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	Lewisdale Elementary School 54,103 square feet	Bryan Harrington Certified Indoor Environmentalist Environmental Solutions, Inc. 6114 Drum Point Rd Deale, MD 20751 410-867-6262 Bryan@esi4u.com

Property Location

2400 Banning Place, Hyattsville, MD 20783

Date of Inspection 3/27/2019

Prepared By: Bryan Harrington

Certified Indoor Environmentalist (CIE)

Dear Mr. Baylor,

The results of the inspection and testing performed at Lewisdale Elementary School, located at 2400 Banning Place, Hyattsville, MD 20783, 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 3/27/2019 inspection and testing.

Background Information

The Prince George's 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 hazards. Historically elevated levels of humidity, condensation from pipes, periodic steam leaks, and outdated HVAC systems may have contributed to water damaged ceiling tiles and colonization of mold spores in various areas of the school.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 water damage and microbial growth.

In each location inspected, the indoor air quality will be tested for elevated levels of carbon monoxide and carbon dioxide, in addition to measuring the relative humidity and temperature. Microbial hazards within the breathable airspace 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.	
Room G	2378120	**YES**	22.2%	73.7	**2210**	002	8,242	
Inspected								
Ceiling Tiles	Walls	Teachers Desks	Student Desks	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	Plaster	0	26	5	7	1	0	1
YES	NO	NO	NO	**YES**	NO	NO	NO	NO

Observation Notes

- There was suspected microbial growth on the underside of the table in front of the convector. A surface swab was collected, and "Light" Aspergillus species was identified on the underside of the table.
- There were 7 water damaged ceiling tiles throughout the room.
- There were amplified levels of Carbon dioxide (2210 ppm) in this location.
- The airborne fungal spores (560 Count/M^3) and Carbon monoxide (002 ppm) should not pose environmental or exposure risks at these levels.

Recommendations

- HEPA vacuum the underside of the table in front of the convector. Then damp-wipe with ShockWave or equivalent.
- Remove water damaged ceiling tiles and place in contractor's bag for disposal. Replace ceiling tiles as needed.
- Increase air exchanges to reduce Carbon dioxide (CO2) levels within this location.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Testing Office	2378121	NO	24.2%	71.2	**1393**	001	2,871	
Inspected								
Ceiling Tiles	Walls	Teachers Desks	Student Desks	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Sinks
2x4	CMU	1	0	3	10	0	1	1
YES	NO	NO	NO	NO	NO	NO	NO	NO

Observation Notes

- Discolorations on underside of tables were found to be cosmetic.
- There were 3 water damaged ceiling tiles in the middle of the room.
- There were amplified levels of Carbon dioxide (1393 ppm) in this location.
- The airborne fungal spores (160 Count/M^3) and Carbon monoxide (001 ppm) should not pose environmental or exposure risks at these levels.

Recommendations

- Remove water damaged ceiling tiles and place in contractor's bag for disposal. Replace ceiling tiles as needed.
- Increase air exchanges to reduce Carbon dioxide (CO2) levels within this location.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Room 2	2378122	**YES**	17.8%	78.4	**1284**	001	9,539	
Inspected								
Ceiling Tiles	Walls	Teachers Desks	Student Desks	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Sinks
3x8	CMU	2	25	5	10	1	0	1
NO	NO	NO	NO	**YES**	**YES**	NO	NO	NO
Observation Notes								

- There was suspected microbial growth on the underside of the rectangular tables, particularly the two computer tables. A surface swab was collected, and "Light" Aspergillus/Penicillium was identified on the underside of the tables.
- There was suspected microbial growth on the backside of the wood bookshelf in front of the teacher's desk.
- There were amplified levels of Carbon dioxide (1284 ppm) in this location.
- The level of airborne fungal spores (2880 Count/M^3) was elevated. The prominent genus detected was Aspergillus/Penicillium at 2720 Count/M^3).
- The Carbon monoxide (001 ppm) should not pose environmental or exposure risks at these levels.

Recommendations

- Engage a HEPA filtered negative air machine in this location.
- HEPA vacuum the underside of the rectangular computer tables. Then damp-wipe with ShockWave or equivalent.
- HEPA vacuum the wood bookshelf in front of the teacher's desk. Then damp-wipe with ShockWave or equivalent.
- Disengage negative air ducting and allow HEPA filtered air filtration device to run in circulation mode for 8-12 hours following the microbial cleaning.
- Increase air exchanges to reduce Carbon dioxide (CO2) levels within this location.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Room 21	2378128	NO	21.5%	73.9	**1502**	001	6,791	
Inspected								
Ceiling Tiles	Walls	Teachers Desks	Student Desks	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	26	2	7	0	4	4
NO	NO	NO	**YES**	NO	NO	NO	NO	NO
Observation Notes								

- There was suspected microbial growth on the underside of the student desks, particularly the underside of the wood desktops.
- There were amplified levels of Carbon dioxide (1502 ppm) in this location.
- The airborne fungal spores (560 Count/M^3) and Carbon monoxide (001 ppm) should not pose environmental or exposure risks at these levels.

