

September 10, 2015

Mr. Bruce Gist  
Howard County Public School System  
10910 Route 108  
Ellicott City, MD 21043

RE: Tape Lift Sampling of Five Plastic Bins found in Classroom 13 at Glenwood Middle School  
Project #J15-876

Dear Mr. Gist,

Aria Environmental, Inc. (AE) is pleased to present this report of findings for tape lift sampling and microbial analysis of five plastic bins at Glenwood Middle School located at 2680 Route 97 in Glenwood, Maryland. Dust and staining believed to be microbial growth was discovered on one plastic bin used in Science Classroom 13. All five bins were taken to and held in the Principal's office on September 4, 2015. The bins were collected on September 4, 2015 in a clean plastic bag and taken to the AE office, tape lift samples and one swab sample were collected the same day by Julie Barth, CIH, CSP, LEED Green Associate of AE. These samples were submitted for microbial spore identification and counting and particle characterization.

#### **Tape Lift and Swab Sampling**

Some staining and dust were observed on the five bins. Bins were labeled with Post-It™ notes and photographed. One tape lift sample was collected from the bottom of each bin except for Bin 03 that had approximately 1-2 tablespoons of clear liquid in it. Tape lift samples were collected using Mold Tape Slides™ from Environmental Monitoring Systems, and the swab sample was collected using a Fisher Healthcare Microorganism Collection and Transport System swab. Samples were submitted to Aerobiology Laboratory in Dulles, Virginia for analysis. The sample results are reported as the number of spores or other structures observed per field or cover slip with a ranking from few to numerous. Table 1 presents the results of the sample analyses.

Fungal spores and hyphal elements were observed on the tape lift and swab samples for four of the five plastic bins. Hyphae are the vegetative mode of fungi, and hyphal elements are fragments of individual hyphae that have broken off. Fungal spore types included Penicillium/Aspergillus group spores, Cladosporium spores, Curvularia spores, Pithomyces spores, colorless spores and unidentified brown spores. Cellulose and synthetic fibers, non-fibrous material, skin flakes and hair were also observed on one or more of the samples.

Overall, these results indicate the presence of mold spores and other material consistent with dust on the plastic bins sampled. Certificates of analysis are included as an attachment.

**Table 1 - Results of Microbial Tape Lift and Swab Samples from Five Plastic Bins  
at Glenwood Middle School on September 4, 2015**

<b>Structure Observed</b>	<b>Sample Bin-01 Tape Lift</b>	<b>Sample Bin-02 Tape Lift</b>	<b>Sample Bin-03 Tape Lift</b>	<b>Sample Bin-03S Swab (liquid)</b>	<b>Sample Bin-04 Tape Lift</b>	<b>Sample Bin-05 Tape Lift</b>
<b>Fungal Spores</b>	Occasional Basidiospores; Occasional Penicillium/ Aspergillus group spores	Few Cladosporium spores; Moderate Penicillium/ Aspergillus group spores	Occasional brown unidentified spores	Moderate Cladosporium spores; Few Penicillium/ Aspergillus group spores	None	Occasional brown unidentified spores seen; Moderate Colorless spores; Occasional Curvularia spores; Moderate Penicillium/ Aspergillus group spores; Occasional Pithomyces spores
<b>Fungal Structures</b>	None	Few hyphal elements	Few hyphal elements	Moderate hyphal elements	None	Moderate hyphal elements
<b>Cellulose fibers</b>	None	None	None	Occasional	None	Occasional
<b>Non-fibrous material</b>	Few	Occasional	Numerous	Few	Occasional	Few
<b>Hairs</b>	None	None	None	Occasional	None	None
<b>Skin Flakes</b>	Few	Occasional	None	None	Few	None
<b>Synthetic fibers</b>	Occasional	Occasional	Occasional	Occasional	Occasional	Occasional
<b>Debris Rating</b>	2	2	3	2	1	2

Few (5 per cover slip); Occasional (1-5 per cover slip); Moderate hyphal elements (1 per 5 fields); Numerous (3-4 per field)

**Conclusions and Recommendations**

Tape lift samples and one swab sample were collected from five plastic bins on September 4, 2015 by AE. These plastic bins were being used in Science Classroom 13 when suspected mold growth was discovered. Tape lift and swab samples were submitted for microbial spore identification and counting and particle characterization. Results indicate that four of the five bins contained fungal spores or structures. One or more of the bin samples contained cellulose and synthetic fibers, skin flakes, hair and non-fibrous material. These results indicate the presence of mold spores and other material consistent with dust. These bins should be cleaned using a household-type detergent solution if they are to be reused. Otherwise, they can be disposed of or recycled.

