



Environmental Consultants and Engineers

1818 New York Avenue Suite 217  
Washington, DC 20002

[www.globalincusa.net](http://www.globalincusa.net)

May 22, 2019

Prince Georges County  
Environmental Safety Office  
13306 Old Marlboro Pike  
Upper Marlboro, MD 20772

Attention: Mr. Alex Baylor

RE: Indoor Air Quality Screening

Global Project Number: 19-015  
School: Arrowhead Elementary School

Dear Mr. Baylor,

On May 20, 2019, Global Inc.'s (GLOBAL) Certified Industrial Hygienist, Ms. Lauren Kesslak, conducted an Indoor Air Quality Screening at Arrowhead Elementary School located at 2462, 2300 Sansbury Rd, Upper Marlboro, MD 20774.

### **Methodology**

The IAQ evaluation included a visual assessment, sampling for non-viable mold spores in air, and measurement of comfort parameters (temperature, humidity, carbon dioxide, and carbon monoxide) in randomly selected representative locations within the building. During the visual assessment of representative locations, and when noted, GLOBAL documented those areas with suspected mold growth, water intrusions, and wet conditions that have the potential to lead to mold growth. GLOBAL also noted any unusual odors. At least one microbial air sample was collected for every 10,000 Square Feet (SF) of space in the building and the analytical results for the interior spaces were compared to an outdoor (ambient) sample collected on the same day.

Microbial samples (including a field blank for quality control) were delivered under strict chain-of-custody procedures were to Hayes Microbial Consulting - an AIHA EMPAT-certified laboratory in Midlothian, Virginia for analysis by microscopy. The sample chain-of-custody and laboratory report is attached.

### **Observations and Results**

GLOBAL's inspector conducted a walkthrough with Prince Georges County Public School (PGCPS) personnel present. Rooms were selected in a random manner throughout the building so as to prevent sampling bias.



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### ***Mold-in-Air Samples***

There are no definitive regulations or standardized guidelines for addressing airborne mold in an indoor setting. If building systems (ventilation, envelope) are functioning properly, the indoor fungal ecology profile should be consistent with what is encountered outdoors and the spore concentrations should be below the ambient levels. Laboratory analytical results are attached at the end of this report.

### ***Temperature***

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) have published recommendations for year-round acceptable temperatures in Standard 55-2016 (*Thermal Environmental Conditions for Human Occupancy*). The summer comfort range is 73 to 79°F. It is important to note that ASHRAE standards are intended as a suggested guideline as opposed to a regulation.

### ***Relative Humidity (RH)***

Relative humidity is a key factor for mold growth. Mold has the potential of growing on suitable surfaces with humidity levels above 60%. ASHRAE standard 62.1-2013 (*Ventilation for Acceptable Indoor Air Quality*) recommends a maximum indoor relative humidity of 65% to preclude the likelihood of condensation on cool surfaces encouraging mold growth. All the indoor relative humidity readings were below the ASHRAE recommended level of 65%.

### ***Carbon Monoxide***

Carbon monoxide (CO) is a colorless and odorless gas that is produced by the incomplete combustion of carbon-containing fuels. Oil, gasoline, diesel fuels, wood, coke, and coal are the major sources of CO. All registered CO concentrations were below the EPA National Ambient Air Quality Standard (NAAQS) of 9 ppm.

### ***Carbon Dioxide***

Under conditions of maximum occupancy, ASHRAE Standard 62.1-2013, Appendix C, infers that the acceptable carbon dioxide upper limit is the prevailing outdoor carbon dioxide concentration plus 700 parts per million (ppm). On May 20, 2019, the outdoor (ambient) carbon dioxide concentration was approximately 508 ppm so indoor concentrations should not exceed approximately 1208 ppm (700 + 508). All indoor carbon dioxide measurements were within the ASHRAE standards.

Observations are presented in Table 1 and testing results are presented in Table 2.



