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	Kettering Middle School 120,800 Ft^2	Vinny Gigliotti Certified Indoor Environmentalist Environmental Solutions, Inc. 6114 Drum Point Rd Deale, MD 20751 410-867-6262 Vinny@esi4u.com

Property Location

65 Herrington Drive, Upper Marlboro, MD 20774

Date of Inspection: 5/2/2019

Prepared By: Vinny Gigliotti & Ryan Fitzgerald

Certified Indoor Environmentalist (CIE)

Dear Mr. Baylor,

The results of the inspection and testing performed at Kettering 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 5/2/2019 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 Historically elevated levels of humidity, condensation from pipes, periodic steam leaks and outdated HVAC systems, may have contributed to water damage ceiling tiles and colonization of mold spores in various area of the school.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 / 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. Please note, the total cubic feet of air per room is an approximate number.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Classroom #141	2428519	No	54.9	74.6	851	0000	10,500	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	0	14	6	0	4	0
No	No	No	N/A	No	No	N/A	No	N/A

Observation Notes

- Accumulations of dust was seen on the contents in the closet.
- The sink cabinetry was inaccessible during the time of the inspection.
- The indoor air quality should not pose environmental or exposure risks at these levels. The total spore count was 80 Count/M^3 and no elevated levels of Carbon monoxide or Carbon dioxide were detected.

Recommendations

None

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Classroom #138	2428524	No	62.8	72.5	**1,038**	000	12,768	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	0	10	2	1	4	1
No	No	No	N/A	No	No	No	No	No

Inspected

- Accumulations of dust was seen on the surfaces and chairs throughout the room.
- The Carbon Dioxide CO2 level in this room was slightly elevated at 1,038 ppm.
- The total spore count was 200 Count/M^3 and should not pose environmental or exposure risks at these levels.

Recommendations

- To reduce Carbon dioxide (CO2) levels, increase air exchange within this room. 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.	
Classroom #150	2428510	No	57.6	74.3	970	000	8,073	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU/S	2	0	6	3	0	6	0
Yes	No	No	N/A	No	No	N/A	No	N/A

Observation Notes

- Four ceiling tiles were water stained.
- Light accumulations of dust were seen on the diffusors.
- The indoor air quality should not pose environmental or exposure risks at these levels. The total spore count was 80 Count/M^3 and no elevated levels of Carbon monoxide or Carbon dioxide were detected.

Recommendations

- Remove and replace the water damaged ceiling tiles. The contaminated ceiling tiles should be placed in a sealed plastic bag for disposal.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Classroom #102	2428505	No	51.8	69.9	**1,449**	000	11,200	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	33	1	1	1	4	1
No	No	No	No	No	No	No	No	No

Observation Notes

- There were no signs of visible mold growth or elevated levels of moisture detected within this location.
- The Carbon Dioxide CO2 level in this room was slightly elevated at 1,449 ppm. The CO2 level may have been increased due to the room being recently being occupied.
- The total spore count was 160 Count/M^3 and should not pose environmental or exposure risks at these levels.

Recommendations

- To reduce Carbon dioxide (CO2) levels, increase air exchange within this room. 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.	
Classroom #114	2428500	No	57.6	68.7	**1,486**	000	8,120	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU/D	1	28	2	2	0	4	0
No	No	No	No	No	No	N/A	No	N/A

Observation Notes

- Rust and debris were on one diffusor and the ceiling grid around the diffusor.
- The Carbon Dioxide CO2 level in this room was slightly elevated at 1,486 ppm. The CO2 level may have been increased due to the room being occupied.
- The total spore count was 40 Count/M^3 and should not pose environmental or exposure risks at these levels.

Recommendations

- To reduce Carbon dioxide (CO2) levels, increase air exchange within this room. 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.	
Classroom #111	2428535	No	54.3	69.6	**1,320**	000	8,680	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU/D	0	0	14	1	0	4	0
No	No	N/A	N/A	No	No	N/A	No	N/A

Observation Notes

- There were no signs of visible mold growth or elevated levels of moisture detected within this location.
- The Carbon Dioxide CO2 level in this room was slightly elevated at 1,486 ppm. The CO2 level may have been increased due to the room being recently occupied.
- The total spore count was 80 Count/M^3 and should not pose environmental or exposure risks at these levels.