Thank you for choosing Aria Environmental, Inc. for your industrial hygiene consulting needs. Should you have any questions about the information contained herein, please do not hesitate to contact us at 410-549-5774.

Sincerely,  
Aria Environmental, Inc.



Julie Barth, CIH, CSP, LEED Green Associate

Attachments

## ATTACHMENTS

## Five Plastic Bins from Classroom 13 at Glenwood Middle School



Plastic Bin 01 – light dust, no liquid



Plastic Bin 02 – light dust, no liquid



Plastic Bin 03 – light dust, ~2 tbs clear liquid



Plastic Bin 04 – light dust, liquid on underside, light water spots

## Five Plastic Bins from Classroom 13 at Glenwood Middle School



Plastic Bin 05 – probable mold growth  
(speckles around inside bottom), no  
liquid

Aria Environmental  
P.O. Box 286  
Woodbine, Maryland 21797  
Attn: Julie Barth  
Project: **J15-876 GMS**  
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 09/04/2015  
Date Received: 09/09/2015  
Date Analyzed: 09/09/2015  
Date Reported: 09/09/2015  
Project ID: 15021653  
Page 1 of 5

Client Sample #: Bin 01  
Sample Location: Bin 01 From Classroom 13  
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7: Same Day TAT

Lab Sample #: 15021653-001

Results:	Observation
Occasional basidiospores seen	1-5 per cover slip
Occasional Penicillium/Aspergillus group spores seen	1-5 per cover slip

Debris Rating: 2

Client Sample #: Bin 01  
Sample Location: Bin 01 From Classroom 13  
Test: 1026, Non-biological Particle Characterization: Same Day TAT

Lab Sample #: 15021653-001

Results:	Observation
Few non-fibrous material seen	5 per cover slip
Few skin flakes seen	5 per cover slip
Occasional synthetic fibers seen	1-5 per cover slip

Debris Rating: 2

Client Sample #: Bin 02  
Sample Location: Bin 02 From Classroom 13  
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7: Same Day TAT

Lab Sample #: 15021653-002

Results:	Observation
Few Cladosporium spores seen	5 per cover slip
Few hyphal elements seen	5 per cover slip
Moderate Penicillium/Aspergillus group spores seen	1 per 5 fields

Debris Rating: 2

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Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 09/04/2015  
Date Received: 09/09/2015  
Date Analyzed: 09/09/2015  
Date Reported: 09/09/2015  
Project ID: 15021653  
Page 2 of 5

Client Sample #: Bin 02  
Sample Location: Bin 02 From Classroom 13  
Test: 1026, Non-biological Particle Characterization: Same Day TAT

Lab Sample #: 15021653-002

Results:	Observation
Occasional non-fibrous material seen	1-5 per cover slip
Occasional skin flakes seen	1-5 per cover slip
Occasional synthetic fibers seen	1-5 per cover slip

Debris Rating: 2

Client Sample #: Bin 03  
Sample Location: Bin 03 From Classroom 13  
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7: Same Day TAT

Lab Sample #: 15021653-003

Results:	Observation
Occasional brown unidentified spores seen	1-5 per cover slip
Few hyphal elements seen	5 per cover slip

Debris Rating: 3

Client Sample #: Bin 03  
Sample Location: Bin 03 From Classroom 13  
Test: 1026, Non-biological Particle Characterization: Same Day TAT

Lab Sample #: 15021653-003

Results:	Observation
Numerous non-fibrous material seen	3-4 per field (minimum)
Occasional synthetic fibers seen	1-5 per cover slip

Debris Rating: 3

Client Sample #: Bin 04  
Sample Location: Bin 04 From Classroom 13  
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7: Same Day TAT

Lab Sample #: 15021653-004

Debris Rating: 2  
Comments: No fungal spores seen.



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Woodbine, Maryland 21797  
Attn: Julie Barth  
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Date Received: 09/09/2015  
Date Analyzed: 09/09/2015  
Date Reported: 09/09/2015  
Project ID: 15021653

Condition of Sample(s) Upon Receipt: Acceptable

Page 3 of 5

Client Sample #: Bin 04  
Sample Location: Bin 04 From Classroom 13  
Test: 1026, Non-biological Particle Characterization: Same Day TAT

Lab Sample #: 15021653-004

Results:	Observation
Occasional non-fibrous material seen	1-5 per cover slip
Few skin flakes seen	5 per cover slip
Occasional synthetic fibers seen	1-5 per cover slip

Debris Rating: 1

Client Sample #: Bin 05  
Sample Location: Bin 05 From Classroom 13  
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7: Same Day TAT