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**Table 1: Observations**

Location	Observations
Cafeteria	No issues found
306	No issues found
Home Arts	No issues found
104	No issues found
106	No issues found
100	No issues found
Gym	No issues found

**Table 2: Air Quality Results**

Sample Location	Temp °F	RH%	CO ppm	CO2 ppm	Normal Fungal Ecology?
Standards	ASHRAE 68 to 75°F	ASHRAE <65%	NAAQS <9	ASHRAE 1208	
Ambient	80.55	67.45	0	508	N/A
Cafeteria	75.6	49.05	0	591.5	Yes
306	77.95	66.2	0	722.5	Yes
Home Arts	78.55	64.3	0	593	Yes
104	78.9	53.25	0	1138.5	Yes
106	77.9	50.15	0	1523.5	Yes
100	76.5	46.85	0	817	Yes
Gym	74.9	71.5	0	1291.5	Yes



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### **Conclusions**

No indoor air quality issues related to mold were found during the screening performed on May 20, 2019, and all mold samples were found to have a normal ecology for an indoor environment.

It has been our pleasure to conduct these IAQ Screening services for the Prince Georges County Public School system. If you have any questions, please feel free to contact us.

Regards,

A handwritten signature in black ink, appearing to read "Lauren E. Kesslak".

Lauren E. Kesslak, MS, CIH, CSP  
Certified Industrial Hygienist

Analysis Report prepared for

## Global, Inc.

1818 New York Ave.  
Suite 217  
Washington, DC, 20002

Phone: (443) 691-0455

19-015  
Arrowhead ES

Collected: May 22, 2019  
Received: May 23, 2019  
Reported: May 23, 2019

We would like to thank you for trusting Hayes Microbial for your analytical needs!  
We received 5 samples by FedEx in good condition for this project on May 23rd, 2019.

The results in this analysis pertain only to this job, collected on the stated date, and should not be used in the interpretation of any other job. This report may not be duplicated, except in full, without the written consent of Hayes Microbial Consulting, LLC..

This laboratory bears no responsibility for sample collection activities, analytical method limitations, or your use of the test results. Interpretation and use of test results are your responsibility. Any reference to health effects or interpretation of mold levels is strictly the opinion of Hayes Microbial. In no event, shall Hayes Microbial or any of its employees be liable for lost profits or any special, incidental or consequential damages arising out of the use of these test results.



Steve Hayes, BSMT(ASCP)  
Laboratory Director  
Hayes Microbial Consulting, LLC.



EPA Laboratory ID: VA01419



Lab ID: #188863



NVLAP Lab Code: 500096-0



DPH License: #PH-0198

Sample Number	1	ARRO/52019-01			2	ARRO/52019-02			3	ARRO/52019-03			4	ARRO/52019-04		
Sample Name	<b>Ambient</b>			<b>306</b>			<b>Home Arts</b>			<b>104</b>						
Sample Volume	75.00 liter			75.00 liter			75.00 liter			75.00 liter						
Reporting Limit	13 spores/m <sup>3</sup>			13 spores/m <sup>3</sup>			13 spores/m <sup>3</sup>			13 spores/m <sup>3</sup>						
Background	2			2			2			2						
Fragments	13/m <sup>3</sup>			ND			ND			ND						
Organism	Raw Count	Count / m <sup>3</sup>	% of Total	Raw Count	Count / m <sup>3</sup>	% of Total	Raw Count	Count / m <sup>3</sup>	% of Total	Raw Count	Count / m <sup>3</sup>	% of Total				
Alternaria	2	27	1.6%													
Ascospores	96	1280	77.4%	3	40	75.0%	5	67	71.4%	1	13	33.3%				
Aspergillus Penicillium	1	13	<1%				1	13	14.3%	2	27	66.7%				
Basidiospores	20	267	16.1%	1	13	25.0%	1	13	14.3%							
Bipolaris Drechslera																
Chaetomium																
Cladosporium	4	53	3.2%													
Curvularia																
Epicoccum																
Fusarium																
Memnoniella																
Myxomycetes																
Pithomyces																
Stachybotrys																
Stemphylium																
Torula																
Ulocladium																
Polythrincium	1	13	<1%													
<b>Total</b>	<b>124</b>	<b>1653</b>	<b>100%</b>	<b>4</b>	<b>53</b>	<b>100%</b>	<b>7</b>	<b>93</b>	<b>100%</b>	<b>3</b>	<b>40</b>	<b>100%</b>				

