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	Stephen Decatur Middle School 120,070 Ft^2	Zack Butcher Certified Indoor Environmentalist Environmental Solutions, Inc. 6114 Drum Point Rd Deale, MD 20751 410-867-6262 zack@esi4u.com

Property Location

8200 Pinewood Drive, Clinton, MD 20735

Date of Inspection: 4/26/2019

Prepared By: Zack Butcher

Certified Indoor Environmentalist (CIE)

Dear Mr. Baylor,

The results of the inspection and testing performed at Stephen Decatur Middle 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 04/29/2019 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 Historically elevated levels of humidity, condensation from pipes, periodic steam leaks and outdated HVAC systems, may have contributed to water damage ceiling tiles and colonization of mold spores in various area of the school.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 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 hazards in 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.	
32	2434593	N/A	55.6%	69.9°	732	0.00	8,200	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	0	2	2	0	4	0
NO	NO	NO	N/A	NO	NO	N/A	NO	N/A
Inspected								
• The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 320 spores/M³ of breathable air space.								
Recommendations								
• None								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
8	2434594	N/A	49.3%	69.4°	754	0.00	4,500	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	12	0	6	0	4	2
YES	NO	NO	NO	N/A	NO	N/A	YES	NO
Observation Notes								
• There was dust and debris on the diffuser grills. • There were rust stains on the ceiling tile grid. • The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 40 spores/M³ of breathable air space.								
Recommendations								
• Clean diffuser grills with an antimicrobial to remove dust and debris. • Clean rust stained ceiling tile grid to remove discolorations.								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
5	2434595	N/A	61.5%	71.9°	1,182	0.00	8,300	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU+ W/B	1	36	7	4	0	4	0
NO	NO	NO	NO	NO	NO	N/A	YES	N/A

Observation Notes

- There was dust and debris on the diffuser grills.
- The Carbon Dioxide (CO2) level in this room was slightly elevated at 1,182 ppm (parts per million).
- The indoor air quality should not pose any health or environmental concerns, as there were no fungi identified in the breathable air space.

Recommendations

- Clean diffuser grills with an antimicrobial to remove dust and debris.
- 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.	
50	2434596	N/A	56.2%	74.1°	649	0.00	12,000	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	2	7	6	0	4	0
YES	NO	NO	NO	NO	YES	N/A	YES	N/A

Observation Notes

- There was dust and debris on the diffuser grills and on ceiling tiles surrounding the diffusers.
- There was visible suspected microbial growth on the inside of the doors on some of the sink cabinetry. There was also evidence of previous water activity in some of the sink cabinetry.
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 200 spores/M³ of breathable air space.

Recommendations

- Clean diffuser grills with an antimicrobial to remove dust and debris.
- Clean dust and debris from the ceiling tiles surrounding the diffusers. If they can not be sufficiently cleaned, remove, discard, and replace them.
- HEPA vacuum, then damp-wipe the sink cabinetry with an anti-microbial agent to remove water staining and suspected microbial contamination.
- Ensure there are no active leaks from the sink.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
33	2434597	N/A	52.1%	72.6°	709	0.00	8,700	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	9	8	4	0	4	0
YES	NO	NO	NO	NO	NO	N/A	YES	N/A

Observation Notes

- There were approximately 6-7 water stained ceiling tiles.
- There was dust and debris on the diffuser grills.
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 40 spores/M³ of breathable air space.

Recommendations

- Remove, discard, and replace the 6-7 water stained ceiling tiles.
- Clean diffuser grills with an antimicrobial to remove dust and debris.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
10	2434598	N/A	54.4%	72.6°	1,003	0.00	8,300	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	30	2	5	0	4	0
YES	NO	NO	NO	NO	NO	N/A	YES	N/A

Observation Notes

- There were 2 water stained ceiling tiles.
- There was dust and debris on the diffuser grills.
- The Carbon Dioxide (CO2) level in this room was slightly elevated at 1,003 ppm (parts per million).
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 120 spores/M³ of breathable air space.

Recommendations

- Remove, discard, and replace the 2 water stained ceiling tiles.
- Clean diffuser grills with an antimicrobial to remove dust and debris.
- 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.	
65	2434599	N/A	57.4%	73.9°	755	0.00	6,700	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	30	2	5	0	4	4
YES	NO	NO	N/A	NO	NO	N/A	YES	NO

Observation Notes

- There was dust, debris, and rust stains on the diffuser grills.
- Most of the ceiling tiles were sagging. This is most likely due to elevated relative humidity during the warmer months of the year.
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 320 spores/M³ of breathable air space.

