



Environmental Hygiene Report

Submitted to: Mr. John Willabay
Director of Facilities

Poughkeepsie City School District

Prepared by: Brian Colandrea, Safety and Risk Coordinator

Location	Erkvpq Elementary
Project No.	034-1819
Site Visits	October 32, 2018
Report Date	October 23, 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 8, 2018 the Facilities Department for the Poughkeepsie City School District (PCSD) requested that our office perform air sampling for airborne fungal spores in Clinton Elementary. On October 10 we performed the requested sampling. The results of the sampling revealed nothing of concern. A visual inspection revealed mold growth in a basement stairwell near a water damaged wall. Recommendations concerning this were made (see **Comments & Recommendations**).

Project Scope

Take air samples for fungal spores in corridors of Clinton Elementary School. Review the data and prepare a written report for the PCSD.

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 air 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. Each sample was taken 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.

***For Full Sampling Results See Appendix**

Air Samples

Sample ID	Sample Location	Spore Identification in spr/m ³ *
1018-KE1	Basement Stairwell	ascospores- 5556 basidiospores- 2444 Cladosporium- 1911 Penicillium/Aspergillus- 411 Smuts, Periconia, Myxomycetes- 11
1018-KE2	Corridor by Room 3	ascospores- 2844 basidiospores- 444 Cladosporium- 533 hyphal elements- 89 Penicillium/Aspergillus- 222
1018-KE3	Corridor by Room 7	ascospores- 2044 basidiospores- 2133 Cladosporium- 978 hyphal elements- 89 Smuts, Periconia, Myxomycetes- 178
1018-KE4	Corridor by Room 17	ascospores- 3200 basidiospores- 1333 Cladosporium- 667 Penicillium/Aspergillus- 178 Smuts, Periconia, Myxomycetes- 133
1018-KE5	Corridor by Room 10	ascospores- 2444 basidiospores- 1556 Cladosporium- 267 Smuts, Periconia, Myxomycetes- 89
1018-KE6	Corridor by Gym	ascospores- 5867 basidiospores- 4667 Cladosporium- 311 Penicillium/Aspergillus- 1111 Smuts, Periconia, Myxomycetes- 444
1018-KE7	Outdoor Comparison Sample	ascospores- 9333 basidiospores- 28444 Cercospora- 133 Cladosporium- 1333

		Penicillium/Aspergillus- 444 Smuts, Periconia, Myxomycetes- 178
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*spores per meter cubed

Surface Sample

Sample ID	Sample Location	Spore Identification
1018-KE8	Basement stairwell wall	Numerous Penicillium/Aspergillus group conidiophores seen Numerous Penicillium/Aspergillus group hyphae seen Numerous Penicillium/Aspergillus group spores 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. (1) 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 8, 2018 the Facilities Department for the Poughkeepsie City School District (PCSD) requested that our office perform air sampling for airborne fungal spores in Clinton Elementary. On October 10 we performed the requested sampling. The results of the sampling revealed nothing of concern. A visual inspection revealed mold growth in a basement stairwell near a water damaged wall. The following recommendations are made:

- Basement Stairwell, clean/discard wood where mold is growing
- Basement Stairwell, repair wall
- Basement Stairwell, repair leak causing damage to the wall

References

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

Appendix'C

"Laboratory Results

Lab Use:
18038684



AZ, CA, CO, FL, GA, NJ, VA

Aerobiology Client		Dutchess BOCES		AZ, CA, CO, FL, GA, VA, NJ	AZ, CA, CO, VA
Field Contact	Brian Colandrea			Collected By/Date:	Brian Colandrea 10/10/18
Reporting Address	5 BOCES Road, Poughkeepsie, NY 12601			Relinquished By/Date:	Brian Colandrea 10/11/18
Billing Address	Same			Received By/Date:	[Signature] 10/12/18
Phone/Fax	845-486-8087, fax # 845-486-4818			Sampler Type	Andersen <input type="checkbox"/> SAS <input type="checkbox"/> SampleAire <input type="checkbox"/> Aero Trap <input type="checkbox"/> BioCulture <input type="checkbox"/>
Reporting Email (s)	brian.colandrea@dcboces.org			PO#/Job#:	
Routine	24 Hour	Same Day	4 Hour	2 Hour	Project Name:
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Poughkeepsie CSD, Clinton Elementary
SAMPLING LOCATION ZIP CODE				12603	Notes:
					CC Info:

