4221 Forbes Boulevard · Suite 250
Lanham, Maryland 20706
T: 202.558.7487 | http://atiinc.com/

May 29, 2019

Prince George's County Public Schools
13300 Old Marlboro Pike
Upper Marlboro, Maryland 20772
Attention: Mr. Alex Baylor

RE: Indoor Air Quality Screening, Judge Sylvania Woods Elementary School
IFB: 022-19
ATI Project Number: ATI19-665

Dear Mr. Baylor:

Prince George's County Public Schools requested that ATI, Inc., conduct a proactive indoor air quality (IAQ) screening at Judge Sylvania Woods Elementary School. The IAQ screening was conducted on May 16, 2019. Its key findings are enclosed in the Executive Summary on page three, and the official laboratory report for total fungal spore trap sampling is enclosed in Appendix A.

Thank you for the opportunity to provide Industrial Hygiene services for Prince George's County Public Schools. If you have any questions regarding this report, please contact us at (202) 643-4283.

Sincerely,
ATI, INC.

Courtney E. McCall
Project Manager

Sarath Seneviratne
CIH, CSP, CHMM

Indoor Air Quality Screening Report

Prince George's County Public Schools
Judge Sylvania Woods Elementary School
3000 Church St.
Glenarden, Maryland 20706

Prepared for:

Prince George's County Public Schools
13300 Old Marlboro Pike
Upper Marlboro, Maryland 20772

May 29, 2019

Submitted by:

ati

ATI Job # 19-665

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Table of Contents

Abbreviations and Acronyms

AHU	Air-Handling Unit
AIHA	American Industrial Hygiene Association
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASTM	American Society for Testing and Materials
CO	Carbon Monoxide
CO_2	Carbon Dioxide
EMLAP	Environmental Microbiology Laboratory Accreditation Program
HVAC	Heating, Ventilating, And Air-Conditioning
IAQ	Indoor Air Quality
NIST	National Institute for Standards and Technology
NVLAP	National Voluntary Laboratory Accreditation Program
RH	Relative Humidity

Abbreviations involving scientific volume and measurements involving media or water sampling

Counts/m^3	Mold spores per cubic meter of air
LPM	Liters Per Minute
NTE	Not to exceed
°F	degree Fahrenheit
PPM	Parts Per Million

1. Executive Summary and Key Findings

ATI conducted a proactive Indoor Air Quality (IAQ) screening on May 16, 2019, at Judge Sylvania Woods Elementary School, located at 3000 Church St., Glenarden, MD 20706.

The screening included a visual assessment of randomly selected classrooms and other frequently occupied spaces, such as the cafeteria, the main office, and classrooms, for potential IAQ contributors and pathways. As part of the screening, ATI collected direct reading measurements for comfort parameters, including temperature, relative humidity, carbon dioxide, and carbon monoxide. Also, ATI collected total fungal air samples on spore trap cassettes for microbiological analysis.

The following is a summary of the key findings from this screening:

1. Temperature measurements were slightly below and on the lower end of ASHRAE guidelines for summer temperatures, 73°F and 79°F.
2. Relative humidity measurements were within ASHRAE guidelines, <65%.
3. Three of the eight tested locations exceeded the recommended ASHRAE limit for carbon dioxide, which was 1,168 parts per million (PPM) for the day of sampling.
4. Carbon monoxide was not detected throughout the tested spaces.
5. Laboratory results indicated that Basidiospores had the highest concentrations in sampled areas, followed by Ascospores. Other low concentrations of additional spore types were detected at levels that do not pose a concern. Overall, results were favorable with total counts of spores detected indoors not exceeding those detected outdoors.

2. Assessment Methods

Ms. Mikal Frater of ATI, Inc. conducted a visual assessment and air sampling on May 16, 2019. Sampled rooms were randomly selected and accounted for approximately 10% of classrooms or a minimum of five samples. Visual observations were made at the time the samples were collected. ATI references the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) *Standard 62.1 – 2016* and ASHRAE *Standard 55 – 2017* when providing IAQ services to clients. ASHRAE is an industry leader on energy efficiency and indoor air quality.

