



Environmental Hygiene Report

Submitted to: Mr. John Willabay
 Director of Facilities

Poughkeepsie City School District

Prepared by: Brian Colandrea, Safety and Risk Coordinator

Location	Y cttlpi 'Grgo gpvct {
Project No.	029-1819
Site Visits	Qevqdg't6, 2018
Report Date	October 37, 2018
Investigator	Brian Colandrea CMA #01300

This survey is strictly limited to that which is identified in the Project Scope of the report. Dutchess County BOCES Health, Safety & Risk Management does not assert that all potential health or safety hazards at this site were evaluated during this investigation.

Dutchess County Board of Cooperative Educational Services

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Author's Note: Parenthetical numerals at the end of a sentence reference the work with the corresponding notation in the **References** section. *Please read this report in its entirety, including any attached appendices, to fully understand this investigation.*

Executive Summary

On October 3, 2018 the Facilities Department for the Poughkeepsie City School District requested that our office perform an indoor air quality (IAQ) investigation in the Warring (Rooms 22 , Library, and OT-PT room) Elementary School. On October 4, 2018 we performed a visual inspection of the areas in question as well as Room 24 (the teacher of Room 24 requested an inspection while we were there). Air samples were taken in Room 22, the Library and an outdoor comparison sample for airborne fungal spores. Results of the visual inspections in the OT-PT room showed fungal growth in an unplugged refrigerator growing on food stuffs left in the refrigerator. Results of the visual inspections and air sampling for fungal spores (see **Results Summary**) in Rooms 22, 24, and the Library showed nothing of concern.

Project Scope

Perform visual inspections of the OT-PT Room, Rooms 22 and Library of the Warring Elementary School. Take air samples looking for fungal spores in both locations. Review the data and prepare a written report for the Poughkeepsie City School District.

Materials & Methods

Air sampling for fungal spores was performed using a Zefon, Bio-Pump Plus calibrated to 15 liters per minute (LPM), each sample was collected for 6 minutes. Each sample was collected on a Zefon Air-O-Cell cassette. The samples, once collected were then packaged and delivered via UPS to Aerobiology Laboratory Associates Inc., (AIHA-LAP EMLAP# 102747) located in Pennsauken, New Jersey for analysis. All inspections were performed and samples collected by a NYS Certified Mold Assessor (Cert # MA01300).

Results Summary

All sample results and other data were reported to the administration of the local educational agency (LEA) via phone, fax, or e-mail as they became available to our department.

Warring Elementary Air Samples

(see Appendix for full Laboratory Results)

Sample ID	Sample Location	Spore Identification in spr/m ^{3*}
10418-WE1	Room 222	ascospores- 133 basidiospores- 4178 Cladosporium- 22 Curvularia- 11 Drechslera/Bipolaris group- 11 hyphal elements- 67 Pithomyces- 11 Rusts- 56 Smuts, Periconia, Myxomycetes- 22
10418-WE2	Library	ascospores- 178 basidiospores- 900 Cladosporium- 256 Drechslera/Bipolaris group- 11 hyphal elements- 33 Penicillium/Aspergillus group- 278 Rusts- 56 Scopulariopsis- 44 Smuts, Periconia, Myxomycetes- 133
10418-WE3	Outdoor Comparison	Alternaria- 11 ascospores- 511 basidiospores- 5822 Cercospora- 11 Cladosporium- 900 Curvularia- 22 hyphal elements- 22 Penicillium/Aspergillus group- 67 Pyricularia- 22 Rusts- 11 Smuts, Periconia, Myxomycetes- 256

*spores per meter cubed

Surface Sampling of Observed Fungal Growth

Sample ID	Sample Location	Results
10418-WE4	OT-PT Room, Refrigerator	Moderate hyphae seen Numerous Penicillium spores seen Numerous Penicillium hyphae seen Numerous Penicillium conidiophores seen

Discussion

The National Institute for Occupational Safety & Health (NIOSH), a division of the Center for Disease Control, uses the term Indoor Environmental Quality (IEQ) to describe the perception of the indoor environment by occupants of non-industrial facilities like offices and schools. Occupants of these facilities frequently report a variety of physical symptoms (e.g. headache, fatigue, eye & skin irritation) that they attribute to poor indoor air. If air is the culprit, there may be a number of causes, including chemical, physical, and biological contamination. These contaminants can create odors, cause occupant discomfort, and, occasionally, create a health hazard. Frequently the cause of poor indoor air quality is inadequate or poorly modulated ventilation. This can result in uneven heating and cooling (which can affect the comfort of building occupants) and the provision of inadequate outside air.