Sample No.	Test Code	Sample Location	Total Volume/Area
1018-KE1	1054	basement stairwell	90L
1018-KE2	1054	corridor by Room 3	90L
1018-KE3	1054	corridor by Room 7	90L
1018-KE4	1054	corridor by Room 17	90L
1018-KE5	1054	corridor by Room 10	90L
1018-KE6	1054	corridor by Gym	90L
1018-KE7	1054	outdoor comparison sample	90L
1018-KE8	1051	basement stairwell wall	N/A

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/Enterococcus/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 Boces Road
Poughkeepsie, New York 12601
Attn: Brian Colandrea
Project: **POUGHKEEPSIE CSD, CLINTON ELEMENTARY**
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 10/10/2018
Date Received: 10/12/2018
Date Analyzed: 10/17/2018
Date Reported: 10/17/2018
Project ID: 18038684
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1054 Spore Trap Analysis: SOP 3.8

Client Sample Number	1018-KE1				1018-KE2			
Sample Location	BASEMENT STAIRWELL				CORRIDOR BY ROOM 3			
Sample Volume (L)	90				90			
Lab Sample Number	18038684-001				18038684-002			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
ascospores	125	5556	54	-	64	2844	69	-
basidiospores	55	2444	24	-	10	444	11	-
Cladosporium	43	1911	18	-	12	533	13	-
hyphal elements	-	-	-	-	2	89	2	-
Penicillium/Aspergillus group	37	411	4	-	5	222	5	-
Smuts,Periconia,Myxomycetes	1	11	<1	-	-	-	-	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m ³				Analytical Sensitivity: 11 spr/m ³			
Comments								
Total *See Footnotes	261	10333	~100%	-	93	4133	~100%	-

Client Sample Number	1018-KE3				1018-KE4			
Sample Location	CORRIDOR BY ROOM 7				CORRIDOR BY ROOM 17			
Sample Volume (L)	90				90			
Lab Sample Number	18038684-003				18038684-004			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
ascospores	46	2044	38	-	72	3200	58	-
basidiospores	48	2133	39	-	30	1333	24	-
Cladosporium	22	978	18	-	15	667	12	-
hyphal elements	2	89	2	-	-	-	-	-
Penicillium/Aspergillus group	-	-	-	-	4	178	3	-
Smuts,Periconia,Myxomycetes	4	178	3	-	3	133	2	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m ³				Analytical Sensitivity: 11 spr/m ³			
Comments								
Total *See Footnotes	122	5422	~100%	-	124	5511	~100%	-

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Client Sample Number	1018-KE5				1018-KE6			
Sample Location	CORRIDOR BY ROOM 10				CORRIDOR BY GYM			
Sample Volume (L)	90				90			
Lab Sample Number	18038684-005				18038684-006			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
ascospores	55	2444	56	-	132	5867	47	-
basidiospores	35	1556	36	-	105	4667	38	-
Cladosporium	6	267	6	-	7	311	3	-
Penicillium/Aspergillus group	-	-	-	-	25	1111	9	-
Smuts,Periconia,Myxomycetes	2	89	2	-	10	444	4	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m ³				Analytical Sensitivity: 11 spr/m ³			
Comments								
Total *See Footnotes	98	4356	~100%	-	279	12400	~100%	-

Client Sample Number	1018-KE7			
Sample Location	OUTDOOR COMPARISON SAMPLE			
Sample Volume (L)	90			
Lab Sample Number	18038684-007			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out
ascospores	210	9333	23	-
basidiospores	640	28444	71	-
Cercospora	3	133	<1	-
Cladosporium	30	1333	3	-
Penicillium/Aspergillus group	10	444	1	-
Smuts,Periconia,Myxomycetes	4	178	<1	-
	Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m ³			
Comments				
Total *See Footnotes	897	39867	~100%	-

Dutchess BOCES
5 Boces Road
Poughkeepsie, New York 12601
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Condition of Sample(s) Upon Receipt: Acceptable

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Project ID: 18038684
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Client Sample #: 1018-KE8
Sample Location: BASEMENT STAIRWELL WALL
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7

Lab Sample #: 18038684-008

Results:	Observation
Numerous Penicillium/Aspergillus group conidiophores seen	3-4 per field (minimum)
Numerous Penicillium/Aspergillus group hyphae seen	3-4 per field (minimum)
Numerous Penicillium/Aspergillus group spores seen	3-4 per field (minimum)

Debris Rating: 3

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Project ID: 18038684
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Footnotes and Additional Report Information

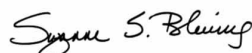
Debris Rating Table

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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