All measurements and air samples were collected between three-six feet from floor elevation, which represents the breathing zone, and away from air-supply and return diffusers. Real-time direct readings for temperature, relative humidity, carbon dioxide (CO_2), and carbon monoxide (CO), were obtained with a calibrated TSI Q-Trak 7575-X Meter and attached 982 Probe.

Total fungal air samples were collected with a Buck BioAire High-Volume Sampling Pump on Zefon Air-O-Cell spore-trap cassettes at a flow rate of 15 liters per minute for five minutes, for a sample volume of 75 liters. The samples were analyzed by direct microscopic examination (identifies and counts both viable and non-viable spores, which is then considered “total fungal”), via the American Society for Testing and Materials (ASTM) Standard D7391-09 by EMSL Analytical, Inc., (EMSL) located in Beltsville, MD.

EMSL participates in the National Institute of Standards and Technology's (NIST's) National Voluntary Laboratory Accreditation Program (NVLAP) for general laboratory performance and management and the American Industrial Hygiene Association (AIHA) Environmental Microbial Laboratory Accreditation Program (EMLAP, Certificate Number 102891).

Instrument calibration records are included in Appendix B of this report.

3. Visual Observations

Table 1: Visual Observations and Sampling Locations

Sample Location	Observations
General Notes	• Air filters are replaced every three to four months. • Ceiling tiles are monitored for leaks and replaced as needed. • History of leaks date back 2-3 years. • Most recent leak: Summer 2018. Water emerged from drains in hallway. Leak damage can be seen in yellow on floor plan. • There is a visible leak coming from the 3-way valve in the storage closet adjacent to the teacher's lounge. • Roof drain may be clogged, according to building manager, Mr. James Thomas.
Outside	• Light drizzle. • Cloudy skies. • Winds blowing South at 6mph. • Light foot traffic.
Main Office	• According to staff, A/C has been off for a few days – they have been keeping the door to the corridor open to let fresh air inside. • Five table plants. • Office space splits into 5-6 additional rooms. • Smells of air freshener – cannot locate source. • One air return, two air diffusers. • Space is approximately 1,320ft.^{2} • Seven occupants in area during sampling. • Light foot traffic.
Music Room 17	• One wall unit, supplying both A/C and heat. • Staff complaints of throat and nose issues, and noticeable odor when A/C is on (A/C off – unable to confirm). • Wall cabinet removed along wall. • Sound barrier request for removal denied, but also not cleaned (per staff). • History of water running down wall where cabinet was removed. • Dark brown water stain on ceiling tile. • Twenty-two occupants in room. • Space is approximately 910ft.^{2} • Windows are out of reach and unable to be opened regularly to let fresh air in.
Room 13B	• One wall unit. • Ceiling tile recently replaced.

Sample Location	Observations
	• Possible 3-way valve leak above ceiling tile. • Water stains on floor tiles near wall unit. • Staff complains of headaches when A/C unit is on. • Four occupants in area during sampling. • Space is approximately 420 ft.^{2}
Room 12	• Plants near window. • One wall unit – OFF. • No visible mold or dust accumulation in room. • Twenty occupants in area during sampling. • Looks as though few ceiling tiles have been replaced. • Space is approximately 840 ft.^{2}
Room 5	• One ceiling tile infiltrated by 3-way valve leak previous week has been removed. • Tile next to removed tile space also has light brown water stain. • Water leak reported from bottom of cabinets and wall units. No visible remnants. • Twenty-nine occupants in area during sampling. • Space is approximately 960 ft.^{2}
Cafeteria	• Only panels separating cafeteria from gym – potential for air to be circulated between the two areas. • Eight occupants in area during sampling. • Light brown water-stained ceiling tile, indicative of past leak. • Space is approximately 2,600 ft.^{2}
Room 23	• One wall unit in room. • Three occupants in area during sampling. • Bathroom in classroom. • Air is slightly stuffy. • Very light brown water-stained ceiling tiles near wall unit. • Space is approximately 770 ft.^{2}
Room 31	• Air is humid and stuffy. • One wall unit in room. • Twenty-two occupants in area during sampling. • No water-stained ceiling tiles. • Soil plants near window and wall unit (27). • Sitting water in pail near window. • Filter protruding from bottom of wall unit. • Space is approximately 820 ft.^{2}

