

**SPORE SAMPLING REPORT
FOR
GLENWOOD MIDDLE SCHOOL
2680 ROUTE 97
GLENWOOD, MD 21738**

PREPARED FOR:

**HOWARD COUNTY PUBLIC SCHOOL SYSTEM
10910 ROUTE 108
ELLICOTT CITY, MD 21043**

PREPARED BY:



**ARIA ENVIRONMENTAL, INC.
PO BOX 286
WOODBINE, MD 21797**

SEPTEMBER 16, 2015

150876

**SPORE TRAP SAMPLING REPORT
FOR GLENWOOD MIDDLE SCHOOL
SEPTEMBER 2, 2015**

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**SPORE TRAP SAMPLING REPORT
FOR GLENWOOD MIDDLE SCHOOL
SEPTEMBER 2, 2015**

EXECUTIVE SUMMARY

Aria Environmental, Inc. (AE) was contracted by Howard County Public School System to perform spore trap sampling at the Glenwood Middle School at the end of August 2015 due to air quality concerns expressed by staff and parents and to monitor the school after a recent heating, ventilation and air-conditioning (HVAC) system upgrade. AE made measurements for temperature, humidity, carbon monoxide, carbon dioxide and particulate matter and collected microbial spore trap sampling for fungal spore identification and counting on September 2, 2015 as part of a series of spore sampling events that will occur in the first month of the 2015 - 2016 school year and less frequently throughout the school year. This report presents the results of air sampling made on September 2, 2015.

**Spore Trap Sampling Report
For Glenwood Middle School
September 2, 2015**

I. BACKGROUND

Representatives from Aria Environmental, Inc. (AE) visited Glenwood Middle School on September 2, 2015 to perform air monitoring in response to an ongoing indoor air quality complaint at the school. Measurements for temperature, humidity, carbon monoxide, carbon dioxide and particulate matter and microbial spore trap sampling were collected from classrooms 4, 5, 16, 17, 23, 32, Tech Ed lab 39 and Tech Ed classroom 40, and portable classrooms 60, 61, 70, 71, 80 and 81. Outdoor air samples were also collected for comparison purposes in one courtyard and outside near portable classroom 71. This monitoring was performed in response to employee and parental complaints and as a follow up to HVAC improvements.

There was no visible evidence of mold growth nor observed odors consistent with mildew in the classrooms sampled. Weather on the day of monitoring was warm and sunny.

II. OBSERVATIONS AND MEASUREMENTS

A. Observations and Measurements on September 2, 2015

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by the American Society for Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) standard 55-2013. These ranges are presented in Table 1. The room air temperature measured between 3:00 PM and 5:00 PM ranged from 74.8 to 83.1° F with an average of 76.9° F. The indoor relative humidity ranged from 41.8 to 62.1 percent. The temperature and relative humidity measurements are considered acceptable for summer thermal comfort in all rooms except Room 80 where the temperature and humidity were 83.1° F and 62.1%. Room 80 is a portable classroom that is being used as storage. The air-conditioning and ventilation system in this room did not appear to be operating. Results of temperature, relative humidity, carbon dioxide and carbon monoxide monitoring are presented in Table 2.

Table 1- Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter^a

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F - 75.5°F	73.5°F – 79.5°F
50%	68.5°F - 74.5°F	73.0°F – 79.0°F
60%	68.0°F - 74.0°F	72.5°F – 78.0°F

^aadapted from ASHRAE Standard 55-2013

The outside temperature at 4:38 PM was 83.3° F and the outdoor relative humidity was 69.4% outside near Portable Classroom 71, and the outside temperature at 4:44 PM was 88.1° F and the relative humidity was 54.8% in the courtyard between classrooms 14 and 26. No windows or doors were observed to be open during the monitoring period. The U.S. Environmental Protection Agency (EPA) recommends maintaining indoor relative humidity below 60% and ideally between 30 and 50%. The indoor humidity measurements were within the ranges recommended for thermal comfort except for the one measurement in portable storage room 80. The school was on a summer cooling schedule at the time of monitoring.

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon

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dioxide; therefore, the build-up of carbon dioxide indicates inadequate ventilation. Air monitoring was performed after school hours when the rooms were mostly unoccupied. Carbon dioxide concentrations ranged from 356 to 895 ppm indoors. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2013 as 700 ppm above outdoor air. On the day of monitoring, the outdoor air concentration of carbon dioxide ranged from 312 to 334 ppm. Carbon dioxide concentrations were within the comfort parameters established by ASHRAE.

Carbon monoxide is mainly attributed to incomplete combustion. Concentrations of CO ranged from 0.2 to 0.6 ppm indoors and the outdoor concentration ranged from 0.0 to 0.1 ppm in the two outdoor locations measured. CO concentrations were below the ASHRAE concentration of concern of 9 ppm.