Recommendations

- Clean the diffuser grills with an antimicrobial to remove dust, debris, and discolorations.
- Remove, discard, and replace the sagging ceiling tiles.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
60	2434600	N/A	64.6%	74.4°	940	0.00	6,700	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	0	20	3	0	4	4
YES	NO	N/A	N/A	N/A	NO	N/A	YES	NO

Observation Notes

- Most of the ceiling tiles were sagging. This is most likely due to elevated relative humidity during the warmer months of the year.
- The relative humidity was <60%. Normal conditions are between 30-50% relative humidity. However, the window was open, which may have contributed to the elevated relative humidity.
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 800 spores/M³ of breathable air space.

Recommendations

- Remove, discard, and replace the sagging ceiling tiles.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
26	2434601	N/A	54.3%	70.1°	905	0.00	8,100	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	26	1	3	0	4	2
YES	NO	NO	NO	NO	NO	N/A	YES	NO

Observation Notes

- Most of the ceiling tiles were sagging. This is most likely due to elevated relative humidity during the warmer months of the year.
- There was dust, debris, and rust stains on the diffuser grills.
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 40 spores/M³ of breathable air space.

Recommendations

- Remove, discard, and replace the sagging ceiling tiles.
- Clean the diffuser grills with an antimicrobial to remove dust and debris.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
21	2434602	N/A	58.4%	70.1°	1,462	0.00	8,300	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU+ W/B	1	30	4	4	0	4	1
NO	NO	NO	NO	NO	NO	NO	YES	NO

Observation Notes

- There was dust and debris on the diffuser grills.
- The Carbon Dioxide (CO2) level in this room was elevated at 1,462 ppm (parts per million).
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 120 spores/M³ of breathable air space.

Recommendations

- Clean the diffuser grills with an antimicrobial to remove dust and debris.
- 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.	
45	2434603	N/A	49.3%	69.0°	809	0.00	17,500	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	0	19	0	0	4	0
YES	NO	NO	N/A	NO	N/A	N/A	YES	N/A

Observation Notes

- Most of the ceiling tiles were sagging. This is most likely due to elevated relative humidity during the warmer months of the year.
- There was dust and debris on the diffuser grills.
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 280 spores/M³ of breathable air space.

Recommendations

- Remove, discard, and replace the sagging ceiling tiles.
- Clean the diffuser grills with an antimicrobial to remove dust and debris.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
40	2434604	N/A	62.8%	69.8°	1,146	0.00	10,300	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	**OTHER**
2x4	CMU	1	0	8	6	0	8	0
YES	NO	NO	N/A	NO	NO	N/A	YES	N/A

Observation Notes

- Most of the ceiling tiles were sagging. This is most likely due to elevated relative humidity during the warmer months of the year.
- There was dust and debris on the diffuser grills.
- There were 3 water stained ceiling tiles.
- The Carbon Dioxide (CO2) level in this room was slightly elevated at 1,146 ppm (parts per million).
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 280 spores/M³ of breathable air space.

Recommendations

- Remove, discard, and replace the sagging and 3 water stained ceiling tiles.
- Clean the diffuser grills with an antimicrobial to remove dust and debris.
- 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.
Outside	2434592		75.2%	68.1°			
Observation Notes							
• The total fungal ecology in the breathable air space of the outdoor control sample was 1,200 spores/M³ of breathable air space.							

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.

Lab Results

SanAir Technologies Laboratory

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

Project Number: 8200 Pinewood Drive
P.O. Number: JZB
Project Name: Stephen Decatur Middle School
Collected Date: 4/26/2019
Received Date: 4/29/2019 9:00:00 AM

SanAir ID Number
19020172
FINAL REPORT
4/30/2019 4:55:30 PM

Analyst: Martin, Brice

Air Cassette Analysis

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

SanAir ID Number	19020172-001			19020172-002			19020172-003			19020172-004		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2434592			2434593			2434594			2434595		
Sample Identification	Control-Outside			Room 32			Room 8			Room 5		
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	1+			1+			1+			2		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Dander				28	1120	n/a	7	280	n/a	64	2560	n/a
Fibers				2	80	n/a				3	120	n/a
Mycelial Fragments												
Pollen	1	40	n/a									
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Alternaria species												
Ascospores	8	320	27									
Aspergillus/Penicillium				6	240	75						
Basidiospores	18	720	60				1	40	>99			
Cladosporium species	4	160	13	2	80	25						
Epicoccum species												
TOTAL	**30**	**1200**		**8**	**320**		**1**	**40**				

