Aria Environmental, Inc.
INDUSTRIAL HYGIENE & SAFETY CONSULTANTS

October 21, 2015

Mr. Jeff Klenk
Howard County Public School System
10910 Route 108
Ellicott City, MD 21043

RE: Tape Lift and Swab Sampling of Items found at Glenwood Middle School
Project #J15-876

Dear Mr. Klenk,

Aria Environmental, Inc. (AE) is pleased to present this report of findings for tape lift and swab sampling and microbial analysis of items at Glenwood Middle School located at 2680 Route 97 in Glenwood, Maryland. Dust, discoloration and/or staining believed to be microbial growth was discovered on a glue stick, two books, one small plastic storage bin and several cloth-backed chairs. The chairs were held in the portable classroom 80 that is now a storage room. The other items were taken to and held in the Principal's office. A swab sample was collected from the glue stick, and tape lift samples were collected from the other items by Julie Barth, CIH, CSP, LEED Green Associate of AE on October 7, 2015. These samples were submitted for microbial spore identification and counting.

Tape Lift and Swab Sampling

Dark blue or black discoloration was observed on the glue stick and one swab (Swab 01) was collected from a discolored section. Two tape lift samples (Tape 01 and Tape 02) were collected from two books that had wrinkling consistent with water damage and spots consistent with mold growth. One tape lift sample (Tape-03) was collected from the bottom of a bin that had what appeared to be a white chalky type residue in it, and two tape lift samples (Tape-04 and Tape-05) were collected from the cloth backs of two out of six chairs that had a delineated dust loading on the tops of the chairs only. Photographs of the items are included as an attachment.

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 were observed on the swab sample of the glue stick and on four of the five tape lift samples of the books, and chairs. Hyphal elements were found on the glue stick swab and the two tape lift samples on the books. Hyphae are the vegetative mode of fungi, and hyphal elements are fragments of individual hyphae that have broken off. Fungal spore types included Alternaria spores, Penicillium/Aspergillus group spores, Cladosporium spores, Smuts, Periconia and Myxomycetes group spores, yeast and 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 on the glue stick, the books and the chair fabric. Certificates of analysis are included as an attachment.

PO Box 286 • Woodbine, MD 21797 • Office: 410-549-5774 • Fax: 410-549-4488

Table 1 - Results of Microbial Tape Lift and Swab Samples of Various Items at Glenwood Middle School on October 7, 2015

Structure Observed	Swab-01 Glue Stick	Tape-01 Book 1	Tape-02 Book 2	Tape-03 Bin	Tape-04 Chair 1	Tape-05 Chair 2
Fungal Spores	Occasional brown unidentified spores; Few Cladosporium spores	Few clear brown spores; Moderate colorless spores; Few Penicillium/ Aspergillus group spores; Few Yeast	Numerous colorless spores; Few Penicillium/ Aspergillus group spores; Few Yeast	None	Occasional Cladosporium spores	Occasional Alternaria spores; Occasional Cladosporium spores; Occasional Smuts, Periconia, Myxomycetes
Fungal Structures	Occasional hyphal elements	Few hyphal elements	Moderate hyphal elements	None	None	None
Debris Rating	2	3	3	3	2	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 a glue stick, two books, one small plastic bin, and two chairs on October 7, 2015 by AE. These items had suspected mold growth due to discoloration. Tape lift and swab samples were submitted for microbial spore identification and counting. Results indicate that five of the six samples contained fungal spores or structures. These results indicate the presence of mold spores but do not necessarily indicate mold growth. We would expect to see numerous spore and hyphal element counts, if mold were actively growing on a surface. The glue stick has what appears to be a manufacturing defect of color and should be discarded. The presence of some spores would be suspected during manufacturing and normal use, and the spores observed on the swab do not necessarily indicate mold growth. The books were stored near a window and appear to have water damage and speckling consistent with mold growth. These books should be discarded and replaced if possible. The plastic bin should be cleaned using a household-type detergent solution, if it is to be reused. Otherwise, it can be disposed of or recycled. The cloth upholstery on the chairs can be cleaned using a vacuum and an upholstery cleaning product if they are to be reused.

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

Aerobiology Laboratory Associates, Incorporated
Expertise Since 1997

43760 Trade Center Place
Suite 100
Sterling, Virginia 20166
(877) 648-9150
www.aerobiology.net

Certificate of Analysis
EMLAP# 102977

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

Date Collected: 10/07/2015
Date Received: 10/09/2015
Date Analyzed: 10/15/2015
Date Reported: 10/15/2015
Project ID: 15026394

Client Sample #: Swab-01
Lab Sample #: 15026394-013
Sample Location: Glue Stick (Discolored)
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7

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

Debris Rating: 2

Client Sample #: Tape-01
Lab Sample #: 15026394-014
Sample Location: Book-01
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7

Results:	Observation
Few Clear brown spores seen	5 per cover slip
Moderate Colorless spores seen	1 per 5 fields
Few hyphal elements seen	5 per cover slip
Few Penicillium/Aspergillus group spores seen	5 per cover slip
Few Yeast seen	5 per cover slip

Debris Rating: 3

Client Sample #: Tape-02
Lab Sample #: 15026394-015
Sample Location: Book-2
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7

Results:	Observation
Numerous Colorless spores seen	3-4 per field (minimum)
Moderate hyphal elements seen	1 per 5 fields
Few Penicillium/Aspergillus group spores seen	5 per cover slip
Few Yeast seen	5 per cover slip

Debris Rating: 3

Client Sample #: Tape-03
Lab Sample #: 15026394-016
Sample Location: Bin With White Residue
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7

Debris Rating: 3
Comments: No fungal spores seen.