Particulate matter or PM is the term for a mixture of solid particles and liquid droplets found in the air. It does not distinguish between the types of particles in the air (e.g., pollen, skin cells, mold spores, soil, etc.). Particulate matter includes "inhalable coarse particles," with diameters larger than 2.5 micrometers and smaller than 10 micrometers (PM 10) and "fine particles," with diameters that are 2.5 micrometers and smaller (PM 2.5). Particle loads expected to be a part of the school environment include carpet and clothing fiber, soil tracked from outside, paper dust, chalk dust, and dust and fibers from building materials. ASHRAE Standard 62.1–2013 suggests target indoor concentrations for PM 2.5 and PM 10 of 15 $\mu\text{g}/\text{m}^3$ and 50 $\mu\text{g}/\text{m}^3$, respectively. These concentrations are taken from the EPA's National Ambient Air Quality Standards (NAAQS) based on annual arithmetic means deemed acceptable for outdoor air quality. Occupational standards and guidelines for particles are nearly an order of magnitude higher than concentrations typically found in non-occupational settings and are not appropriate for comparison.

Particle measurements were taken with an Aerocet 531 particulate monitor. The particle monitor takes a two minute averaged sample of particle concentrations in 5 size fractions (PM 1, PM 2.5, PM 7, PM 10 and total suspended particles (TSP)). Results of particulate monitoring, presented in Table 2, revealed that PM 2.5 and PM 10 particle concentrations were well below the ASHRAE target concentrations in all areas monitored.

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**Table 2: Particle, Temperature, Relative Humidity, Carbon Dioxide and Carbon Monoxide
Measurements Collected on September 2, 2015 at Glenwood Middle School**

Location	Time	PM1 ($\mu\text{g}/\text{m}^3$)	PM2.5 ($\mu\text{g}/\text{m}^3$)	PM7 ($\mu\text{g}/\text{m}^3$)	PM10 ($\mu\text{g}/\text{m}^3$)	TSP ($\mu\text{g}/\text{m}^3$)	Temp ($^{\circ}\text{F}$)	Rh (%)	CO (ppm)	CO ₂ (ppm)
CR 4	3:21 PM	1	2	3	4	6	74.9	53	0.4	520
CR 5	3:23 PM	1	2	3	4	4	74.8	52.8	0.3	427
CR 16	3:34 PM	1	2	4	5	7	74.9	50.4	0.4	454
CR 17	3:32 PM	1	2	3	3	7	74.8	50.8	0.3	444
CR 23	3:37 PM	1	2	3	3	5	74.9	48.3	0.3	459
CR 32	3:46 PM	1	2	2	2	4	75.2	48.1	0.2	402
CR 39	4:18 PM	1	2	3	3	3	77.9	48.4	0.6	356
CR 40	4:23 PM	1	2	3	3	3	76.4	51.1	0.2	410
PCR 80	4:13 PM	2	3	4	4	4	83.1	62.1	0.4	860
PCR 81	4:11 PM	0	1	2	2	2	78.1	47.4	0.6	774
PCR 60	4:07 PM	0	1	1	1	1	77.3	55.8	0.2	367
PCR 61	4:04 PM	4	5	5	5	6	77.9	49.9	0.4	645
PCR 70	3:59 PM	0	1	1	1	1	77.5	41.9	0.2	555
PCR 71	3:56 PM	0	1	4	4	6	78.8	41.8	0.5	895
Outside 1 near PCR 71	4:44 PM	1	3	13	13	18	88.1	54.8	0.2	312
Outside in Courtyard between Classrooms 14 and 26	4:38 PM	2	3	6	6	8	83.3	69.4	0	334

CR = Classroom; PCR = Portable Classroom; Bold type indicates measurements above the guidelines

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B. Air Monitoring for Fungal Identification and Counting on September 2, 2015

In the absence of visual sources of mold amplification and growth in the classrooms, non-viable spore trap samples were collected from eight classrooms within the main school building (Classrooms 4, 5, 16, 17, 23, 32, Tech Ed 39 and Tech Ed 40), six portable classrooms (portable classrooms 60, 61, 70, 71, 80, and 81) and two outdoor locations to determine whether there was a difference between mold spore loads inside the building versus outside.

The spore trap samples were collected using AllergenCo-D cassettes attached to a Buck BioAire™ sampling pump calibrated to 15 liter per minute (LPM) air flow. The samples were collected for a period of ten minutes, the time period recommended for spore trap sampling in a clean indoor environment. The spore trap samples were submitted to Aerobiology Laboratory for analysis. The sample results are reported as the spores per cubic meter of air (spores per m³) of hyphal fragments and total fungal spores. Depending upon the morphology of the spores, they were counted by their unique genus or were grouped into spores exhibiting common characteristics (e.g., *Penicillium*/*Aspergillus* group). Table 3 presents the results of the spore trap samples collected at Glenwood Middle School on September 2, 2015.