Signature: Brice Martin Date: 4/30/2019 Reviewed: Johnathan Wilson Date: 4/30/2019

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Air Cassette Analysis

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SanAir ID Number	19020172-005			19020172-006			19020172-007			19020172-008		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2434596			2434597			2434598			2434599		
Sample Identification	Room 50			Room 33			Room 10			Room 65		
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	1+			1+			2			1+		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Dander	7	280	n/a	21	840	n/a	32	1280	n/a	17	680	n/a
Fibers				6	240	n/a	4	160	n/a			
Mycelial Fragments												
Pollen												
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Alternaria species												
Ascospores							1	40	33	1	40	13
Aspergillus/Penicillium	1	40	20							1	40	13
Basidiospores	2	80	40	1	40	>99				2	80	25
Cladosporium species	2	80	40				2	80	67	4	160	50
Epicoccum species												
TOTAL	**5**	**200**		**1**	**40**		**3**	**120**		**8**	**320**	

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Air Cassette Analysis

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SanAir ID Number	19020172-009			19020172-010			19020172-011			19020172-012		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2434600			2434601			2434602			2434603		
Sample Identification	Room 60			Room 26			Room 21			Room 45		
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			1+			2+			2		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Dander	28	1120	n/a	5	200	n/a	227	9080	n/a	25	1000	n/a
Fibers	2	80	n/a				9	360	n/a	1	40	n/a
Mycelial Fragments												
Pollen	1	40	n/a				2	80	n/a			
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Alternaria species							1	40	33			
Ascospores	7	280	35				1	40	33	1	40	14
Aspergillus/Penicillium	4	160	20							2	80	29
Basidiospores	4	160	20	1	40	>99				1	40	14
Cladosporium species	5	200	25				1	40	33	3	120	43
Epicoccum species												
TOTAL	**20**	**800**		**1**	**40**		**3**	**120**		**7**	**280**	

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Analyst: Martin, Brice

Air Cassette Analysis

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SanAir ID Number	19020172-013		
Analysis Using STL	107C		
Sample Number	2434604		
Sample Identification	Room 40		
Sample Type	Air Cassette - Micro-5		
Volume	25 Liters		
Analytical Sensitivity	40 Count/M³		
Background Density	2+		
Other	**Raw Count**	**Count/M³**	**%**
Dander	163	6520	n/a
Fibers	9	360	n/a
Mycelial Fragments	1	40	n/a
Pollen			
Fungal Identification	**Raw Count**	**Count/M³**	**%**
Alternaria species			
Ascospores	1	40	13
Aspergillus/Penicillium	2	80	25
Basidiospores	4	160	50
Cladosporium species			
Epicoccum species	1	40	13
TOTAL	**8**	**320**	

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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.

Alternaria species - This genus compromises a large number of saprobes and plant pathogens. It is one of the predominate airborne fungal spores indoor and outdoor. Outdoors it may be isolated from samples of soil, seeds, and plants. It is one of the more common fungi found in nature, extremely widespread and ubiquitous. Conidia are easily carried by the wind, with peak concentrations in the summer and early fall. It is commonly found in outdoor samples. It is often found in indoor environments, on drywall, ceiling tiles, in house dust, carpets, textiles, and on horizontal surfaces in building interiors. Often found on window frames.
Health Effects: In humans, it is recognized to cause type I and III allergic responses. Because of the large size of the spores, it can be deposited in the nose, mouth and upper respiratory tract, causing nasal septum infections. It has been known to cause Baker's asthma, farmer's lung, and hay fever. It has been associated with hypersensitivity pneumoniti, sinusitis, deratomycosis, onychomycosis, subcutaneous phaeohyphomycosis, and invasive infection. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchiospasms, chronic cases may develop pulmonary emphysema.
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.

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 excercised 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 dispurse ascospores, which is why during these weather conditions there is a great increase in counts.
Health Effects: This group contains possible allergens.

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P.O. Number: JZB
Project Name: Stephen Decatur Middle School
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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.

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.

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.

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.

Conclusions/Recommendations

The samples in this report do not indicate elevated concentrations of aerosolized mold spores detected in the breathable air space of the test locations.

However, several rooms still need attention. This is mainly due to water stained, sagging, or discolored ceiling tiles, dust and debris on convector units or diffusers, water damage in sink cabinets, and slightly elevated levels of CO2. Please refer to all the recommendations listed above.

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

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)**