ESI Environmental Solutions, Inc.

www.esi4u.com (410)-867-6262

Discovery Environmental Inspection Report

Project Contact Information

Alex Baylor Environmental Specialists Environmental Safety Office 13306 Old Marlboro Pike Upper Marlboro, MD 20772 301-952-6760 alex.baylor@pgcps.org	Magnolia Elementary School 8400 Nightingale Drive Lanham, MD 20706 54,506Ft^2	Zack Butcher Certified Indoor Environmentalist Environmental Solutions, Inc. 6114 Drum Point Rd Deale, MD 20751 410-867-6262 zack@esi4u.com

Property Location

8400 Nightingale Drive Lanham, MD 20706

Date of Inspection: 2/27/2019

Prepared By: Zack Butcher

Certified Indoor Environmentalist (CIE)

Dear Mr. Baylor,

The results of the inspection and testing performed at Magnolia Elementary School are concluded, and the findings are enclosed. I want to thank you for allowing ESI the opportunity to service your indoor environmental needs. Included in this report are the observations, lab results, and recommendations from ESI's 02/27/2019 inspection and testing.

Background Information

The Prince Georges County Public School Environmental Team has taken a proactive approach in cleaning the above-mentioned school to ensure there are no health or environmental risks related to microbial and biological hazards. Historically elevated levels of humidity, condensation from pipes, periodic steam leaks and outdated HVAC systems, may have contributed to water damage ceiling tiles and colonization of mold spores in various area of the school.

Purpose

ESI was engaged to inspect the school in a random sufficient manner. Classrooms, administration offices, and common area building materials and contents, will be visually inspected for evidence of water damage and microbial growth.

In each location inspected, the indoor air quality will be tested for elevated levels of carbon dioxide and carbon monoxide, in addition to measuring the relative humidity and temperature. Microbial/biological hazards within the breathable air space will also be tested.

Based upon the visual assessment, instrument readings, and lab results, ESI will determine if additional remediation in required.

Observations and instrument readings

The following table is designed for this project. Some of the fields may not be filled in due to not being applicable during the time of the inspection. You will notice either a 'YES' or 'NO' in the table. 'YES' indicates that mold and/or water damage was detected and 'NO' indicates it was not. If 'YES' is noted, remediation recommendation will be included for the area inspected.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
F2	2367405	N/A	27%	63.1°	620	0.00	8,600	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU +Wall Panel	1	0	5	10	1	0	2
YES	NO	NO	NO	NO	NO	NO	N/A	NO

Observation Notes

- There was one water stained ceiling tile.
- Most of the ceiling tiles were severely cupped. This is most likely due to elevated relative humidity during the warmer months of the year.
- There was some dust and debris on the bottom of some of the tables and on horizontal surfaces.
- The indoor air quality should not pose health or environmental risks, as the total spore count was 160 spores/M³ of breathable air space.

Recommendations

- Remove, discard, and replace the water stained ceiling tile and the severely cupped ceiling tiles.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
A4	2367406	N/A	19.1%	66.5°	580	0.00	11,500	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU + Chalk-board	1	24	10	10	1	NO	2 + 1 Door
YES	NO	NO	NO	NO	NO	NO	N/A	NO

Inspected

- There were two water stained ceiling tiles.
- Many of the ceiling tiles were cupped. This is also most likely due to elevated relative humidity during the warmer months of the year.
- There was some dust and debris on the convector unit fins and on horizontal surfaces in the class room.
- There was a water stain on the CMU wall behind and under the sink cabinet.
- The indoor air quality should not pose health or environmental risks, as the total spore count was 40 spores/M³ of breathable air space.
- ***Please note***: One of the windows was open during the inspection and testing.

Recommendations

- Remove, discard, and replace the water stained ceiling tiles and the severely cupped ceiling tiles.
- Ensure there are no active plumbing links from the sink.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
B4	2367407	N/A	29.1%	66.9°	1077	0.00	11,500	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU + Wall Panel	1	23	6	7	1	NO	2
YES	NO	NO	NO	NO	NO	NO	N/A	NO

Observation Notes

- Several ceiling tiles were cupped, most likely due to elevated relative humidity during the warmer months of the year.
- There were water stains in the sink cabinet.
- There was some dust and debris on horizontal surfaces and other contents.
- The Carbon Dioxide (CO2) level in this room was slightly elevated at 1,077 ppm (parts per million).
- The indoor air quality should not pose health or environmental risks, as the total spore count was 40 spores/M^3 of breathable air space.