Recommendations

- To reduce Carbon dioxide (CO2) levels, increase air exchange within this room. 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.	
Classroom #117	2396070	No	59.3	69.6	994	000	8,120	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU/D	2	32	1	2	1	4	1
No	No	No	No	No	No	No	No	No

Observation Notes

- There were no signs of visible mold growth or elevated levels of moisture detected within this location.
- The indoor air quality should not pose environmental or exposure risks at these levels. The total spore count was 880 Count/M^3 and no elevated levels of Carbon monoxide or Carbon dioxide were detected.

Recommendations

None

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Classroom #167	2396071	**Yes**	69.8	71.7	**1,148**	000	7,038	
Inspected								
Ceiling Tiles	Walls	Teacher s Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	Sheetrock	1	36	2	2	2	0	2
Yes	**Yes**	No	No	No	No	No	N/A	No

Observation Notes

- The ceiling tiles were sagging.
- Two ceiling tiles were water stained.
- The Carbon Dioxide CO2 level in this room were slightly elevated at 1,148 ppm. The CO2 level may have been increased due to the room being recently occupied.
- There was visible microbial growth on the base of the left wall (near the A/C wall units). A surface swab was collected from the left wall for Direct Identification Analysis. The Analysis indicates the presence of "Light" Stachybotrys and "Rare" Smuts/Myxomycetes, Chaetomium, and Cladosporium Species.
- The total spore count was 2,320 Count/M^3 and should not pose environmental or exposure risks at these levels. Please note the Cladosporium levels are lower than the outdoor control sample. Please refer to the Air Cassette Analysis report for specific results.

Recommendations

- Remove and replace the water damaged ceiling tiles. The contaminated ceiling tiles should be placed in a sealed plastic bag for disposal.
- To reduce Carbon dioxide (CO2) levels, increase air exchange within this room. Ventilating or circulating the air with a fan will also reduce Carbon dioxide (CO2) levels.
- Monitor the relative humidity during warm/humid summer months to prevent the ceiling tiles from sagging.
- Remove and discard the contaminated sheetrock a minimum of 24 inches from the floor up. The contaminated sheetrock should be placed in a sealed plastic bag for disposal. HEPA vacuum, spray antimicrobial, then damp wipe microbial growth from the wall cavity.
- Engage HEPA filtered air scrubber in this location for approximately 4-6 hours.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Classroom #166	2428509	**Yes**	59.8	71.2	**2,867**	001	7,452	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	Sheetrock	1	36	2	3	2	0	2
Yes	**Yes**	No	No	No	No	No	N/A	No

Observation Notes

- The ceiling tiles were sagging.
- Three ceiling tiles were water stained.
- The Carbon Dioxide CO2 level in this room were elevated at 2,867 ppm. The CO2 level may have been increased due to the room being recently occupied.
- There was visible microbial growth on the base of the right wall (near the A/C wall units) and front wall. A surface swab was collected from the right wall for Direct Identification Analysis. The Analysis indicates the presence of "Moderate" Chaetomium Species and "Rare" Aspergillus/Penicillium, Stachybotrys, and Ulocladium Species.
- The total spore count was 480 Count/M^3 and should not pose environmental or exposure risks at these levels.

Recommendations

- Remove and replace the water damaged ceiling tiles. The contaminated ceiling tiles should be placed in a sealed plastic bag for disposal.
- To reduce Carbon dioxide (CO2) levels, increase air exchange within this room. Ventilating or circulating the air with a fan will also reduce Carbon dioxide (CO2) levels.
- Monitor the relative humidity during warm/humid summer months to prevent the ceiling tiles from sagging.
- Remove the contaminated sheetrock walls a minimum of 24 inches from the floor up. The contaminated sheetrock should be placed in a sealed plastic bag for disposal. HEPA vacuum, spray antimicrobial, then damp wipe microbial growth from the wall cavities.
- Engage HEPA filtered air scrubber in this location for approximately 4-6 hours.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Classroom #161	2428533	No	68.1	71.9	**2,060**	000	7,452	
Inspected								
Ceiling Tiles	Walls	Teacher s Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	Sheetrock	0	0	15	2	2	0	2
Yes	**Yes**	N/A	N/A	No	No	No	N/A	No

Inspected

- The ceiling tiles were sagging.
- Three ceiling tiles were water stained.
- The Carbon Dioxide CO2 level in this room were elevated at 2,060 ppm. The CO2 level may have been increased due to the room being recently occupied.
- There was suspected microbial growth on the base of the right wall (near the A/C wall units) and front wall.
- The total spore count was 320 Count/M^3 and should not pose environmental or exposure risks at these levels.