Indoor spore counts ranged from 2,240 to 6,526 total spores per cubic meter of air (m³) in the main school building and from 1,860 to 7,960 in the portable classrooms on September 2, 2015. All indoor samples had total spore counts lower than the outdoor samples which ranged from 33,294 to 37,306 spores per m³. *Gliomastix* and *Peronospora* spores were found in the Classroom 4 and 61 samples respectively at 7 spores per m³ each, but these spores were not found in the outdoor samples. *Helicosporium*/*Helicomycetes* spores were higher in the Classroom 60 sample (300 spores per m³) compared to the outdoor samples (7 spores per m³). The rusts spore count found in Classrooms 4, 5, and 17 samples (13 – 40 spores per m³) were slightly higher than the outdoor sample that had 7 spores per m³. Windows were not open during sampling.

No secondary colonizers including *Chaetomium* or *Stachybotrys* were detected in the indoor air samples. *Chaetomium* was detected in one outdoor sample at 13 spores per m³. Hyphal elements were detected in five of the eight main building classrooms and in four of the six portable classrooms. Indoor samples ranged from 7 to 20 hyphal elements per m³; however, all detected indoor hyphal elements were lower than the outdoor sample hyphal element counts ranging from 120 to 147 elements per m³ in the two outdoor samples. Variations in outdoor spore concentrations are a function of diurnal rhythms of spore release, weather-related factors (e.g., wind, rain, snow cover, temperature), and physical spatial factors. Certificates of analysis are included as Attachment B.

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Table 3: Results of Spore Trap Sampling in Selected Classrooms in Glenwood Middle School on September 2, 2015

Location	Outside near Classroom 71 (Out 1)	Outside in Courtyard (Out 2)	Room 4 (GM 04)	Room 5 (GM 05)	Room 16 (GM 16)	Room 17 (GM 17)	Room 23 (GM 23)	Room 32 (GM 32)	Tech Ed Room 39 (GM 39)	Tech Ed Room 40 (GM 40)
Spore Type	Spores/ m ³	Spores/ m ³	Spores/ m ³	Spores/ m ³	Spores/ m ³	Spores/ m ³	Spores/ m ³	Spores/ m ³	Spores/ m ³	Spores/ m ³
Alternaria	47	87	-	-	-	-	-	-	-	-
Ascospores	667	1,280	27	13	20	20	20	7	20	40
Basidiospores	21,368	17,094	4,693	1,600	3,840	5,333	1,493	3,413	5,966	2,880
Cercospora	253	313	7	-	-	7	-	-	-	-
Chaetomium	-	13	-	-	-	-	-	-	-	-
Cladosporium	13,632	12,780	480	373	373	427	640	613	480	800
Curvularia	40	47	-	-	-	-	-	-	-	-
Epicoccum	80	107	-	-	-	7	-	7	-	-
Fusicladium	33	40	-	-	-	-	-	-	-	-
Gliomastix	-	-	7	-	-	-	-	-	-	-
Helicosporium/ Helicomycetes	-	7	-	-	-	-	-	-	-	-
Hyphal Elements	120	147	-	7	-	7	13	7	-	7
Oidium	13	7	-	-	-	-	-	-	-	-
Penicillium/ Aspergillus	867	993	240	207	120	287	213	213	53	-
Peronospora	-	-	-	-	-	-	-	-	-	-
Pithomyces	60	187	-	-	-	-	13	-	7	-
Polythrincium	7	13	-	-	-	-	-	-	-	-
Pyricularia	-	13	-	-	-	-	-	-	-	-
Rusts	7	-	13	40	-	13	7	-	-	-
Smuts, Periconia, myxomycetes	107	127	-	-	-	7	-	-	-	-
Tetraploa	-	7	-	-	-	-	-	-	-	-
Torula	-	33	-	-	-	-	-	-	-	-
Unknown	7	-	-	-	-	-	-	-	-	-
Total Fungi	37,306	33,294	5,467	2,240	4,353	6,107	2,400	4,260	6,526	3,840

Bold numbers represent spore concentrations above the outdoor counts. Dashes designate none detected.

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Table 4: Results of Spore Trap Sampling in Portable Classrooms in Glenwood Middle School on September 2, 2015