Lab Sample #: 15021653-005

Results:	Observation
Occasional brown unidentified spores seen	1-5 per cover slip
Moderate Colorless spores seen	1 per 5 fields
Occasional Curvularia species spores seen	1-5 per cover slip
Moderate hyphal elements seen	1 per 5 fields
Moderate Penicillium/Aspergillus group spores seen	1 per 5 fields
Occasional Pithomyces spores seen	1-5 per cover slip

Debris Rating: 2

Client Sample #: Bin 05  
Sample Location: Bin 05 From Classroom 13  
Test: 1026, Non-biological Particle Characterization: Same Day TAT

Lab Sample #: 15021653-005

Results:	Observation
Occasional cellulose fibers seen	1-5 per cover slip
Few non-fibrous material seen	5 per cover slip
Occasional synthetic fibers seen	1-5 per cover slip

Debris Rating: 2

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P.O. Box 286  
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Date Analyzed: 09/09/2015  
Date Reported: 09/09/2015  
Project ID: 15021653

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Client Sample #: Bin 03S  
Sample Location: Bin 03 from Classroom 13 (Liquid)  
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7: Same Day TAT

Lab Sample #: 15021653-006

Results:	Observation
Moderate Cladosporium spores seen	1 per 5 fields
Moderate hyphal elements seen	1 per 5 fields
Few Penicillium/Aspergillus group spores seen	5 per cover slip

Debris Rating: 2

Client Sample #: Bin 03S  
Sample Location: Bin 03 from Classroom 13 (Liquid)  
Test: 1026, Non-biological Particle Characterization: Same Day TAT

Lab Sample #: 15021653-006

Results:	Observation
Occasional cellulose fibers seen	1-5 per cover slip
Occasional hairs seen	1-5 per cover slip
Few non-fibrous material seen	5 per cover slip
Occasional Synthetic fibers seen	1-5 per cover slip

Debris Rating: 2

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Date Analyzed: 09/09/2015  
Date Reported: 09/09/2015  
Project ID: 15021653  
Page 5 of 5

## Footnotes and Additional Report Information

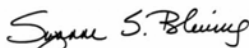
### Debris Rating Table

1	Minimal (<5%) particulate present	Reported values are minimally affected by particulate load.
2	5% to 25% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
3	26% to 75% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
4	75% to 90% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
5	Greater than 90% of the trace occluded with particulate	Quantification not possible due to large negative bias. A new sample should be collected at a shorter time interval or other measures taken to reduce particulate load.

1. Penicillium/Aspergillus group spores are characterized by their small size, round to ovoid shape, being unicellular, and usually colorless to lightly pigmented. There are numerous genera of fungi whose spore morphology is similar to that of the Penicillium/Aspergillus type. Two common examples would be Paecilomyces and Acremonium. Although the majority of spores placed in this group are Penicillium, Aspergillus, or a combination of both. Keep in mind that these are not the only two possibilities.
2. Ascospores are sexually produced fungal spores formed within an ascus. An ascus is a sac-like structure designed to discharge the ascospores into the environment, e.g. Ascobolus.
3. Basidiospores are typically blown indoors from outdoors and rarely have an indoor source. However, in certain situations a high basidiospore count indoors may be indicative of a wood decay problem or wet soil.
4. The Smut, Periconia, Myxomycete group is composed of three different groups whose spores have similar morphologies. Smuts are plant pathogens, Periconia is a relatively uncommon mold indoors, and Myxomycetes are not fungi but slime molds. Although these organisms do not typically proliferate indoors, their spores are potentially allergenic.
5. The colorless group contains colorless spores which were unidentifiable to a specific genus. Examples of this group include Acremonium, Aphanocladium, Beauveria, Chrysosporium, Engyodontium microconidia, yeast, some arthrospores, as well as many others.
6. Hyphae are the vegetative mode of fungi. Hyphal elements are fragments of individual Hyphae. They can break apart and become airborne much like spores and are potentially allergenic. A mass of hyphal elements is termed the mycelium. Hyphae in high concentration may be indicative of colonization.
7. Dash (-) in this report, under raw count column means 'not detected (ND)'; otherwise 'not applicable' (NA).
8. The positive-hole correction factor is a statistical tool which calculates a probable count from the raw count, taking into consideration that multiple particles can impact on the same hole; for this reason the sum of the calculated counts may be less than the positive hole corrected total.
9. Due to rounding totals may not equal 100%.
10. Minimum Reporting Limits (MRL) for BULKS, DUSTS, SWABS, and WATER samples are a calculation based on the sample size and the dilution plate on which the organism was counted. Results are a compilation of counts taken from multiple dilutions and multiple medias. This means that every genus of fungi or bacteria recovered can be counted on the plate on which it is best represented.
11. If the final quantitative result is corrected for contamination based on the blank, the blank correction is stated in the sample comments section of the report.
12. Analysis conducted on non-viable spore traps is completed using Indoor Environmental Standards Organization (IESO) Standard 2210.
13. The results in this report are related to this project and these samples only.
14. For samples with an air volume of < 100L, the number of significant figures in the result should be considered (2) two. For samples with air volumes between 100-999L, the number of significant figures in the result should be considered (3) three. For example, a sample with a result of 55,443 spr/m<sup>3</sup> from a 75L sample using significant figures should be considered 55,000. The same result of 55,443 from a 150L sample using significant figures should be considered 55,400 spr/m<sup>3</sup>.
15. If the In/Out ratio is greater than 100 times it is indicated >100/1, rather than showing the real value.

