outside Air/@ Main Entrance		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	
Alternaria	-	-	-		-	-	-	-	-	
Ascospores			-	1*	10*	2.2	11	460	32.6	
Aspergillus/Penicillium	-		-	4	200	44.4	11	460	32.6	
Basidiospores		-	-		-		10	420	29.8	
Bipolaris++							-	-	-	
Chaetomium			-		-		-	-	-	
Cladosporium			-	1	40	8.9	-	-	-	
Curvularia		-					-	-	-	
Epicoccum	-		-				-	-	-	
Fusarium		-	-	· ·			-	-	-	
Ganoderma			-				-	-	-	
Myxomycetes++	-	-	-	· ·	-		5*	70*	5	
Pithomyces			-				-	-	-	
Rust	-	-	-		-		-	-	-	
Scopulariopsis	-		-				-	-	-	
Stachybotrys			-				-	-	-	
Torula	•		-	· ·			-	-	-	
Ulocladium	-	-	-	· ·	-	-	-	-	-	
Unidentifiable Spores			-	4	200	44.4	-	-	-	
Zygomycetes		-	-		-	-	-	-	-	
Nigrospora	-		-	· ·			-	-	-	
Total Fungi	-	None Detect	-	10	450	100	37	1410	100	
Hyphal Fragment	•		-	1*	10*		1*	10*		
Insect Fragment		-	-		-		-	-		
Pollen				1	40					
Analyt. Sensitivity 600x		42	-		42			42		
Analyt. Sensitivity 300x		13*	-		13*		-	13*	-	
Skin Fragments (1-4)		2	-		2			1		
Fibrous Particulate (1-4)		1	-		1			1	-	
Background (1-5)		1	-	·	1	-	-	1	-	



Performed for: LINCOLNSHIRE-PRAIRIE VIEW SCHOOL DISTRICT #103 1370 N. Riverwoods Road Lincolnshire, IL 60069 MEC Project #: 17-12-968-I.H.