Water Damage Indicator	Common Allergen	Slightly Higher than Baseline	Significantly Higher than Baseline	Ratio Abnormality
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Collected: **May 22, 2019**      Received: **May 23, 2019**      Reported: **May 23, 2019**

Project Analyst: Ramesh Poluri, PhD *P. Ramesh*      Date: **05 - 23 - 2019**      Reviewed By: Steve Hayes, BSMT *Stephen N. Hayes*      Date: **05 - 23 - 2019**

Sample Number	5	ARRO/52019-05				
Sample Name	<b>106</b>					
Sample Volume	75.00 liter					
Reporting Limit	13 spores/m <sup>3</sup>					
Background	2					
Fragments	ND					
<b>Organism</b>	<b>Raw Count</b>	<b>Count / m<sup>3</sup></b>	<b>% of Total</b>			
Alternaria						
Ascospores	9	120	81.8%			
Aspergillus Penicillium						
Basidiospores	1	13	9.1%			
Bipolaris Drechslera	1	13	9.1%			
Chaetomium						
Cladosporium						
Curvularia						
Epicoccum						
Fusarium						
Memnoniella						
Myxomycetes						
Pithomyces						
Stachybotrys						
Stemphylium						
Torula						
Ulocladium						
Polythrincium						
<b>Total</b>	<b>11</b>	<b>146</b>	<b>100%</b>			

Water Damage Indicator	Common Allergen	Slightly Higher than Baseline	Significantly Higher than Baseline	Ratio Abnormality
------------------------	-----------------	-------------------------------	------------------------------------	-------------------