#### Terminology Used in Direct Exam Reporting

**Conidiophores are a type of modified hyphae from which spores are born. When seen on a surface sample in moderate to numerous concentrations they may be indicative of fungal growth.**



Suzanne S. Blevins, B.S., SM (ASCP)  
Laboratory Director



LAB #192683 (CO)  
 LAB #102977 (GA)  
 LAB #163063 (VA)  
 LAB #210229 (AZ)

NVLAP Lab Code 200860-0 (CO)  
 NVLAP Lab Code 200829-0 (VA)  
 NVLAP Lab Code 500097-0 (AZ)

AZ, CO, GA, VA, NJ

<b>Aerobiology Client</b> Aria Environmental, Inc.		<b>Collected By/Date:</b> 09/04/15		<b>Relinquished By/Date:</b>	
<b>Field Contact</b> Julie Barth	<b>Reporting Address</b> PO Box 286		<b>Relinquished By/Date:</b>		<b>Received By/Date:</b> 9/9/15
<b>Billing Address</b> Woodbine, MD 21797	<b>Phone/Fax</b> 410-549-5774/410-549-4488	<b>Sampler Type</b> Andersen _____ SAS _____	<b>Sample Aire</b> _____	<b>Other Tapelit and eq.</b>	
<b>Reporting Email (s)</b> jbarth@ariaenviro.com	<b>PO#/Job#:</b> J15-876		<b>AeroTrap</b> _____	<b>BioCulture</b> _____	
<b>Routine</b> <input type="radio"/> <b>24 Hour</b> <input type="radio"/> <b>Same Day</b> <input checked="" type="radio"/> <b>4 Hour</b> <input type="radio"/> <b>2 Hour</b> <input type="radio"/>	<b>Project Name:</b> GMS		<b>5 Day (Asbestos Only)</b> <input type="radio"/>	<b>Notes:</b>	
<b>SAMPLING LOCATION ZIP CODE</b> 21784	<b>CC Info:</b>				

Sample No.	Test Code	Sample Location	Total Volume/Area	
1	Bin 01	1051/1026	Bin 01 from Classroom 13	N/A
2	Bin 02	1051/1026	Bin 02 from Classroom 13	N/A
3	Bin 03	1051/1026	Bin 03 from Classroom 13	N/A
4	Bin 04	1051/1026	Bin 04 from Classroom 13	N/A
5	Bin 05	1051/1026	Bin 05 from Classroom 13	N/A
6	Bin 03S	1051/1026	Bin 03 from Classroom 13 (liquid)	N/A
7				
8				
9				
10				
11				
12				
13				
14				

1054	Direct, Non-viable Spore Trap	1015	Culture - WATER Legionella
1051	Direct, Qualitative- Swab/Tape	1017	Culture - SWAB Legionella
1050	Direct, Qualitative- Bulk	1010	WATER - Potable - E. coli/total coliforms
1005	AIR Culture - Bacterial Count w/ ID's	1012	SWAB - E. coli/total coliforms
1030	AIR Culture - Fungal Count w/ ID's	1028	Sewage Screen (E. coli/Enterococcus/fecal coliforms)
1006	SWAB Culture - Bacterial Count w/ ID's	2056	Heterotrophic Plate Count
1031	SWAB Culture - Fungal Count w/ ID's	3001	ASBESTOS - Point count
1008	BULK Culture - Bacterial Count w/ ID's	3002	ASBESTOS - PLM Analysis
1033	BULK Culture - Fungal Count w/ ID's	3003	ASBESTOS - Particle characterization
1007	WATER Culture - Bacterial Count w/ID's	3004	ASBESTOS - PCM Analysis