Location	Outside near Classroom 71 (Out 1)	Outside in Courtyard (Out 2)	Room 60 (GM 60)	Room 61 (GM 61)	Room 70 (GM 70)	Room 71 (GM 71)	Room 80 (GM 80)	Room 81 (GM 81)
Spore Type	Spores/m ³	Spores/m ³	Spores/m ³	Spores/m ³	Spores/m ³	Spores/m ³	Spores/m ³	Spores/m ³
Alternaria	47	87	7	-	-	7	-	-
Ascospores	667	1,280	53	-	13	60	213	20
Basidiospores	21,368	17,094	1,227	3,413	1,867	853	6,507	2,293
Cercospora	253	313	7	20	13	13	40	13
Chaetomium	-	13	-	-	-	-	-	-
Cladosporium	13,632	12,780	720	933	1,707	613	987	533
Curvularia	40	47	-	13	-	7	-	7
Epicoccum	80	107	7	7	7	-	-	-
Fusicladium	33	40	33	-	-	-	-	-
Glomastix	-	-	-	-	-	-	-	-
Helicosporium/ Helicomycetes	-	7	300	-	-	-	-	-
Hyphal Elements	120	147	-	7	7	20	13	-
Oidium	13	7	7	-	-	-	-	-
Penicillium/ Aspergillus	867	993	-	287	353	227	193	60
Peronospora	-	-	-	7	-	-	-	-
Pithomyces	60	187	-	-	7	53	-	7
Polythrincium	7	13	-	-	-	-	-	-
Pyricularia	-	13	7	-	-	-	-	-
Rusts	7	-	-	-	-	7	-	-
Smuts, Periconia, myxomycetes	107	127	-	33	27	-	7	-
Tetraploa	-	7	-	-	-	-	-	-
Torula	-	33	-	-	-	-	-	-
Unknown	7	-	-	-	-	-	-	-
Total Fungi	37,306	33,294	2,367	4,720	4,000	1,860	7,960	2,933

Bold numbers represent spore concentrations above the outdoor counts. Dashes designate none detected.

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For Glenwood Middle School
September 2, 2015**

III. CONCLUSIONS AND RECOMMENDATIONS

Aria Environmental, Inc. (AE) was contracted by Howard County Public School System to perform spore trap sampling at the Glenwood Middle School at the end of August 2015 due to air quality concerns expressed by staff and parents and to monitor the school after a recent heating, ventilation and air-conditioning (HVAC) system upgrade. AE made measurements for temperature, humidity, carbon monoxide, carbon dioxide and particulate matter and collected microbial spore trap samples on September 2, 2015.

Thermal comfort parameters of temperature and humidity were measured and found to be within the comfort ranges established by ASHRAE except for one portable classroom that is being used as storage and does not have conditioned air. Carbon dioxide, carbon monoxide and particulate matter measurements were within acceptable ranges for good indoor air quality in all areas.

Indoor spore counts ranged from 2,240 to 6,526 total spores per cubic meter of air (m³) in the main school building classrooms and from 1,860 to 7,960 in the portable classrooms on September 2, 2015. All indoor samples had total spore counts lower than the outdoor samples which ranged from 33,294 to 37,306 spores per m³.

Gliomastix and Peronospora spores were found in the Classroom 4 and 61 samples respectively at 7 spores per m³ each, but these spores were not found in the outdoor samples. Helicosporium/Helicomyces spores were higher in the Classroom 60 sample (300 spores per m³) compared to the outdoor samples (7 spores per m³). The rusts spore count found in Classrooms 4, 5, and 17 samples (13 – 40 spores per m³) were slightly higher than the outdoor sample that had 7 spores per m³. According to a recent literature review, these spore types have little human health implication.

Table 5 presents a summary of spore sampling results to date in the 2015 - 2016 school year. The indoor and outdoor ranges demonstrate the variable nature of spore counts.

Table 5 – Summary of Spore Sampling Results to Date at GMS in the 2015-2016 School Year

Date	Indoor Spore Count Range Spores per m³	Outdoor Spore Count Range Spores per m³
August 25, 2015	1,787 to 8,807	34,001 to 37,316
August 27, 2015	400 to 747	9,433 to 10,960
September 2, 2015	1,860 to 7,960	33,294 to 37,306

Spore measurements collected in classrooms were generally acceptable compared to outdoor samples with outdoor total spore counts approximately 8 times higher than the indoor counts on average. Indoor sample total spore counts and individual spore counts were all lower than the outdoor sample counts with a few exceptions described above. Follow up air sampling is scheduled for September 9, 2015 and will be performed on a weekly basis until the end of September in order to monitor changes in conditions affected by seasonal variations and the new HVAC system.

IV. LIMITATIONS

This report has been prepared for the exclusive use of the Howard County Public School System and/or their agents. This service has been performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made. Our conclusions and

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September 2, 2015**

recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards. Destructive sampling was not performed as part of this survey. No observations were made behind solid walls, ceilings or in pipe chases that weren't already openly visible.

