



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	Highland Park Elementary School 61,555 square feet	Bryan Harrington Certified Indoor Environmentalist Environmental Solutions, Inc. 6114 Drum Point Rd Deale, MD 20751 410-867-6262 Bryan@esi4u.com
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### Property Location

6501 Lowland Drive, Landover, MD 20785

**Date of Inspection:** 4/3/2019



**Prepared By: Bryan Harrington**

Certified Indoor Environmentalist (CIE)

Dear Mr. Baylor,

The results of the inspection and testing performed at Highland Park Elementary School, which is located at 6501 Lowland Drive, Landover, MD 20785, 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 4/3/2019 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 Historically elevated levels of humidity, condensation from pipes, periodic steam leaks, and outdated HVAC systems may have contributed to water damage ceiling tiles and colonization of mold spores in various areas of the school.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 is 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 B12	2434626	NO	33.8%	68.3	863	001	6,980	
Inspected								
Ceiling Tiles	Walls	Teacher's Desks	Student Desks	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Sinks
2x4'	CMU	1	8	2	7	1	1	1
NO	NO	NO	NO	NO	NO	NO	NO	NO
Observation Notes								
<ul style="list-style-type: none"> <li>There were no signs of visible mold growth in this location.</li> <li>The airborne fungal spores (120 Count/M<sup>3</sup>), Carbon monoxide (001 ppm), and Carbon dioxide (863 ppm) should not pose environmental or exposure risks at these levels.</li> </ul>								
Recommendations								
NONE								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Room B14	2434645	NO	30.9%	71.0	831	001	6,980	
Inspected								
Ceiling Tiles	Walls	Teacher's Desks	Student Desks	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Sinks
2x4	CMU	1	2	7	6	1	1	1
NO	NO	NO	NO	NO	NO	NO	NO	NO
Observation Notes								
<ul style="list-style-type: none"> <li>There were no signs of visible mold growth in this location.</li> <li>The airborne fungal spores (40 Count/M<sup>3</sup>), Carbon monoxide (001 ppm), and Carbon dioxide (831 ppm) should not pose environmental or exposure risks at these levels.</li> </ul>								
Recommendations								
NONE								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
<b>Room C10</b>	2434642	NO	34.8%	72.6	<b>1945</b>	001	7,951	
<b>Inspected</b>								
Ceiling Tiles	Walls	Teacher's Desks	Student Desks	Tables	Cabinets Shelving	Convactor	HVAC Diffusors	Sinks
2x4'	CMU	1	0	7	9	1	1	1
NO	NO	NO	NO	NO	NO	NO	NO	NO
<b>Observation Notes</b>								
<ul style="list-style-type: none"> <li>• There were no signs of visible mold growth in this location.</li> <li>• There were amplified levels of Carbon dioxide (1945 ppm) in this location.</li> <li>• The airborne fungal spores (240 Count/M<sup>3</sup>) and Carbon monoxide (001 ppm) should not pose environmental or exposure risks at these levels.</li> </ul>								
<b>Recommendations</b>								
<ul style="list-style-type: none"> <li>• Increase air movement and ventilation to reduce Carbon dioxide (CO2) levels within this location.</li> </ul>								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
<b>Room C04</b>	2434636	NO	31.9%	73.0	856	001	7,056	
<b>Inspected</b>								
Ceiling Tiles	Walls	Teacher's Desks	Student Desks	Tables	Cabinets Shelving	Convactor	HVAC Diffusors	Sinks
2x4' and 2x2'	CMU	1	2	4	7	1	1	1
<b>YES (2x2')</b>	NO	NO	NO	NO	NO	NO	NO	NO
<b>Observation Notes</b>								
<ul style="list-style-type: none"> <li>• There was 5 water damaged 2x2' ceiling tiles along the exterior wall.</li> <li>• There were no signs of visible mold growth in this location.</li> <li>• The airborne fungal spores (120 Count/M<sup>3</sup>), Carbon monoxide (001 ppm), and Carbon dioxide (856 ppm) should not pose environmental or exposure risks at these levels.</li> </ul>								
<b>Recommendations</b>								
<ul style="list-style-type: none"> <li>• Remove the water damaged ceiling tiles and place in contractor's bag for disposal. Replace ceiling tiles as needed.</li> </ul>								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Room D21	2434041	NO	26.4%	71.6	686	001	7,938	
Inspected								
Ceiling Tiles	Walls	Teacher's Desks	Student Desks	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Sinks
2x4'	CMU and drywall	0	0	14	9	1	1	4
NO	NO	NO	NO	NO	NO	NO	NO	NO
Observation Notes								
<ul style="list-style-type: none"> <li>There were no signs of visible mold growth in this location.</li> <li>The airborne fungal spores (80 Count/M<sup>3</sup>), Carbon monoxide (001 ppm), and Carbon dioxide (686 ppm) should not pose environmental or exposure risks at these levels.</li> </ul>								
Recommendations								
NONE								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Room D15	2434646	NO	36.0%	75.7	941	001	7,175	
Inspected								
Ceiling Tiles	Walls	Teacher's Desks	Student Desks	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Sinks
2x4'	CMU and drywall	1	22	2	10	1	1	1
NO	NO	NO	NO	NO	NO	NO	NO	NO
Observation Notes								
<ul style="list-style-type: none"> <li>There were no signs of visible mold growth in this location.</li> <li>The discolorations on the underside of the U-shaped table were found to be cosmetic damage.</li> <li>The airborne fungal spores (160 Count/M<sup>3</sup>), Carbon monoxide (001 ppm), and Carbon dioxide (941 ppm) should not pose environmental or exposure risks at these levels.</li> </ul>								
Recommendations								
NONE								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Outdoors	2434651	N/A	25.9%	67.2	478	001	N/A	
Observation Notes								
<ul style="list-style-type: none"> <li>The total spore count was 1,200 Count/M<sup>3</sup> with the prominent genera detected being Basidiospores and Smuts/Myxomycetes at 400 Count/M<sup>3</sup> each, and Aspergillus/Penicillium at 200 Count/M<sup>3</sup>.</li> </ul>								