Recommendations

- HEPA vacuum the underside of the student desks, particularly the wood desktop. Then damp-wipe with ShockWave or equivalent.
- Increase air exchanges to reduce Carbon dioxide (CO2) levels within this location.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Room 14	2378123	NO	26.6%	71.2	**1428**	001	10,505	
Inspected								
Ceiling Tiles	Walls	Teachers Desks	Student Desks	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Sinks
3x8	CMU	1	32	3	10	1	0	1
YES	NO	NO	NO	**YES**	NO	NO	NO	NO
Observation Notes								
• There was suspected microbial growth on the underside of the tables located in the teacher's office. • There were 3 water damaged ceiling tiles throughout the room, one along the exterior wall and two in the corner above the fish tank. • There were amplified levels of Carbon dioxide (1428 ppm) in this location. • The airborne fungal spores (240 Count/M^3) and Carbon monoxide (001 ppm) should not pose environmental or exposure risks at these levels.								
Recommendations								
• HEPA vacuum the underside of the tables in the teacher's office. Then damp-wipe with ShockWave or equivalent. • Remove water damaged ceiling tiles and place in contractor's bag for disposal. Replace ceiling tiles as needed. • Increase air exchanges to reduce Carbon dioxide (CO2) levels within this location.								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.
Outdoors	2378140	N/A	14.0%	50.9	498	001	N/A
Observation Notes							
• The total spore count was 240 Count/M^3 with the prominent genera being Aspergillus/Penicillium, Basidiospores, and Cladosporium species.							

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, both indoors and/or outdoors (control sample). The Raw Count is the actual number of spores counted on the slide, and the Count/M^3 are the spores per cubic meter of air. The Other particles are non-living particles such as dander, mycelial fragments, pollens, etc…

In order 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: 2400 Banning Place
P.O. Number:
Project Name: Lewisdale Elementary School
Collected Date: 3/27/2019
Received Date: 3/28/2019 9:30:00 AM

SanAir ID Number
19014542
FINAL REPORT
4/1/2019 9:03:22 AM

Analyst: Shepperson, Josh

Air Cassette Analysis

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

SanAir ID Number	19014542-001			19014542-002			19014542-003			19014542-004		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2378120			2378121			2378122			2378128		
Sample Identification	Room G			Testing Office			Room 2			Room 21		
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+			2		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Dander	153	6120	n/a	41	1640	n/a	81	3240	n/a	64	2560	n/a
Fibers	10	400	n/a	6	240	n/a	13	520	n/a	14	560	n/a
Pollen												
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Aspergillus/Penicillium	12	480	86				68	2720	94	11	440	79
Basidiospores	1	40	7	2	80	50				1	40	7
Chaetomium species										1	40	7
Cladosporium species				1	40	25	4	160	6	1	40	7
Curvularia species	1	40	7									
Pestalotia- / Pestalotiopsis-like				1	40	25						
TOTAL	**14**	**560**		**4**	**160**		**72**	**2880**		**14**	**560**	

Signature: Date: 3/29/2019 Reviewed: L. Claire Macdonald Date: 3/31/2019

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4/1/2019 9:03:22 AM

Analyst: Shepperson, Josh

Air Cassette Analysis

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

SanAir ID Number	19014542-005			19014542-006				
Analysis Using STL	107C			107C				
Sample Number	2378123			2378140				
Sample Identification	Room 14			Outdoors				
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	2			2				
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**		
Dander	78	3120	n/a	1	40	n/a		
Fibers	9	360	n/a	1	40	n/a		
Pollen				1	40	n/a		
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**		
Aspergillus/Penicillium	4	160	67	6	240	>99		
Basidiospores	1	40	17					
Chaetomium species								
Cladosporium species	1	40	17					
Curvularia species								
Pestalotia- / Pestalotiopsis-like								
TOTAL	**6**	**240**		**6**	**240**			

Signature: Joshua Shepperson Date: 3/29/2019 Reviewed: L. Claire Macdonald Date: 3/31/2019

Direct Identification Lab Results

SanAir Technologies Laboratory

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4/1/2019 9:03:22 AM

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Address: 534-A Deale Road
Deale, MD 20751
Phone: 410-867-6262

Project Number: 2400 Banning Place
P.O. Number:
Project Name: Lewisdale Elementary School
Collected Date: 3/27/2019
Received Date: 3/28/2019 9:30:00 AM