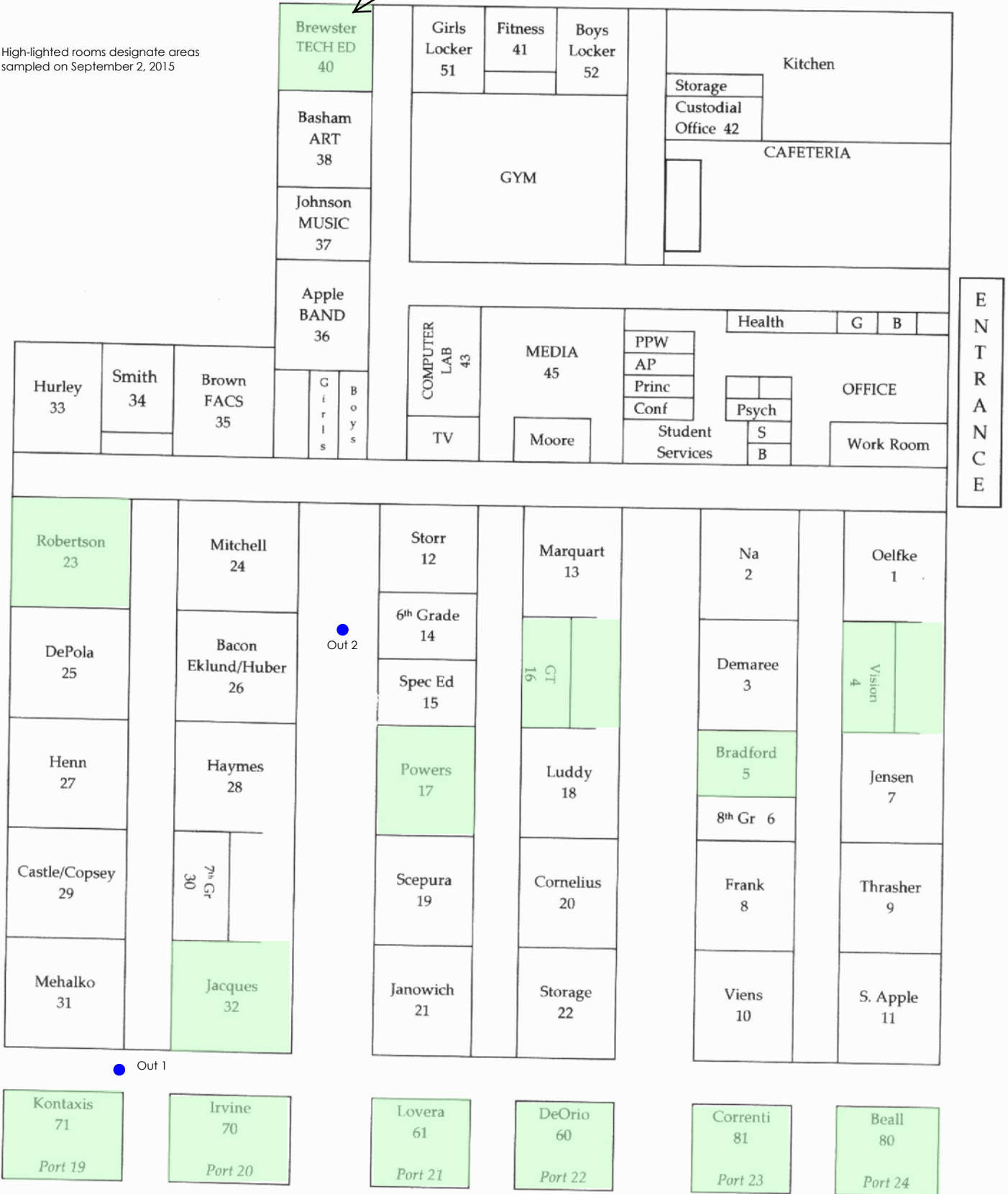
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that may present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions (e.g. abatement, removal, etc.) initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

Attachment A:

Building Layout and Sample Location Plan for September 2, 2015

Rooms 39 & 40

High-lighted rooms designate areas sampled on September 2, 2015



Glenwood Middle School Floor Plan

As of 8/02/13



Attachment B:

**Report of Analysis and Chain of Custody Forms
September 2, 2015**

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

Date Collected: 09/02/2015
Date Received: 09/04/2015
Date Analyzed: 09/10/2015
Date Reported: 09/10/2015
Project ID: 15021402
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1054 Spore Trap Analysis: SOP 3.8

Client Sample Number	GM 04				GM Out 1			
Sample Location	CR04				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-001				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	4	27	<1	1/25	25	667	2	-
basidiospores	44	4693	86	1/5	50	21368	57	-
Cercospora	1	7	<1	1/38	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	18	480	9	1/28	64	13632	37	-
Curvularia	-	-	-	-	6	40	<1	-
Epicoccum	-	-	-	-	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	1	7	<1	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	-	-	-	-	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	36	240	4	1/4	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	2	13	<1	2/1	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	106	5467	~100%	1/7	385	37306	~100%	-

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

Date Collected: 09/02/2015
Date Received: 09/04/2015
Date Analyzed: 09/10/2015
Date Reported: 09/10/2015
Project ID: 15021402

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Client Sample Number	GM 05				GM Out 1			
Sample Location	CR05				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-002				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	2	13	1	1/50	25	667	2	-
basidiospores	30	1600	71	1/13	50	21368	57	-
Cercospora	-	-	-	-	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	14	373	17	1/37	64	13632	37	-
Curvularia	-	-	-	-	6	40	<1	-
Epicoccum	-	-	-	-	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	1	7	<1	1/18	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	31	207	9	1/4	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	6	40	2	6/1	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	84	2240	~100%	1/17	385	37306	~100%	-