Aerobiology Laboratory Associates, Incorporated
Expertise Since 1997

43760 Trade Center Place
Suite 100
Sterling, Virginia 20166
(877) 648-9150
www.aerobiology.net

Certificate of Analysis
EMLAP# 102977

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

Date Collected: 10/07/2015
Date Received: 10/09/2015
Date Analyzed: 10/15/2015
Date Reported: 10/15/2015
Project ID: 15026394

Client Sample #: Tape-04
Lab Sample #: 15026394-017
Sample Location: Chair-1
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7

Results:	Observation
Occasional Cladosporium spores seen	1-5 per cover slip

Debris Rating: 2

Client Sample #: Tape-05
Lab Sample #: 15026394-018
Sample Location: Chair-2
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7

Results:	Observation
Occasional Alternaria spores seen	1-5 per cover slip
Occasional Cladosporium spores seen	1-5 per cover slip
Occasional Smuts,Periconia,Myxomycetes spores seen	1-5 per cover slip

Debris Rating: 2

Aerobiology Laboratory Associates, Incorporated
Expertise Since 1997

43760 Trade Center Place
Suite 100
Sterling, Virginia 20166
(877) 648-9150
www.aerobiology.net

Certificate of Analysis
EMLAP# 102977

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

Date Collected: 10/07/2015
Date Received: 10/09/2015
Date Analyzed: 10/15/2015
Date Reported: 10/15/2015
Project ID: 15026394

Footnotes and Additional Report Information

Debris Rating Table

1	Minimal (<5%) particular 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 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.

5. 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.

6. Dash (-) in this report, under raw count column means 'not detected (ND)'; otherwise 'not applicable' (NA).

7. 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.

8. Due to rounding totals may not equal 100%.

9. Analytical Sensitivity for each spores is different for Non-viable sample when the spores are read at different percentage.

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 considered (3) three. For example, a sample with a result of 55,443 spr/m^3 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^3.

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

Aerobiology Laboratory Associates, Incorporated
Expertise Since 1997

Lab Use: 1502639

ELITE Program — AZ, CO, GA, VA, NJ

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

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

Aerobiology Client	Aria Environmental, Inc.		
Field Contact	Julie Barth	Collected By/Date: 10/07/15	Relinquished By/Date: 10/08/15
Reporting Address	PO Box 286, Woodbine, MD 21797	Relinquished By/Date: 10/08/15	Received By/Date: CM 10/9/2015
Billing Address	SAME	Sampler Type: Andersen____ SAS____	SampleAire____ AeroTrap____ Other Tapelifts and Sl BioCulture____
Phone/Fax	410-549-5774/410-549-4488	PO#/Job#: J15-876 GMS	
Reporting Email (s)	jbarth@ariaenviro.com	Project Name: Glenwood MS	
Routine ◉ 24 Hour ○ Same Day ○ 4 Hou ○ 2 Hou ○		5 Day (Asbestos Only)	Notes:
SAMPLING LOCATION ZIP CODE	21738	CC Info:	

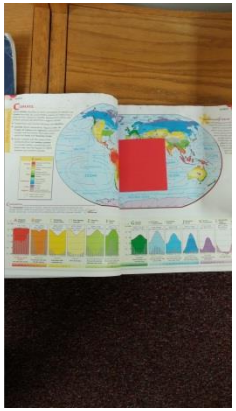
	Sample No.	Test Code	Sample Location	Total Volume/Area
1	Swab-01	1051	Glue Stick (discolored)	N/A
2	Tape-01	1051	Book-1	N/A
3	Tape-02	1051	Book-2	N/A
4	Tape-03	1051	Bin with white residue	N/A
5	Tape-04	1051	Chair-1	N/A
6	Tape-05	1051	Chair-2	N/A
7				
8				
9				
10				
11				
12				
13				
14				

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

7184 North Park Drive, Pennsauken, NJ 08109 - **(856) 486-1177** Fax (856) 486-0005 - email: info@purearthlab.com
2400 Herodian Way, Suite 190, Smyrna, GA 30080 - **(866) 620-9313** Fax (770) 947-2938 - email: ATL@aerobiology.net
780 Simms Street, Suite 104, Golden, CO 80401 - **(866) 620-9348** Fax (303) 232-0283 - email: denver@aerobiology.net
43760 Trade Center Place, Suite 100, Dulles, VA 20166 - **(877) 648-9150** Fax (877) 598-0946 - email: info@aerobiology.net
15061 Springdale Street, Suite 111, Huntington Beach, CA 92649 - **(714) 895-8401** - (866) 895-8132 - email: socal@aerobiology.net
2228 West Northern Avenue, Suite B110, Phoenix, AZ 85021 - **(855) 738-5619** Fax (602) 441-2818 - email: phoenix@aerobiology.net

Items With Suspect Mold Sampled at Glenwood Middle School on October 7, 2015

Discolored glue stick



Book with water damage

Plastic bin with white residue

Chair with line of dust on top