4. Thermal Environmental Conditions for Human Occupancy

ASHRAE *Standard 55-2017, Thermal Environmental Conditions for Human Occupancy*, addresses thermal comfort in an office environment, which means that an employee wearing a normal amount of clothing feels neither too cold nor too warm. This standard discusses thermal comfort within the context of air temperature, humidity, and air movement and provides recommended ranges for temperature and humidity that are

intended to satisfy most building occupants. The recommended ASHRAE ranges are referenced below by each comfort parameter.

4.1 Temperature

The ASHRAE standard establishes a winter comfort range of between 68°F and 75°F and a summer range of between 73°F and 79°F. The temperature measurements obtained during the May 16, 2019, screening is summarized in Table 2. As indicated by the data in the table, temperatures in the school averaged between 69.05 - 74.4°F, below and on the lower end of the ASHRAE summer comfort range.

Table 2: Temperature Measurements

Sample Location	May 16, 2019 °F			ASHRAE Standard °F
	Min	Max	Average	
Outside	61.6	62.4	62.0	N/A
Indoors				
Main Office	73.6	73.6	73.6	73 – 79
Music Room 17	68.8	69.3	69.05	73 – 79
Room 13B	70.0	70.6	70.3	73 – 79
Room 12	70.6	70.6	70.6	73 – 79
Room 5	70.2	70.2	70.2	73 – 79
Cafeteria	70.4	70.6	70.5	73 – 79
Room 23	71.2	71.8	71.5	73 – 79
Room 31	74.2	74.6	74.4	73 – 79

4.2 Relative Humidity

Relative humidity is a key factor for mold growth. Mold has the potential of growing on suitable surfaces with humidity levels above 65%. ASHRAE *Standard 62.1-2016*, *Ventilation for Acceptable Indoor Air Quality,* recommends a maximum indoor relative humidity of 65% to prevent condensation of moisture on surfaces. Relative humidity below 30% may result in drying of the mucous membranes and skin. Relative humidity measurements are summarized in Table 3. As indicated by the data in the table, relative humidity measurements averaged between 49.5 and 59.95%, below the ASHRAE maximum recommendation of 65% relative humidity.

Table 3: Relative Humidity Measurements

Sample Location	May 16, 2019 (%)			ASHRAE Standard (% RH)
	Min	Max	Average	
Outside	61.0	63.8	62.4	N/A
Inside				
Main Office	49.5	49.5	49.5	< 65
Music Room 17	59.5	60.4	59.95	< 65
Room 13B	55.5	56.5	56.0	< 65
Room 12	56.9	57.3	57.1	< 65
Room 5	56.2	56.4	56.3	< 65
Cafeteria	54.6	54.6	54.6	< 65
Room 23	53.0	54.4	53.7	< 65
Room 31	54.9	55.4	55.15	< 65

4.3 Carbon Dioxide

Carbon dioxide measurements within an occupied building are a standard method used to gauge the efficiency of ventilation systems. Carbon dioxide is a by-product of human respiration and does not pose an acute health hazard alone. Elevated concentrations may suggest that insufficient fresh air is being supplied to an occupied space and/or that the ventilation system does not provide a sufficient rate of air exchange.

Research has indicated that buildings with adequately operating ventilation systems are able to remove odors generated by activities in an indoor office environment efficiently. ASHRAE *Standard 62.1-2016* states that comfort (odor) criteria with respect to human bioeffluents are likely to be satisfied if the ventilation results indoor carbon dioxide concentrations are less than 700 parts per million (ppm) above the outdoor air concentration.