## 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<sup>3</sup> 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



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

Project Number: 6501 Lowland Drive  
 P.O. Number:  
 Project Name: Highland Park Elementary School  
 Collected Date: 4/3/2019  
 Received Date: 4/4/2019 9:35:00 AM

SanAir ID Number  
 19015851  
 FINAL REPORT  
 4/5/2019 4:39:22 PM

Analyst: Shepperson, Josh

### Air Cassette Analysis

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

SanAir ID Number	19015851-001			19015851-002			19015851-003			19015851-004		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2434626			2434645			2434642			2434636		
Sample Identification	Room B12			Room B14			Room C10			Room C04		
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/M <sup>3</sup>			40 Count/M <sup>3</sup>			40 Count/M <sup>3</sup>			40 Count/M <sup>3</sup>		
Background Density	2			2			2+			1+		
<b>Other</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>
Dander	25	1000	n/a	25	1000	n/a	80	3200	n/a	11	440	n/a
Fibers	1	40	n/a	5	200	n/a	9	360	n/a	1	40	n/a
Mycelial Fragments												
Pollen												
<b>Fungal Identification</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>
Ascospores												
Aspergillus/Penicillium	1	40	33				4	160	67	2	80	67
Basidiospores	2	80	67	1	40	>99	2	80	33			
Cladosporium species												
Curvularia species												
Epicoccum species										1	40	33
Smuts/Myxomycetes												
<b>TOTAL</b>	<b>3</b>	<b>120</b>		<b>1</b>	<b>40</b>		<b>6</b>	<b>240</b>		<b>3</b>	<b>120</b>	

Signature:

Date: 4/5/2019

Reviewed:

Date: 4/5/2019



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Analyst: Shepperson, Josh

### Air Cassette Analysis

*ND - None Detected. Blank spaces indicate no spores detected.*

SanAir ID Number	19015851-005			19015851-006			19015851-007		
Analysis Using STL	107C			107C			107C		
Sample Number	2434641			2434646			2434651		
Sample Identification	Room D21			Room D15			Outdoors		
Sample Type	Air Cassette - Micro-5			Air Cassette - Micro-5			Air Cassette - Micro-5		
Volume	25 Liters			25 Liters			25 Liters		
Analytical Sensitivity	40 Count/M <sup>3</sup>			40 Count/M <sup>3</sup>			40 Count/M <sup>3</sup>		
Background Density	2			2+			2		
<b>Other</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>
Dander	31	1240	n/a	147	5880	n/a	2	80	n/a
Fibers	2	80	n/a	16	640	n/a			
Mycelial Fragments	1	40	n/a						
Pollen							2	80	n/a
<b>Fungal Identification</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>
Ascospores							1	40	3
Aspergillus/Penicillium				1	40	25	5	200	17
Basidiospores				1	40	25	10	400	33
Cladosporium species	2	80	>99				3	120	10
Curvularia species				1	40	25			
Epicoccum species							1	40	3
Smuts/Myxomycetes				1	40	25	10	400	33
<b>TOTAL</b>	<b>2</b>	<b>80</b>		<b>4</b>	<b>160</b>		<b>30</b>	<b>1200</b>	

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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.

**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.

**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.

**Ascospores** - From the fungal Subphylum Ascomycotina. Ascospores are ubiquitous in nature and are commonly found in the outdoor environment. This class contains the "sac fungi" and yeasts. Some ascospores can be identified by spore morphology, however; some care should be exercised with regard to specific identification. They are identified on tape lifts and non-viable analysis by the fact that they have no attachment scars and are sometimes enclosed in sheaths with or without sacs. Ascomycetes may develop both sexual and asexual stages. Rain and high humidity may help asci to release, and disperse ascospores, which is why during these weather conditions there is a great increase in counts.  
*Health Effects:* This group contains possible allergens.

**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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## 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.*

**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 bronchospasms, 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.

**Epicoccum species** - It is found in plants, soil, grains, textiles, and paper products. Frequently isolated from air and occasionally occurs in house dust. Is a saprophyte and considered a weakly parasitic secondary invader of plants, moldy paper and textiles. Epicoccum is usually isolated with either Cladosporium species or Aureobasidium species.

**Health Effects:** A common allergen. It also has the potential to produce type I fungal hypersensitivity reactions.

**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/Recommendations**

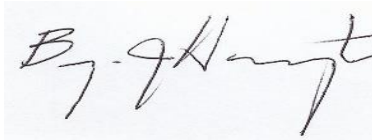
No visible mold growth was detected in the six test locations. The trace levels of airborne mold spores in the six test locations should not pose environmental or exposure risks.

The water damaged ceiling tiles in Room C04 should be removed and replaced as needed.

The Carbon dioxide level in Room C10 should be reduced by increasing air movement and/or 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)\**