Bioaerosols, airborne particles that are living or originate from living organisms, are ubiquitous in nature and may be modified by human activities. (*I*) They become an occupational hygiene concern when, as a result of indoor sources, the kinds and levels of microorganisms inside a building or facility are different than those in the surrounding outdoor environment. Microbiological growth inside building is normally the result of water intrusion (e.g. from roof leaks), standing water, or high humidity and dew point. Bioaerosols of concern include fungi, bacteria, viruses, allergens, and other metabolic by-products. Locating sources of bioaerosols inside buildings is heavily dependent upon good investigative techniques. Such techniques include, but are not wholly dependent upon, sampling. Sampling for bioaerosols

Includes air sampling and source (e.g. bulk, swab, tape-lift) sampling.

Comments & Recommendations

On October 3, 2018 the Facilities Department for the Poughkeepsie City School District requested that our office perform an indoor air quality (IAQ) investigation in the Warring (Rooms 22 , Library, and OT-PT room) Elementary School. On October 4, 2018 we performed a visual inspection of the areas in question as well as Room 24 (the teacher of Room 24 requested an inspection while we were there). Air samples were taken in Room 22, the Library and an outdoor comparison sample for airborne fungal spores. Results of the visual inspections in the OT-PT room showed fungal growth in an unplugged refrigerator growing on food stuffs left in the refrigerator. There has been a leak(s) in the OT-PT room which has resulted in the removal of multiple ceiling tiles. Results of the visual inspections and air sampling for fungal spores (see **Results Summary**) in Rooms 22, 24, and the Library showed nothing of concern. Recommendations are as follows:

- Clean and/or remove refrigerator in OT-PT room
- Repair leak(s) in OT-PT room

References

1. **University of Minnesota:** *Fungal Glossary*. Minneapolis, MN: University of Minnesota, Department of Environmental health & Safety, 2004

Appendix'C

"Laboratory Results

Lab Use:
18037714



Aerobiology Client		Dutchess BOCES		AZ, CA, CO, FL, GA, VA, NJ		AZ, CA, CO, VA		AZ, CA, CO, FL GA, NJ, VA	
Field Contact	Brian Colandrea			Collected By/Date:	Brian Colandrea 10/4/18		Relinquished By/Date:	Brian Colandrea 10/5/18	
Reporting Address	5 BOCES Road, Poughkeepsie, NY 12601			Relinquished By/Date:			Relinquished By/Date:	ONE 10-8-18	
Billing Address	Same			Sampler Type	Andersen <input type="checkbox"/>	SampleAire <input type="checkbox"/>	Other <input checked="" type="checkbox"/>	Aero Trap <input type="checkbox"/>	BioCulture <input type="checkbox"/>
Phone/Fax	845-486-8087, fax # 845-486-4818			PO#/Job#:					
Reporting Email (s)	brian.colandrea@dcbores.org			Project Name: Poughkeepsie CSD, Warring Elementary					
Routine <input type="checkbox"/>	24 Hour <input checked="" type="checkbox"/>	Same Day <input type="checkbox"/>	4 Hour <input type="checkbox"/>	2 Hour <input type="checkbox"/>	Notes: Room 22, Library, OT-PT				
SAMPLING LOCATION ZIP CODE				12601		CC Info:			

Sample No.	Test Code	Sample Location	Total Volume/Area
1 10418-WE1	1054	Room 22	90L
2 10418-WE2	1054	Library	90L
3 10418-WE3	1054	Outside Comparison	90L
4 10418-WE4	1051	OT-PT Room, Refrigerator	N/A
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

1054	Direct, Non-viable Spore Trap	1015	Culture - WATER Legionella
1051	Direct, Qualitative- Swab/Tape	1017	Culture - SWAB Legionella
1050	Direct, Qualitative- Bulk	1010	WATER - Potable - E. coli/total coliforms
1005	AIR Culture - Bacterial Count w/ ID's	1012	SWAB - E. coli/total coliforms
1030	AIR Culture - Fungal Count w/ ID's	1028	SWAB - Sewage Screen (E. coli/Entero/fecal coliforms)
1006	SWAB Culture - Bacterial Count w/ ID's	2056	WATER - Heterotrophic Plate Count
1031	SWAB Culture - Fungal Count w/ ID's	3001	ASBESTOS - Point count
1008	BULK Culture - Bacterial Count w/ ID's	3002	ASBESTOS - PLM Analysis
1033	BULK Culture - Fungal Count w/ ID's	3003	ASBESTOS - Particle characterization
1007	WATER Culture - Bacterial Count w/ID's	3004	ASBESTOS - PCM Analysis