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

 Date Collected: 09/02/2015
 Date Received: 09/04/2015
 Date Analyzed: 09/10/2015
 Date Reported: 09/10/2015
 Project ID: 15021402
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Client Sample Number	GM 16				GM Out 1			
Sample Location	CR16				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-003				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	3	20	<1	1/33	25	667	2	-
basidiospores	36	3840	88	1/6	50	21368	57	-
Cercospora	-	-	-	-	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	14	373	9	1/37	64	13632	37	-
Curvularia	-	-	-	-	6	40	<1	-
Epicoccum	-	-	-	-	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	-	-	-	-	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	18	120	3	1/7	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	71	4353	~100%	1/9	385	37306	~100%	-

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Client Sample Number	GM 17				GM Out 1			
Sample Location	CR17				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-004				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	3	20	<1	1/33	25	667	2	-
basidiospores	50	5333	87	1/4	50	21368	57	-
Cercospora	1	7	<1	1/38	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	16	427	7	1/32	64	13632	37	-
Curvularia	-	-	-	-	6	40	<1	-
Epicoccum	1	7	<1	1/12	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	1	7	<1	1/18	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	43	287	5	1/3	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	2	13	<1	2/1	1	7	<1	-
Smuts,Periconia,Myxomycetes	1	7	<1	1/16	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	118	6107	~100%	1/6	385	37306	~100%	-

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Client Sample Number	GM 23				GM Out 1			
Sample Location	CR23				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-005				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	3	20	1	1/33	25	667	2	-
basidiospores	28	1493	62	1/14	50	21368	57	-
Cercospora	-	-	-	-	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	24	640	27	1/21	64	13632	37	-
Curvularia	-	-	-	-	6	40	<1	-
Epicoccum	-	-	-	-	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	2	13	1	1/9	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	32	213	9	1/4	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	2	13	1	1/5	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	1	7	<1	1/1	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	92	2400	~100%	1/16	385	37306	~100%	-

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Client Sample Number	GM 32				GM Out 1			
Sample Location	CR32				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-006				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	1	7	<1	1/100	25	667	2	-
basidiospores	32	3413	80	1/6	50	21368	57	-
Cercospora	-	-	-	-	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	23	613	14	1/22	64	13632	37	-
Curvularia	-	-	-	-	6	40	<1	-
Epicoccum	1	7	<1	1/12	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	1	7	<1	1/18	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	32	213	5	1/4	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 2				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	90	4260	~100%	1/9	385	37306	~100%	-

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Client Sample Number	GM 39				GM Out 1			
Sample Location	CR39 Tech Ed Lab				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-007				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	3	20	<1	1/33	25	667	2	-
basidiospores	56	5966	91	1/4	50	21368	57	-
Cercospora	-	-	-	-	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	18	480	7	1/28	64	13632	37	-
Curvularia	-	-	-	-	6	40	<1	-
Epicoccum	-	-	-	-	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	-	-	-	-	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	8	53	1	1/16	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	1	7	<1	1/9	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 2				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	86	6526	~100%	1/6	385	37306	~100%	-

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Client Sample Number	GM 40				GM Out 1			
Sample Location	CR40 Tech Ed Center				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-008				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	6	40	1	1/17	25	667	2	-
basidiospores	54	2880	75	1/7	50	21368	57	-
Cercospora	-	-	-	-	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	30	800	21	1/17	64	13632	37	-
Curvularia	-	-	-	-	6	40	<1	-
Epicoccum	-	-	-	-	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	1	7	<1	1/18	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	17	113	3	1/8	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 2				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	108	3840	~100%	1/10	385	37306	~100%	-

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Client Sample Number	GM 60				GM Out 1			
Sample Location	CR60 Portable 22				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-009				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	1	7	<1	1/7	7	47	<1	-
ascospores	8	53	2	1/13	25	667	2	-
basidiospores	46	1227	52	1/17	50	21368	57	-
Cercospora	1	7	<1	1/38	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	27	720	30	1/19	64	13632	37	-
Curvularia	-	-	-	-	6	40	<1	-
Epicoccum	1	7	<1	1/12	12	80	<1	-
Fusicladium	5	33	1	1/1	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	45	300	13	-	-	-	-	-
hyphal elements	-	-	-	-	18	120	<1	-
Oidium	1	7	<1	1/2	2	13	<1	-
Penicillium/Aspergillus group	-	-	-	-	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	1	7	<1	-	-	-	-	-
Rusts	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 2				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	136	2367	~100%	1/16	385	37306	~100%	-