Collected: **May 22, 2019**

Received: **May 23, 2019**

Reported: **May 23, 2019**

Project Analyst:  
Ramesh Poluri, PhD *P. Ramesh*

Date:  
**05 - 23 - 2019**

Reviewed By:  
Steve Hayes, BSMT *Stephen N. Hayes*

Date:  
**05 - 23 - 2019**

**Spore Trap Information**

<b>Reporting Limit</b>	The Reporting Limit is the lowest number of spores that can be detected based on the total volume of the sample collected and the percentage of the slide that is counted. At Hayes Microbial, 100% of the slide is read so the LOD is based solely on the total volume. Raw spore counts that exceed 500 spores will be estimated.										
<b>Blanks</b>	Results have not been corrected for field or laboratory blanks.										
<b>Background</b>	<p>The Background is the amount of debris that is present in the sample. This debris consists of skin cells, dirt, dust, pollen, drywall dust and other organic and non-organic matter. As the background density increases, the likelihood of spores, especially small spores such as those of <i>Aspergillus</i> and <i>Penicillium</i> may be obscured. The background is rated on a scale of 1 to 5 and each level is determined as follows:</p> <p><b>NBD:</b> No background detected due to possible pump or cassette malfunction. Recollect sample. (Field Blanks will display NBD)</p> <p><b>1 :</b> &lt;5% of field occluded. No spores will be uncountable.</p> <p><b>2 :</b> 5-25% of field occluded.</p> <p><b>3 :</b> 25-75% of field occluded.</p> <p><b>4 :</b> 75-90% of field occluded.</p> <p><b>5 :</b> &gt;90% of field occluded. Suggested recollection of sample.</p>										
<b>Fragments</b>	Fragments are small pieces of fungal mycelium or spores. They are not identifiable as to type and when present in very large numbers, may indicate the presence of mold amplification.										
<b>Control Comparisons</b>	There are no national standards for the numbers of fungal spores that may be present in the indoor environment. As a general rule and guideline that is widely accepted in the indoor air quality field, the numbers and types of spores that are present in the indoor environment should not exceed those that are present outdoors at any given time. There will always be some mold spores present in "normal" indoor environments. The purpose of sampling and counting spores is to help determine whether an abnormal condition exists within the indoor environment and if it does, to help pinpoint the area of contamination. Spore counts should not be used as the sole determining factor of mold contamination. There are many factors that can cause anomalies in the comparison of indoor and outdoor samples due to the dynamic nature of both of those environments.										
<table border="1"> <tr> <td style="background-color: #ADD8E6;">Water Damage Indicator</td> <td><b>Blue:</b> These molds are commonly seen in conditions of prolonged water intrusion and usually indicate a problem.</td> </tr> <tr> <td style="background-color: #90EE90;">Common Allergen</td> <td><b>Green:</b> Although all molds are potential allergens, these are the most common allergens that may be found indoors.</td> </tr> <tr> <td style="background-color: #FFDAB9;">Slightly Higher than Baseline</td> <td><b>Orange:</b> The spore count is slightly higher than the outside count and may or may not indicate a source of contamination.</td> </tr> <tr> <td style="background-color: #FFB6C1;">Significantly Higher than Baseline</td> <td><b>Red:</b> The spore count is significantly higher than the baseline count and probably indicates a source of contamination.</td> </tr> <tr> <td style="background-color: #DDA0DD;">Ratio Abnormality</td> <td><b>Violet:</b> The types of spores found indoors should be similar to the ones that were identified in the baseline sample. Significant increases (more than 25%) in the ratio of a particular spore type may indicate the presence of abnormal levels of mold, even if the total number of spores of that type is lower in the indoor environment than it was outdoors.</td> </tr> </table>	Water Damage Indicator	<b>Blue:</b> These molds are commonly seen in conditions of prolonged water intrusion and usually indicate a problem.	Common Allergen	<b>Green:</b> Although all molds are potential allergens, these are the most common allergens that may be found indoors.	Slightly Higher than Baseline	<b>Orange:</b> The spore count is slightly higher than the outside count and may or may not indicate a source of contamination.	Significantly Higher than Baseline	<b>Red:</b> The spore count is significantly higher than the baseline count and probably indicates a source of contamination.	Ratio Abnormality	<b>Violet:</b> The types of spores found indoors should be similar to the ones that were identified in the baseline sample. Significant increases (more than 25%) in the ratio of a particular spore type may indicate the presence of abnormal levels of mold, even if the total number of spores of that type is lower in the indoor environment than it was outdoors.	
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<b>Color Coding</b>	Fungi that are present in indoor samples at levels lower than 200 per cubic meter are not color coded on the report, unless they are one of the water damage indicators.										