Carbon dioxide measurements are summarized in Table 4. On the day of the screening, the average outdoor carbon dioxide concentration obtained was 468 ppm, which calculates to a maximum indoor concentration of 1,168 ppm (700 + 468). The carbon dioxide levels inside the school ranged from the minimum detected, 798 ppm to 1,990 ppm, the maximum detected, with three locations exceeding the maximum recommended concentration of 1,168 ppm.

Table 4: Carbon Dioxide Measurements

Sample Location	May 16, 2019 Concentration (parts per million)			ASHRAE Standard (ppm) NTE
	Min	Max	Average	
Outside	467	469	468	N/A
Inside				
Main Office	798	804	801	1,168
Music Room 17	1157	1193	1,175	1,168
Room 13B	800	896	848	1,168
Room 12	1,463	1,463	1,463	1,168
Room 5	949	957	953	1,168
Cafeteria	896	916	906	1,168
Room 23	977	997	987	1,168
Room 31	1,976	1,990	1,983	1,168

4.4 Carbon Monoxide

Carbon monoxide is a colorless and odorless gas produced by the incomplete combustion of carbon containing fuels. Oil, gasoline, diesel fuels, wood, coke, and coal are the major sources of carbon monoxide. ASHRAE recommends that carbon monoxide not exceed nine ppm indoors. As indicated by the data in Table 5, carbon monoxide was not detected throughout the suite.

Table 5: Carbon Monoxide Measurements

Sample Location	May 16, 2019 Concentration (parts per million)			ASHRAE Standard (ppm)
	Min	Max	Average	
Outside	0	0	0	N/A
Inside				
Main Office	0	0	0	< 9
Music Room 17	0	0	0	< 9
Room 13B	0	0	0	< 9
Room 12	0	0	0	< 9
Room 5	0	0	0	< 9
Cafeteria	0	0	0	< 9
Room 23	0	0	0	< 9
Room 31	0	0	0	< 9

5. Total Fungal Air Sampling Results

Mold needs a food source, moisture, proper temperature and humidity, and at times, a source of light, to grow in an environment. Air infiltration through building entrances and exits, open windows and loading docks, and foot traffic into buildings, including the HVAC system all serve as primary pathways that can carry fungi indoors. Water leaks and humid conditions inside of buildings provide the moisture that fosters mold growth.

The May 16, 2019, mold screening sampled air using spore trap cassettes in randomly selected classrooms and other areas throughout the facility. These cassettes collect both viable spores, those capable of producing more fungal colonies, and non-viable spores, which cannot reproduce. Based upon recognized industry practices, indoor mold concentrations are compared with those detected outdoors, which are also known as ambient or baseline samples.

In normal circumstances, the diversity of spores identified indoors and outdoors should be similar with some exceptions. The high concentration of one or two species of fungal spores identified indoors and the absence of the same species outdoors can indicate a moisture problem with the potential to degrade the air quality. Fungi species present indoors are typically found at levels ranging from approximately 10-50% of their levels in the outdoor air, reflecting the filtering by the building's HVAC system.

The official laboratory report with spore trap samples collected on May 16, 2019, is presented in Appendix A. The findings indicated that the indoor concentrations were favorable compared to the outdoor concentrations, and indoor amplification was not present. The total spore counts detected indoors in each tested room did not exceed the total quantity detected outdoors.

Basidiospores had the highest concentration, followed by Ascospores. Basidiospores are common outdoor fungi with the potential to enter building spaces though main entrances, opened windows, or via building envelopes. They may pose allergy-like symptoms but are not a fungi to be associated with water damaged building materials within the Mid-Atlantic region. Ascospores are a widespread outdoor fungi that have been known to cause allergies.

6. Summary of Findings

Temperature measurements were slightly below ASHRAE guidelines for summer temperatures, 73°F and 79°F. Relative humidity measurements were within ASHRAE guidelines, <65%. Three of the eight tested locations exceeded the recommended ASHRAE limit for carbon dioxide, which was 1,168 parts per million (PPM). Carbon monoxide was not detected throughout the tested spaces.