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Client Sample Number	GM 61				GM Out 1			
Sample Location	CR61 Portable 21				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-010				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	-	-	-	-	25	667	2	-
basidiospores	32	3413	72	1/6	50	21368	57	-
Cercospora	3	20	<1	1/13	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	35	933	20	1/15	64	13632	37	-
Curvularia	2	13	<1	1/3	6	40	<1	-
Epicoccum	1	7	<1	1/12	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	1	7	<1	1/18	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	43	287	6	1/3	130	867	2	-
Peronospora	1	7	<1	-	-	-	-	-
Pithomyces	-	-	-	-	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	5	33	1	1/3	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	123	4720	~100%	1/8	385	37306	~100%	-

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Client Sample Number	GM 70				GM Out 1			
Sample Location	CR70 Portable 20				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-011				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	2	13	<1	1/50	25	667	2	-
basidiospores	35	1867	47	1/11	50	21368	57	-
Cercospora	2	13	<1	1/19	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	32	1707	43	1/8	64	13632	37	-
Curvularia	-	-	-	-	6	40	<1	-
Epicoccum	1	7	<1	1/12	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	1	7	<1	1/18	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	53	353	9	1/2	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	1	7	<1	1/9	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	4	27	1	1/4	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	131	4000	~100%	1/9	385	37306	~100%	-

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Client Sample Number	GM 71				GM Out 1			
Sample Location	CR71 Portable 19				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-012				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	1	7	<1	1/7	7	47	<1	-
ascospores	9	60	3	1/11	25	667	2	-
basidiospores	32	853	46	1/25	50	21368	57	-
Cercospora	2	13	1	1/19	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	23	613	33	1/22	64	13632	37	-
Curvularia	1	7	<1	1/6	6	40	<1	-
Epicoccum	-	-	-	-	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	3	20	1	1/6	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	34	227	12	1/4	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	8	53	3	1/1	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	1	7	<1	1/1	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	114	1860	~100%	1/20	385	37306	~100%	-

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Attn: Julie Barth
Project: **Glenwood MS**
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 09/02/2015
Date Received: 09/04/2015
Date Analyzed: 09/10/2015
Date Reported: 09/10/2015
Project ID: 15021402
Page 13 of 16

Client Sample Number	GM 80				GM Out 1			
Sample Location	CR80 Portable 24				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-013				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	8	213	3	1/3	25	667	2	-
basidiospores	61	6507	82	1/3	50	21368	57	-
Cercospora	6	40	1	1/6	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	37	987	12	1/14	64	13632	37	-
Curvularia	-	-	-	-	6	40	<1	-
Epicoccum	-	-	-	-	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	2	13	<1	1/9	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	29	193	2	1/4	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	1	7	<1	1/16	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 2				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	144	7960	~100%	1/5	385	37306	~100%	-

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

 Date Collected: 09/02/2015
 Date Received: 09/04/2015
 Date Analyzed: 09/10/2015
 Date Reported: 09/10/2015
 Project ID: 15021402
 Page 14 of 16

Client Sample Number	GM 81				GM Out 1			
Sample Location	CR81 Portable 23				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-014				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	-	-	-	-	7	47	<1	-
ascospores	3	20	1	1/33	25	667	2	-
basidiospores	43	2293	78	1/9	50	21368	57	-
Cercospora	2	13	<1	1/19	38	253	1	-
Chaetomium	-	-	-	-	-	-	-	-
Cladosporium	20	533	18	1/26	64	13632	37	-
Curvularia	1	7	<1	1/6	6	40	<1	-
Epicoccum	-	-	-	-	12	80	<1	-
Fusicladium	-	-	-	-	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	-	-	-	-	-	-	-	-
hyphal elements	-	-	-	-	18	120	<1	-
Oidium	-	-	-	-	2	13	<1	-
Penicillium/Aspergillus group	9	60	2	1/14	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	1	7	<1	1/9	9	60	<1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	16	107	<1	-
Tetraploa	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 2				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	79	2933	~100%	1/13	385	37306	~100%	-

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

 Date Collected: 09/02/2015
 Date Received: 09/04/2015
 Date Analyzed: 09/10/2015
 Date Reported: 09/10/2015
 Project ID: 15021402
 Page 15 of 16