Analyst: Shepperson, Josh

Direct Identification Analysis

SanAir ID: 19014542-007 Sample #:Swab Room G Table

D1 - Direct Identification Analysis on Surface Swab using STL 104

Direct ID of Mold

Fungi	Estimated Amount
Aspergillus species	Light

SanAir ID: 19014542-008 Sample #:Swab Room 2 Rectangular Tables

D1 - Direct Identification Analysis on Surface Swab using STL 104

Direct ID of Mold

Fungi	Estimated Amount
Aspergillus/Penicillium	Light

Estimated Amount	Indication of Growth	Evidence of Mycelial Fragments/Conidiophores
Rare	Not Likely	None
Light	Possible	Some, 10 to 25% of Tape Covered
Moderate	Probable	Abundant, 25 to 50% of Tape Covered
Heavy	Significant	Throughout, 50 to 100% of Tape Covered

*Refer to additional information page for further details

Signature: Joshua Shepperson
Date: 3/29/2019

Reviewed: L. Claire Macdonald
Date: 3/31/2019

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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.

Dander - Comprised of human and/or animal skin cells. Counts may be higher in carpeted rooms and in rooms with more traffic.
Health Effects: May cause allergies.

Fibers - This category can include clothing, carpet, and insulation fibers.

Pollen - Produced by trees, flowers, weeds and grasses. The level of pollen production can depend on water availability, precipitation, temperature, and light. Pollen is usually dispersed by either insects or the wind.
Health Effects: Mostly effects the respiratory tract with hay fever symptoms but has also been shown to trigger asthma in some people.

Aspergillus species - A genus of fungi containing over 180 recognized species. Members of this genus have been recovered from a variety of habitats, but are especially common as saprophytes on decaying vegetation, soils, stored food, and feed products in tropical and subtropical regions. Some species are xerophilic. Some species are parasitic on insects, plants and animals, including man. Some species are reported mycotoxin producers. Both Penicillium and Aspergillus spores share similar morphology on non-viable analysis and therefore are lumped together into the same group. Only through the visualization of reproductive structures can the genera be distinguished.
Health Effects: Can produce type I and III fungal hypersensitivities. All of the species contained in this genus should be considered allergenic. Various Aspergillus species are a common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchiospasms. Chronic cases may develop pulmonary emphysema. Members of this genus are reported to cause a variety of opportunistic infections of the ears and eyes. Severe pulmonary infections may also occur.
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.

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.

Basidiospores - From the Subphylum Basidiomycotina which contains the mushrooms, shelf fungi, and a variety of other macrofungi. They are saprophytes, ectomycorrhizal fungi or agents of wood rot, which may destroy the structure wood of buildings. It is extremely difficult to identify a specific genera of mushrooms by using standard culture plate techniques. Some basidiomycete spores can be identified by spore morphology; however, some care should be exercised with regard to specific identification. The release of basidiospores is dependant upon moisture, and they are dispersed by wind.
Health Effects: Many have the potential to produce a variety of toxins. Members of this group may trigger Type I and III fungal hypersensitivity reactions. Rarely reported as opportunistic pathogens.

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Chaetomium species - It is an ascomycete. It is found on a variety of substrates containing cellulose including paper and plant compost. It can be found on the damp or water damaged paper in sheetrock after a long term water damage. Several species have been reported to play a major role in decomposition of cellulose made materials. These fungi are able to dissolve the cellulose fibers in cotton and paper, and thus cause these materials to disintegrate. The process is especially rapid under moist conditions.
Health Effects: Chaetomium can produce type I fungal hypersensitivity and has caused onychomycosis (nail infections).
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.

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.

Curvularia species - Curvularia is found on plant material and is considered a saprobe. It has also been isolated from dust samples and from wallpaper.
Health Effects: It has been reported to cause type I hypersensitivity and to be a cause of allergic fungal sinusitis. It may cause corneal infections, mycetoma and infections in immune compromised hosts.
References: De Hoog, G.S., J. Guarro, J. Gene, and M.J. Figueras. Atlas of Clinical Fungi, 2nd Edition. The Netherlands: CBS, 2000.

Pestalotia- / Pestalotiopsis-like - This group consists of several genera. Mostly plant pathogens.

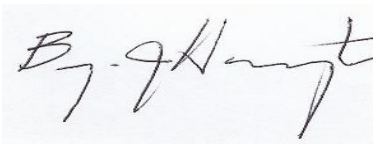
Conclusions/Recommendations

The water damaged ceiling tiles in Room G, Testing Office, and Room 14 should be removed and discarded. The wood furniture in Room G, Room 2, Room 21, and Room 14 should be HEPA vacuumed, then damp-wiped.

The airborne mold spore levels in Room 2 were elevated and require HEPA filtered air filtration to reduce the spore count. In addition, the amplifications of Carbon dioxide throughout the property should be reduced by increasing air movement and ventilation.

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,



Bryan Harrington (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)**