Dutchess BOCES
 5 Bocces Road
 Poughkeepsie, New York 12601
 Project: **POUGHKEEPSIE CSD, WARRING ELEMENTARY**
 Condition of Sample(s) Upon Receipt: Acceptable

 Date Collected: 10/04/2018
 Date Received: 10/08/2018
 Date Analyzed: 10/08/2018
 Date Reported: 10/09/2018
 Project ID: 18037714
 Page 1 of 3

1054 Spore Trap Analysis: SOP 3.8

Client Sample Number	10418-WE1				10418-WE3			
Sample Location	ROOM 22				OUTSIDE COMPARISON			
Sample Volume (L)	90				90			
Lab Sample Number	18037714-001				18037714-003			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	1	11	<1	-
ascospores	12	133	3	1/4	46	511	7	-
basidiospores	94	4178	93	1/1	131	5822	76	-
Cercospora	-	-	-	-	1	11	<1	-
Cladosporium	2	22	<1	1/41	81	900	12	-
Curvularia	1	11	<1	1/2	2	22	<1	-
Drechslera/Bipolaris group	1	11	<1	-	-	-	-	-
hyphal elements	6	67	1	3/1	2	22	<1	-
Penicillium/Aspergillus group	-	-	-	-	6	67	1	-
Pithomyces	1	11	<1	-	-	-	-	-
Pyricularia	-	-	-	-	2	22	<1	-
Rusts	5	56	1	5/1	1	11	<1	-
Smuts,Periconia,Myxomycetes	2	22	<1	1/12	23	256	3	-
	Debris Rating 4				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m³				Analytical Sensitivity: 11 spr/m³			
Comments								
Total *See Footnotes	124	4511	~100%	1/2	296	7656	~100%	-

Dutchess BOCES
 5 Boces Road
 Poughkeepsie, New York 12601
 Project: **POUGHKEEPSIE CSD, WARRING ELEMENTARY**
 Condition of Sample(s) Upon Receipt: Acceptable

 Date Collected: 10/04/2018
 Date Received: 10/08/2018
 Date Analyzed: 10/08/2018
 Date Reported: 10/09/2018
 Project ID: 18037714
 Page 2 of 3

Client Sample Number	10418-WE2				10418-WE3			
Sample Location	LIBRARY				OUTSIDE COMPARISON			
Sample Volume (L)	90				90			
Lab Sample Number	18037714-002				18037714-003			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	1	11	<1	-
ascospores	16	178	10	1/3	46	511	7	-
basidiospores	81	900	49	1/6	131	5822	76	-
Cercospora	-	-	-	-	1	11	<1	-
Cladosporium	23	256	14	1/4	81	900	12	-
Curvularia	-	-	-	-	2	22	<1	-
Drechslera/Bipolaris group	1	11	1	-	-	-	-	-
hyphal elements	3	33	2	2/1	2	22	<1	-
Penicillium/Aspergillus group	25	278	15	4/1	6	67	1	-
Pyricularia	-	-	-	-	2	22	<1	-
Rusts	5	56	3	5/1	1	11	<1	-
Scopulariopsis	4	44	2	-	-	-	-	-
Smuts,Periconia,Myxomycetes	8	89	5	1/3	23	256	3	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m³				Analytical Sensitivity: 11 spr/m³			
Comments								
Total *See Footnotes	166	1844	~100%	1/4	296	7656	~100%	-

 Client Sample #: 10418-WE4
 Sample Location: OT-PT ROOM, REFRIGERATOR
 Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7: 24hr TAT

Lab Sample #: 18037714-004

Results:	Observation
Moderate hyphae hyphae seen	1 per 5 fields
Numerous Penicillium hyphae seen	3-4 per field (minimum)
Numerous Penicillium spores seen	3-4 per field (minimum)
Numerous Penicillium conidiophores seen	3-4 per field (minimum)