Recommendations

- To reduce Carbon dioxide (CO2) levels, increase air exchange within this room. Ventilating or circulating the air with a fan will also reduce Carbon dioxide (CO2) levels.
- Monitor the relative humidity during warm/humid summer months to prevent the ceiling tiles from sagging.
- Remove the contaminated sheetrock a minimum of 24 inches from the floor up. The contaminated sheetrock should be placed in a sealed plastic bag for disposal. HEPA vacuum, spray antimicrobial, then damp wipe microbial growth from the wall cavity.
- Engage HEPA filtered air scrubber in this location for approximately 4-6 hours.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Classroom #124	2428543	No	66.7	71.7	**1,578**	000	8,120	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	33	3	2	1	4	1
No	No	No	No	No	No	No	No	No

Observation Notes

- Light dust was seen on the diffusors.
- The Carbon Dioxide CO2 level in this room were elevated at 1,578 ppm. The CO2 level may have been increased due to the room being occupied.
- The total spore count was 240 Count/M^3 and should not pose environmental or exposure risks at these levels.

Recommendations

- To reduce Carbon dioxide (CO2) levels, increase air exchange within this room. 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.	
Classroom #126	**2428514**	**Yes**	68.4	72.5	**1,628**	001	12,400	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	27	0	6	0	4	0
No	No	No	No	N/A	**Yes**	N/A	No	N/A

Observation Notes

- Dust and debris were seen on the drop ceiling grid.
- Light accumulations of dust were on the diffusors.
- The Carbon Dioxide CO2 level in this room were elevated at 1,628 ppm. The CO2 level may have been increased due to the room being recently occupied.
- There was visible microbial growth on the inside of the sink cabinetries. A surface swab was collected from the middle rear sink cabinetry for Direct Identification Analysis. The Analysis indicates the presence of "Light" Chaetomium Species.
- The indoor air quality had elevated levels of Aspergillus / Penicillium at **1,880** spores per cubic meter of air.

Recommendations

- To reduce Carbon dioxide (CO2) levels, increase air exchange within this room. Ventilating or circulating the air with a fan will also reduce Carbon dioxide (CO2) levels.
- HEPA vacuum, spray antimicrobial, then damp wipe microbial growth from the sink cabinetries. If the cabinetry cannot be properly cleaned, it should be removed and discarded under proper environmental controls.
- Engage HEPA filtered air scrubber in this location for approximately 4-6 hours. Damp wipe all horizontal surfaces with an antimicrobial, then fog the breathable air space.

Interpretation of Lab Results

In the enclosed Air Cassette Analysis report, you will notice Fungal Identification, which is the species 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.

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: 65 Herrington Drive
P.O. Number:
Project Name: Kettering MS
Collected Date: 5/2/2019
Received Date: 5/3/2019 9:25:00 AM

SanAir ID Number
19021119
FINAL REPORT
5/6/2019 1:45:48 PM

Analyst: Shepperson, Josh

Air Cassette Analysis

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

SanAir ID Number	19021119-001			19021119-002			19021119-003			19021119-004		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2428519			2428524			2428510			2428505		
Sample Identification	Classroom #141			Classroom #138			Classroom #150			Classroom #102		
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			1+			2		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Dander	9	360	n/a	31	1240	n/a	9	360	n/a	36	1440	n/a
Fibers	2	80	n/a	6	240	n/a				3	120	n/a
Mycelial Fragments												
Pollen	1	40	n/a	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												
Aspergillus/Penicillium	1	40	50	4	160	80	2	80	>99	1	40	25
Basidiospores	1	40	50									
Cladosporium species				1	40	20				1	40	25
Curvularia species												
Epicoccum species												
Oidium species												
Peronospora species												
Polythrincium species												
Smuts/Myxomycetes										2	80	50
TOTAL	**2**	**80**		**5**	**200**		**2**	**80**		**4**	**160**	