Recommendations

- Remove, discard, and replace the severely cupped ceiling tiles.
- Ensure there are no active plumbing links from the sink.
- To reduce Carbon Dioxide (CO2) levels, increase air exchange within this classroom. Ventilating, or circulating the air with a fan will also reduce Carbon Dioxide (CO2) levels.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
K1	2367408	N/A	20.1%	70.8°	890	0.00	11,500	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU + Chalk-board	1	0	10	8	1	NO	1 + 1 Door
YES	NO	NO	N/A	NO	NO	NO	N/A	NO

Observation Notes

- There was one water stained ceiling tile.
- There were several cupped ceiling tiles. This is most likely due to elevated relative humidity during the warmer months of the year.
- There were water stains in the sink cabinet.
- The indoor air quality should not pose health or environmental concerns, as there were no spores identified in the breathable air space.

Recommendations

- Remove, discard, and replace the water stained ceiling tile, and the cupped ceiling tiles.
- Ensure there are no active plumbing leaks from the sink.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
D3	2367409	N/A	22.4%	70.3°	913	0.00	8,900	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU + Wall Panel	1	22	4	5	1	NO	2
YES	NO	NO	NO	NO	NO	NO	N/A	NO

Observation Notes

- The cupping of the ceiling tiles was minimal in this classroom compared to some of the ceiling tiles in other classrooms and hallways; however, several ceiling tiles were cupped.
- There were cracks at the bottom of the CMU wall that adjoins the courtyard. These may be potential exterior water infiltration sources and should be inspected by a waterproofing/foundation contractor.
- The indoor air quality should not pose health or environmental concerns, as the total spore count was 280 spores/M^3 of breathable air space.

Recommendations

- Remove, discard, and replace the cupped ceiling tiles.
- Have the Concrete Masonry Unit (CMU) wall that adjoins the courtyard inspected by a waterproofing/foundation contractor.

Please note: There were cupped ceiling tiles in many of the hallways. This is most likely due to elevated relative humidity during the warmer months of the year. These ceiling tiles should also be removed, discarded, and replaced.

Interpretation of Lab Results

In the enclosed Air Cassette Analysis report, you will notice Fungal Identification, which is the genera detected in the breathable airspace inside, and outside. The Raw count is the actual number of spores counted on the slide, and the Count/m3 are the spores per cubic meter of air. The other particles are non-living particles such as dander, mycelial fragments, pollens, etc.

For humans to be exposed indoors, fungal spores, fragments, or metabolites must be released into the air and inhaled, physically contacted (dermal exposure), or ingested. Whether symptoms develop in people exposed to fungi depends on the nature of the fungal material (e.g., allergenic, toxic, or infectious), the amount of exposure, and the susceptibility of exposed persons.
Susceptibility varies with genetic predisposition (e.g., allergic reactions do not always occur in all individuals), age, state of health, and concurrent exposures.

Air Sampling Lab Results

SanAir Technologies Laboratory

Name: Environmental Solutions, Inc
Address: 534-A Deale Road
Deale, MD 20751
Phone: 410-867-6262

Project Number: 8400
P.O. Number: JZB
Project Name: Magnolia Elementary School
Collected Date: 2/27/2019
Received Date: 2/28/2019 9:30:00 AM

SanAir ID Number
19009210
FINAL REPORT
3/1/2019 4:02:04 PM

Analyst: Goodwin, Aaron

Air Cassette Analysis

ND = None Detected. Blank spaces indicate no spores detected.

SanAir ID Number	19009210-001			19009210-002			19009210-003			19009210-004		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2367405			2367406			2367407			2367408		
Sample Identification	Room F-2			Room A-4			Room B-4			Room K-1		
Sample Type	Air Cassette - Micro-5			Air Cassette - Micro-5			Air Cassette - Micro-5			Air Cassette - Micro-5		
Volume	25 Liters			25 Liters			25 Liters			25 Liters		
Analytical Sensitivity	40 Count/M³			40 Count/M³			40 Count/M³			40 Count/M³		
Background Density	2			2			2			1+		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Mycelial Fragments	1	40	n/a	ND			2	80	n/a	1	40	n/a
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Aspergillus/Penicillium	2	80	50	ND			ND			ND		
Bispora like	ND			1	40	>99	ND			ND		
Cladosporium species	2	80	50	ND			ND			ND		
Smuts/Myxomycetes	ND			ND			1	40	>99	ND		
TOTAL	**4**	**160**		**1**	**40**		**1**	**40**		**ND**	**ND**	