Client Sample Number	GM Out 2				GM Out 1			
Sample Location	Outside Courtyard Between CR 24 and 12				Outside Near Portable 19			
Sample Volume (L)	150				150			
Lab Sample Number	15021402-016				15021402-015			
Spore Identification	Raw Ct	spr/m ³	% Ttl	In/Out	Raw Ct	spr/m ³	% Ttl	In/Out
Alternaria	13	87	<1	2/1	7	47	<1	-
ascospores	24	1280	4	2/1	25	667	2	-
basidiospores	40	17094	51	1/1	50	21368	57	-
Cercospora	47	313	1	1/1	38	253	1	-
Chaetomium	2	13	<1	-	-	-	-	-
Cladosporium	60	12780	38	1/1	64	13632	37	-
Curvularia	7	47	<1	1/1	6	40	<1	-
Epicoccum	16	107	<1	1/1	12	80	<1	-
Fusicladium	6	40	<1	1/1	5	33	<1	-
Gliomastix	-	-	-	-	-	-	-	-
Helicosporium/Helicomyces	1	7	<1	-	-	-	-	-
hyphal elements	22	147	<1	1/1	18	120	<1	-
Oidium	1	7	<1	1/2	2	13	<1	-
Penicillium/Aspergillus group	149	993	3	1/1	130	867	2	-
Peronospora	-	-	-	-	-	-	-	-
Pithomyces	28	187	1	3/1	9	60	<1	-
Polythrincium	2	13	<1	2/1	1	7	<1	-
Pyricularia	2	13	<1	-	-	-	-	-
Rusts	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	19	127	<1	1/1	16	107	<1	-
Tetraploa	1	7	<1	-	-	-	-	-
Torula	5	33	<1	-	-	-	-	-
Unknown	-	-	-	-	1	7	<1	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 7 spr/m³				Analytical Sensitivity: 7 spr/m³			
Comments								
Total *See Footnotes	445	33294	~100%	1/1	385	37306	~100%	-

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

Date Collected: 09/02/2015
Date Received: 09/04/2015
Date Analyzed: 09/10/2015
Date Reported: 09/10/2015
Project ID: 15021402
Page 16 of 16

Footnotes and Additional Report Information

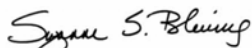
Debris Rating Table

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/m³ 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/m³.
15. If the In/Out ratio is greater than 100 times it is indicated >100/1, rather than showing the real value.

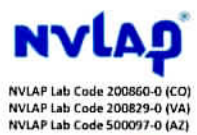
Terminology Used in Direct Exam Reporting

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

15 021402
 15021402



Aerobiology Client Aria Environmental, Inc.		Collected By/Date: 9/2/15 <i>JP</i>		Relinquished By/Date: 9/2/15 <i>UPS</i>	
Field Contact	Julie Barth	Relinquished By/Date:		Received By/Date: 04 Sep 2015	
Reporting Address	PO Box 286, Woodbine, MD 21797	Relinquished By/Date:		Received By/Date:	
Billing Address	Same	Sampler Type	Andersen <input type="checkbox"/> SAS <input type="checkbox"/>	Sample Aire	Other <input type="checkbox"/> AllergencoD <input type="checkbox"/> Aero Trap <input type="checkbox"/> BioCulture <input type="checkbox"/>
Phone/Fax	410-549-5774/410-549-4488	PO#/Job#: J15-876			
Reporting Email (s)	jbarth@ariaenviro.com	Project Name: Glenwood MS			
Routine <input checked="" type="radio"/>	24 Hour <input type="radio"/> Same Day <input type="radio"/> 4 Hour <input type="radio"/> 2 Hour <input type="radio"/>	5 Day (Asbestos Only)		Notes:	
SAMPLING LOCATION ZIP CODE 21738		CC Info:			

Sample No.	Test Code	Sample Location	Total Volume/Area
1 GM 04	1054	CR 04	150 L
2 GM 05		CR 05	
3 GM 16		CR 16	
4 GM 17		CR 17	
5 GM 23		CR 23	
6 GM 32		CR 32	
7 GM 39		CR 39 Tech Ed Lab	
8 GM 40		CR 40 Tech Ed CR	
9 GM 60		CR 60 Portable 22	
10 GM 61		CR 61 Portable 21	
11 GM 70		CR 70 Portable 20	
12 GM 71		CR 71 Portable 19	
13 GM 80		CR 80 Portable 24	
14 GM 81		CR 81 Portable 23	

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

Lab Use:
15021402



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

AZ, CO, GA, VA, NJ

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

Aerobiology Client		Aria Environmental, Inc.	
Field Contact	Julie Barth	Collected By/Date:	9/2/15
Reporting Address	PO Box 286, Woodbine, MD 21797	Relinquished By/Date:	9/2/15 UPS
Billing Address	Same	Received By/Date:	CM 04 SEP 2015
Phone/Fax	410-549-5774/410-549-4488	Sampler Type	Andersen SAS
Reporting Email (s)	jbarth@ariaenviro.com	Sample Aire	AeroTrap
Routine	<input checked="" type="radio"/> 24 Hour <input type="radio"/> Same Day <input type="radio"/> 4 Hour <input type="radio"/> 2 Hour	Other	AllerjencoD
SAMPLING LOCATION ZIP CODE		21738	CC Info:
Project Name:		Glenwood MS	
Notes:		5 Day (Asbestos Only)	

Sample No.	Test Code	Sample Location	Total Volume/Area
1	Gm Out 1	1054 Outside near Portable 19	150 L
2	Gm out 2	1054 Outside Courtyard between R 24+12	150 L
3			
4			
5			
6			
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@pureearthlab.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: social@aerobiology.net
 2228 West Northern Avenue, Suite B110, Phoenix, AZ 85021 - (855) 738-5619 Fax (602) 441-2818 - email: phoenix@aerobiology.net