Debris Rating: 2

Dutchess BOCES
5 Boces Road
Poughkeepsie, New York 12601
Project: **POUGHKEEPSIE CSD, WARRING ELEMENTARY**
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 10/04/2018
Date Received: 10/08/2018
Date Analyzed: 10/08/2018
Date Reported: 10/09/2018
Project ID: 18037714
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Footnotes and Additional Report Information

Debris Rating Table

1	Minimal (<5%) particulate present	Reported values are minimally affected by particulate load.
2	5% to 25% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
3	26% to 75% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
4	75% to 90% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
5	Greater than 90% of the trace occluded with particulate	Quantification not possible due to large negative bias. A new sample should be collected at a shorter time interval or other measures taken to reduce particulate load.

1. Penicillium/Aspergillus group spores are characterized by their small size, round to ovoid shape, being unicellular, and usually colorless to lightly pigmented. There are numerous genera of fungi whose spore morphology is similar to that of the Penicillium/Aspergillus type. Two common examples would be Paecilomyces and Acremonium. Although the majority of spores placed in this group are Penicillium, Aspergillus, or a combination of both. Keep in mind that these are not the only two possibilities.

2. Ascospores are sexually produced fungal spores formed within an ascus. An ascus is a sac-like structure designed to discharge the ascospores into the environment, e.g. Ascobolus.

3. Basidiospores are typically blown indoors from outdoors and rarely have an indoor source. However, in certain situations a high basidiospore count indoors may be indicative of a wood decay problem or wet soil.

4. The colorless group contains colorless spores which were unidentifiable to a specific genus. Examples of this group include Acremonium, Aphanocladium, Beauveria, Chrysosporium, Engyodontium microconidia, yeast, some arthrospores, as well as many others.

5. Hyphae are the vegetative mode of fungi. Hyphal elements are fragments of individual Hyphae. They can break apart and become airborne much like spores and are potentially allergenic. A mass of hyphal elements is termed the mycelium. Hyphae in high concentration may be indicative of colonization.

6. Dash (-) in this report, under raw count column means 'not detected (ND)'; otherwise 'not applicable' (NA).

7. The positive-hole correction factor is a statistical tool which calculates a probable count from the raw count, taking into consideration that multiple particles can impact on the same hole; for this reason the sum of the calculated counts may be less than the positive hole corrected total.

8. Due to rounding totals may not equal 100%.

9. Analytical Sensitivity for each spores is different for Non-viable sample when the spores are read at different percentage. Analytical Sensitivity is calculated as spr/m^3 divided by raw count. $\text{spr}/\text{m}^3 = \text{raw counts} \times (100/\% \text{ read}) \times (1000/\text{Sample volume})$. If Analytical Sensitivity is 13 spr/m^3 at 100% read, Analytical Sensitivity at 50% read would be 27 spr/m^3 , which is 2 times higher. Analytical Sensitivity provided on the report is based on an assumed 100% of the trace being analyzed.

10. Minimum Reporting Limits (MRL) for BULKS, DUSTS, SWABS, and WATER samples are a calculation based on the sample size and the dilution plate on which the organism was counted. Results are a compilation of counts taken from multiple dilutions and multiple medias. This means that every genus of fungi or bacteria recovered can be counted on the plate on which it is best represented.

11. If the final quantitative result is corrected for contamination based on the blank, the blank correction is stated in the sample comments section of the report.

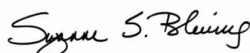
12. The results in this report are related to this project and these samples only.

13. For samples with an air volume of < 100L, the number of significant figures in the result should be considered (2) two. For samples with air volumes between 100-999L, the number of significant figures in the result should be considered (3) three. For example, a sample with a result of 55,443 spr/m^3 from a 75L sample using significant figures should be considered 55,000. The same result of 55,443 from a 150L sample using significant figures should be considered 55,400 spr/m^3 .

14. If the In/Out ratio is greater than 100 times it is indicated >100/1, rather than showing the real value.

Terminology Used in Direct Exam Reporting

Conidiophores are a type of modified hyphae from which spores are born. When seen on a surface sample in moderate to numerous concentrations they may be indicative of fungal growth.



Suzanne S. Blevins, B.S., SM (ASCP)
Laboratory Director

Appendix 'D

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STATE OF NEW YORK DEPARTMENT OF LABOR
MOLD ASSESSOR



BRIAN COLANDREA

EXPIRES: 03-20

CERT# MA01300

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