Signature: Date: 3/1/2019 Reviewed: Date: 3/1/2019

SanAir Technologies Laboratory

Name: Environmental Solutions, Inc
Address: 534-A Deale Road
Deale, MD 20751
Phone: 410-867-6262

Project Number: 8400
P.O. Number: JZB
Project Name: Magnolia Elementary School
Collected Date: 2/27/2019
Received Date: 2/28/2019 9:30:00 AM

SanAir ID Number
19009210
FINAL REPORT
3/1/2019 4:02:04 PM

Analyst: Goodwin, Aaron

Air Cassette Analysis

ND = None Detected. Blank spaces indicate no spores detected.

SanAir ID Number	19009210-005			19009210-006				
Analysis Using STL	107C			107C				
Sample Number	2367409			2367410				
Sample Identification	Room D-3			Control-Outside				
Sample Type	Air Cassette - Micro-5			Air Cassette - Micro-5				
Volume	25 Liters			25 Liters				
Analytical Sensitivity	40 Count/M³			40 Count/M³				
Background Density	1+			1+				
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**		
Mycelial Fragments	1	40	n/a	1	40	n/a		
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**		
Aspergillus/Penicillium	5	200	71	2	80	>99		
Bispora like	ND			ND				
Cladosporium species	2	80	29	ND				
Smuts/Myxomycetes	ND			ND				
TOTAL	**7**	**280**		**2**	**80**			

Signature: Date: 3/1/2019 Reviewed: Date: 3/1/2019

Property Location: 8400 Nightingale Drive
Lanham, MD 20706

Date of Inspection: 2/27/2019

SanAir Technologies Laboratory

SanAir ID Number
19009210
FINAL REPORT
3/1/2019 4:02:04 PM

Name: Environmental Solutions, Inc
Address: 534-A Deale Road
Deale, MD 20751
Phone: 410-867-6262

Project Number: 8400
P.O. Number: JZB
Project Name: Magnolia Elementary School
Collected Date: 2/27/2019
Received Date: 2/28/2019 9:30:00 AM

Organism Descriptions

The descriptions of the organisms presented are derived from various reference materials. The laboratory report is based on the data derived from the samples submitted and no interpretation of the data, as to potential, or actual, health effects resulting from exposure to the numbers of organisms found, can be made by laboratory personnel. Any interpretation of the potential health effects of the presence of this organism must be made by qualified professional personnel with first hand knowledge of the sample site, and the problems associated with that site.

Mycelial Fragments - A mycelium (plural = mycelia) is the "body" of a fungus. It is a collective term for hyphae (singular = hypha), which are the tubular units of the mycelium usually composed of chitin. The terms hyphae and mycelial fragments are used interchangeably. [This information was referenced from the mycology text "The Fifth Kingdom"]In some cases a fungal identification cannot be obtained due to lack of sporulation. Only the mycelial fragments are present, and cannot be identified without the distinguishing characteristics of the spores or the structures they grow from.
Health Effects: Allergic reactions may occur in the presence of spores (conidia) or mycelial/hyphal fragments.

Aspergillus/Penicillium - These spores are easily aerosolized. Only through the visualization of reproductive structures can the genera be distinguished. Also included in this group are the spores of the genera Acremonium, Phialophora, Verticillium, Paecilomyces, etc. Small, round spores of this group lack the necessary distinguishing characteristics when seen on non-viable examination.
Health Effects: Can cause a variety of symptoms including allergic reactions. Most symptoms occur if the individual is immunocompromised in some way (HIV, cancer, etc). Both Penicillium and Aspergillus spores share similar morphology on non-viable analysis and therefore are lumped together into the same group.