## Organism Descriptions

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<b>Alternaria</b>	<b>Habitat:</b> Commonly found outdoors in soil and decaying plants. Indoors, it is commonly found on window sills and other horizontal surfaces. <b>Effects:</b> A common allergen and has been associated with hypersensitivity pneumonitis. Alternaria is capable of producing toxic metabolites which may be associated with disease in humans or animals. Occasionally an agent of onychomycosis, ulcerated cutaneous infection and chronic sinusitis, principally in the immunocompromised patient.
<b>Ascospores</b>	<b>Habitat:</b> A large group consisting of more than 3000 species of fungi. Common plant pathogens and outdoor numbers become very high following rain. Most of the genera are indistinguishable by spore trap analysis and are combined on the report. <b>Effects:</b> Health affects are poorly studied, but many are likely to be allergenic.
<b>Aspergillus Penicillium</b>	<b>Habitat:</b> The most common fungi isolated from the environment. Very common in soil and on decaying plant material. Are able to grow well indoors on a wide variety of substrates. <b>Effects:</b> This group contains common allergens and many can cause hypersensitivity pneumonitis. They may cause extrinsic asthma, and many are opportunistic pathogens. Many species produce mycotoxins which may be associated with disease in humans and other animals. Toxin production is dependent on the species, the food source, competition with other organisms, and other environmental conditions.
<b>Basidiospores</b>	<b>Habitat:</b> A common group of Fungi that includes the mushrooms and bracket fungi. They are saprophytes and plant pathogens. In wet conditions they can cause structural damage to buildings. <b>Effects:</b> Common allergens and are also associated with hypersensitivity pneumonitis.
<b>Bipolaris Drechslera</b>	<b>Habitat:</b> They are found in soil and as plant pathogens. Can grow indoors on a variety of substrates. <b>Effects:</b> They may be allergenic and are very commonly involved in allergic fungal sinusitis. They are opportunistic pathogens but occasionally infect healthy individuals, causing keratitis, sinusitis and osteomyelitis.
<b>Cladosporium</b>	<b>Habitat:</b> One of the most common genera worldwide. Found in soil and plant debris and on the leaf surfaces of living plants. The outdoor numbers are lower in the winter and often relatively high in the summer, especially in high humidity. The outdoor numbers often spike in the late afternoon and evening. Indoors, it can be found growing on textiles, wood, sheetrock, moist window sills and in HVAC supply ducts. <b>Effects:</b> A common allergen, producing more than 10 allergenic antigens and a common cause of hypersensitivity pneumonitis.

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**Polythrincium**

**Habitat:** Found in soil and occasionally on plants.

**Effects:** No known health effects. Allergenic properties are poorly studied.

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Company: Global Inc.  
 Address: 1818 New York Ave NE  
Washington, DC

N

SHIP: FEDEX - PAK 50  
 DATE: 05-23-2019



Job Number: 19-015  
 Collector: L. Kesslak  
 Date Collected: 5-21-19

Job Name: Arrowhead ES

Mobile: 814-241-9105 Email: Lauren.KG@globalinc.usa,nc  
 Note:

Analysis Type	Analysis Description	Turnaround	Accepted Media Types	
Spore Trap	S	Identification & Enumeration of Fungal Spores	24 Hour	Air Cassettes, Impact Slides
	S+	Spore Trap Analysis with Dander, Fiber, and Pollen counts	24 Hour	Air Cassettes, Impact Slides
Direct ID	D	ID & Semi-Quantative Enumeration of spores and mycelium	24 Hour	Bio-Tape, Tape, Swab, Bulk, Agar Plate
	D+	Direct Analysis with Fully Quantitative spore count	24 Hour	Bio-Tape, Tape, Swab, Bulk, Agar Plate
Culture	C1	Identification & Enumeration of Mold only	7 Day	Air Plate, Agar Plate, Swab, Bulk
	C2	Identification & Enumeration of Bacteria only	4 Day	Air Plate, Agar Plate, Swab, Bulk
	C3	Identification & Enumeration of Mold and Bacteria	7 Day	Air Plate, Agar Plate, Swab, Bulk
	C5	Coliform Screen for Sewage Bacteria	2 Day	Agar Plate, Swab, Bulk
Particle	TPA	Total Particulate Analysis, ID & Count (Does Not Include Mold)	24 Hour	Air Cassettes, Impact Slides, Bio-Tape

#	Number	Sample	Analysis	Volume	Notes
1					
2					
3		see attached			
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Released by: [Signature] Date: 5-22-19 Received By: AN 5/23/19 Date:

20426

Arrowhead Elementary School

AD |

Sample ID	Location	Analysis	Volume
ARRO/52019-01	Ambient	S	75
ARRO/52019-02	306	S	75
ARRO/52019-03	Home Arts	S	75
ARRO/52019-04	104	S	75
ARRO/52019-05	106	S	75