Signature: Date: 5/3/2019 Reviewed: Date: 5/6/2019

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Analyst: Shepperson, Josh

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SanAir ID Number	19021119-005			19021119-006			19021119-007			19021119-008		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2428500			2428535			2396070			2396071		
Sample Identification	Classroom #114			Classroom #111			Classroom #117			Classroom #167		
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+			1+			2		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Dander	38	1520	n/a	6	240	n/a	3	120	n/a	46	1840	n/a
Fibers	3	120	n/a	1	40	n/a				3	120	n/a
Mycelial Fragments										1	40	n/a
Pollen							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**	**%**
Alternaria species										1	40	2
Ascospores							1	40	5	1	40	2
Aspergillus/Penicillium							1	40	5	2	80	3
Basidiospores				1	40	50	8	320	36	7	280	12
Cladosporium species	1	40	>99				12	480	55	36	1440	62
Curvularia species										1	40	2
Epicoccum species				1	40	50						
Oidium species												
Peronospora species												
Polythrincium species										1	40	2
Smuts/Myxomycetes										9	360	16
TOTAL	**1**	**40**		**2**	**80**		**22**	**880**		**58**	**2320**	

Signature: Date: 5/3/2019 Reviewed: Date: 5/6/2019

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Analyst: Shepperson, Josh

Air Cassette Analysis

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

SanAir ID Number	19021119-009			19021119-010			19021119-011			19021119-012		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2428509			2428533			2428543			2428514		
Sample Identification	Classroom #166			Classroom #161			Classroom #124			Classroom #126		
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	15	600	n/a	6	240	n/a	28	1120	n/a	44	1760	n/a
Fibers	4	160	n/a				2	80	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	8	1	40	13						
Aspergillus/Penicillium	1	40	8				5	200	83	47	1880	98
Basidiospores	2	80	17							1	40	2
Cladosporium species	8	320	67	7	280	88	1	40	17			
Curvularia species												
Epicoccum species												
Oidium species												
Peronospora species												
Polythrincium species												
Smuts/Myxomycetes												
TOTAL	**12**	**480**		**8**	**320**		**6**	**240**		**48**	**1920**	

Signature: Date: 5/3/2019 Reviewed: Date: 5/6/2019

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5/6/2019 1:45:48 PM

Analyst: Shepperson, Josh

Air Cassette Analysis

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SanAir ID Number	19021119-013		
Analysis Using STL	107C		
Sample Number	2428529		
Sample Identification	Outdoor-Control		
Sample Type	Air Cassette - Micro-5		
Volume	25 Liters		
Analytical Sensitivity	40 Count/M³		
Background Density	2		
Other	**Raw Count**	**Count/M³**	**%**
Dander			
Fibers			
Mycelial Fragments			
Pollen	22	880	n/a
Fungal Identification	**Raw Count**	**Count/M³**	**%**
Alternaria species			
Ascospores	11	440	7
Aspergillus/Penicillium	28	1120	17
Basidiospores	69	2760	42
Cladosporium species	51	2040	31
Curvularia species			
Epicoccum species			
Oidium species	1	40	< 1
Peronospora species	2	80	1
Polythrincium species			
Smuts/Myxomycetes	2	80	1
TOTAL	**164**	**6560**	

Signature: Date: 5/3/2019 Reviewed: Date: 5/6/2019

Direct ID Lab Results

SanAir Technologies Laboratory

SanAir ID Number
19021119
FINAL REPORT
5/6/2019 1:45:48 PM

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

Project Number: 65 Herrington Drive
P.O. Number:
Project Name: Kettering MS
Collected Date: 5/2/2019
Received Date: 5/3/2019 9:25:00 AM

Analyst: Shepperson, Josh

Direct Identification Analysis

SanAir ID: 19021119-014 Sample #:Swab Classroom #167-Left Wall

D1 - Direct Identification Analysis on Surface Swab using STL 104

Direct ID of Mold

Fungi	Estimated Amount
Chaetomium species	Rare
Cladosporium species	Rare
Smuts/Myxomycetes	Rare
Stachybotrys species	Light