Bispora like - Bispora is a ubiquitous anamorphic fungus and may be isolated from decaying wood.
Health Effects: There has been no known research on the health effects, toxicity, or allergens to this fungi.
References: C.J. K. Wang, R.A. Zabel, Identification Manual for Fungi from Utility Poles in the Eastern United States, American Type Culture Collection 1990

Cladosporium species - The most commonly identified outdoor fungus. The outdoor numbers are reduced in the winter and are often high in the summer. Often found indoors in numbers less than outdoor numbers. It is commonly found on the surface of fiberglass duct liner in the interior of supply ducts. A wide variety of plants are food sources for this fungus. It is found on dead plants, woody plants, food, straw, soil, paint and textiles. Often found in dirty refrigerators and especially in reservoirs where condensation is collected, on moist window frames it can easily be seen covering the whole painted area with a velvety olive green layer.
Health Effects: It is a common allergen. It can cause mycosis. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchiospasms, chronic cases may develop pulmonary emphysema. Illnesses caused by this genus can include phaeohyphomycosis, chromoblastomycosis, hay fever and common allergies.
References: Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control. London and New York: Taylor & Francis, 2001.

Smuts/Myxomycetes - Smuts and Myxomycetes are parasitic plant pathogens. They are typically grouped together due to their association with plants, the outdoors and because they share similar microscopic morphology.
Health Effects: Can produce type I fungal hypersensitivity reactions.
References: Martin, G.W., C.J. Alexopoulos, and M.L. Farr. The Genera of Myxomycetes. Iowa City, Iowa: University of Iowa Press, 1983.

Conclusions

The samples in this report indicate a normal fungal ecology for the specific locations tested. Based on the visual inspection and lab results, there are no health or environmental risks related to the remediated areas of the school. Please refer to the attached lab results for identification and spore count per location.

I hope you found our service beneficial. If you have any questions or concerns, please feel free to contact me at 410-867-6262.

Respectfully,

Zack Butcher (CIE)
Environmental Solutions, Inc.

Industry References

Since the 1993 New York City Department of Health (NYCDOH) document (Assessment and remediation of *Stachybotrys Atra* in Indoor Environments) was produced, several other guidance documents have been written. This report was developed in accordance with and including:

- *Fungal Contamination in Buildings: A Guide to Recognition and Management* (Health Canada, 1995).
- *Control of Moisture Problems Affecting Biological Indoor Air Quality* (Flannigan and Morey, 1996).
- *Bioaerosols: Assessment and Control* (American Conference of Government Industrial Hygienists [ACGIH], 1999).
- *Guidelines on Assessment and Remediation of Fungi in Indoor Environments* (NYCDOH, 2000). [external link]
- *Mold Remediation in Schools and Commercial Buildings* (U.S. EPA, 2001).
- *Report of the Microbial Growth Task Force* (The American Industrial Hygiene Association, 2001).
- *Fungal Contamination: A manual for investigation, remediation and control (BECi) 2005*.
- *29 CFR 1910, Occupational Safety and Health Standards for General Industry, U.S. Department of Labor*
- Institute of Inspection, Cleaning and Restoration Certification Standard IICRC S520 *29 CFR 1926, Occupational Safety and Health Standards for the Construction Industry*, U.S. Department of Labor
- *40 CFR 61, National Emission Standards for Hazardous Air Pollutants (NESHAP), U.S. Environmental Protection Agency*
- *ACR 2006, Assessment, Cleaning and Restoration of HVAC Systems, National Air Duct Cleaners Association, 2006**
- *ASHRAE Standards 62.1 or 62.2*
- *ASTM D-1653, Standard Test Methods for Water Vapor Transmission of Organic Coating Films*
- *Bioaerosols: Assessment and Control,* American Conference of Governmental Industrial Hygienists, 1999
- *Field Guide for Determination of Biological Contaminants in Environmental Samples, American Industrial Hygiene Association, 2005*
- *A Guide for Mold Remediation in Schools and Commercial Buildings, US Environmental Protection Agency, 2001 Protecting the Built Environment: Cleaning for Health, Michael A. Berry Ph.D., 1993*
- *IICRC S100 Standard and Reference Guide for Professional Carpet Cleaning, Fourth Edition, Institute of Inspection, Cleaning and Restoration Certification, (S100)**
- *IICRC S300 Standard and Reference Guide for Professional Upholstery Cleaning, First Edition, Institute of Inspection, Cleaning and Restoration Certification, (S300)**
- *ANSI/IICRC S500 Standard and Reference Guide for Professional Water Damage Restoration, Third Edition, Institute of Inspection, Cleaning and Restoration Certification, (S500)**