SanAir ID: 19021119-015 Sample #:Swab Classroom #166-Right Wall

D1 - Direct Identification Analysis on Surface Swab using STL 104

Direct ID of Mold

Fungi	Estimated Amount
Aspergillus/Penicillium	Rare
Chaetomium species	Moderate
Stachybotrys species	Rare
Ulocladium species	Rare

SanAir ID: 19021119-016 Sample #:Swab Classroom #126-Middle Rear Sink Cabinetry

D1 - Direct Identification Analysis on Surface Swab using STL 104

Direct ID of Mold

Fungi	Estimated Amount
Chaetomium species	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: Date: 5/3/2019

Reviewed: Date: 5/6/2019

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

Project Number: 65 Herrington Drive
P.O. Number:
Project Name: Kettering MS
Collected Date: 5/2/2019
Received Date: 5/3/2019 9:25:00 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.

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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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.

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.

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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.

Oidium species - This is an obligate plant pathogen causing a disease known as "powdery mildew." It is an anamorph of Erysiphe.
References: Kendrick, Bryce. The Fifth Kingdom, 3rd Edition. Newburyport, MA: Focus Publishing, 2000.

Peronospora species - This is an obligate plant pathogen known as downy mildew.
References: Kendrick, Bryce. The Fifth Kingdom, 3rd Edition. Newburyport, MA: Focus Publishing, 2000.

Polythrincium species - This fungus is often associated with leaves and other plant material. There are no reports of any clinical significance or allergenic properties.
References: Ellis, Martin B., Ellis, Pamela, Microfungi on Land Plants: An Identification Handbook. England, The Richmond Publishing Co. Ltd., 1997.

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.

Stachybotrys species - This organism is rarely found in outdoor samples. It is usually difficult to find in indoor air samples unless it is physically disturbed because the spores are in a gelatinous mass. Grows well on wet media, preferably containing cellulose. It proliferates in the indoor environment with long term water damage, growing on wallpaper, gypsum board, and textiles. As a general rule, air cultures for Stachybotrys yields unpredictable results, mainly due to the fact that this fungus is usually accompanied by other fungi such as Aspergillus and Penicillium that normally are better aerosolized than Stachybotrys. This is a slow growing fungus on media. It does not compete well with other rapidly growing fungi. The black fungi grow on building material with high cellulose content and low nitrogen content. Appropriate media for the growth of this organism will have high cellulose content and low nitrogen content.
Health Effects: It has worldwide distribution and has been reported to cause dermatitis, cough, rhinitis, and headache, although no definitive reports of human infections have been verified. It has the ability to cause type I hypersensitivity. It is a documented mycotoxin producer.
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.

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Ulocladium species - Isolated from soil, dead plants and cellulose materials. Found on textiles. It can be found on many types of materials, but mostly found on decaying materials. Has a greater water activity need for growth and is therefore considered a water indicator organism.
Health Effects: Reported to be a major allergen. Rarely causes subcutaneous infections in humans. It has a high water requirement.
References: De Hoog, G.S., J. Guarro, J. Gene, and M.J. Figueras. Atlas of Clinical Fungi, 2nd Edition. The Netherlands: CBS, 2000.

Conclusions/Recommendations

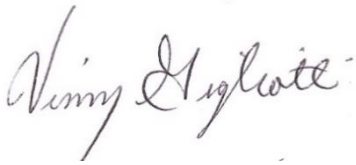
Visible microbial growth was present in Classrooms # 161, 166 and 167, located in the upper right wing of the school. The visible growth was predominately along the exterior sheetrock walls of the rooms, near the A/C wall units. The other classrooms in this wing of the school were inaccessible during the inspection due to the students testing; however, the other classrooms in this wing should be further evaluated and the instructions listed above should be followed if microbial growth is discovered in the other classrooms. The ceiling tiles were also sagging in the accessible classrooms of this wing, which is an indication of humidity concerns.

Visible microbial growth was also sighted in several of the sink cabinetries in Classroom #126. This classroom also contained elevated airborne mold spores. Please see the recommendations above for additional information.

In addition, elevations of CO2 were detected in most of the classrooms assessed. This may have been due to the rooms being occupied or recently occupied. The CO2 levels should be monitored, and the recommendations should be followed 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,



Vinny Gigliotti (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)**