Laboratory results indicated that Basidiospores had the highest concentrations in sampled areas, followed by Ascospores. Other low concentrations of additional spore types were detected at levels that do not pose a concern.

We appreciate the opportunity to provide these IAQ testing services for you. If you have any questions, please contact us at (202) 643-4283.

Sincerely,
ATI, INC.

Courtney E. McCall
Project Manager

Sarath Seneviratne
CIH, CSP, CHMM

Appendix A:
Laboratory Report and Chain of Custody

EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514

Tel/Fax: (516) 997-7251 / (516) 997-7528

http://www.EMSL.com / carleplacelab@emsl.com

EMSL Order: 061909642
Customer ID: ATII25A
Customer PO:
Project ID:

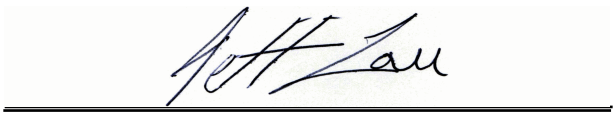
Attn: Brian Chapman
ATI
4221 Forbes Blvd
Suite 250
Lanham, MD 20706
Project: 19-665-PGCPS-Judge Woods ES

Phone: (202) 368-1376
Fax:
Collected: 05/16/2019
Received: 05/16/2019
Analyzed: 05/22/2019

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	061909642-0001			061909642-0002			061909642-0003		
Client Sample ID:	19-665-01			19-665-02			19-665-03		
Volume (L):	75						75		
Sample Location	Outside Parking Lot			Field Blank			Main Office		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	95	4100	11.5	-	-	-	8	300	17.8
Aspergillus/Penicillium	17	740	2.1	-	-	-	1	40	2.4
Basidiospores	469	20500	57.5	-	-	-	19	830	49.1
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	235	10300	28.9	-	-	-	11	480	28.4
Curvularia	2*	30*	0.1	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	1	40	2.4
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Pestalotia/Pestalotiopsis	-	-	-	-	-	-	-	-	-
Spegazzinia	-	-	-	-	-	-	-	-	-
Torula-like	-	-	-	-	-	-	-	-	-
Triadelphia	-	-	-	-	-	-	-	-	-
Total Fungi	**818**	**35670**	**100**	**-**	**No Trace**	**-**	**40**	**1690**	**100**
Hyphal Fragment	1	40	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	5	200	-	-	-	-	1	40	-
Analyt. Sensitivity 600x	-	44	-	-	0	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	0*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	-	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	-	-	-	1	-
Background (1-5)	-	2	-	-	-	-	-	2	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.



Jeffrey Lau, Microbiology Laboratory Manager
or other approved signatory

Initial report from: 05/23/2019 14:17:51

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.

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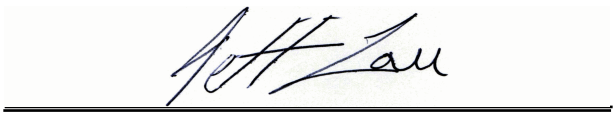
Fax:
Collected: 05/16/2019
Received: 05/16/2019
Analyzed: 05/22/2019

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	061909642-0004			061909642-0005			061909642-0006		
Client Sample ID:	19-665-04			19-665-05			19-665-06		
Volume (L):	75			75			75		
Sample Location	Music Room 17			Room 13B			Room 12		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	7	300	16	32	1400	24.3	14	610	20.7
Aspergillus/Penicillium	4	200	10.7	4	200	3.5	6	300	10.2
Basidiospores	26	1100	58.8	84	3700	64.3	43	1900	64.4
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	3	100	5.3	9	400	7	2	90	3.1
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	1*	10*	0.3
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	2*	30*	1.6	1	40	0.7	1	40	1.4
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	2	90	4.8	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Pestalotia/Pestalotiopsis	-	-	-	-	-	-	-	-	-
Spegazzinia	-	-	-	1*	10*	0.2	-	-	-
Torula-like	1*	10*	0.5	-	-	-	-	-	-
Triadelphia	1	40	2.1	-	-	-	-	-	-
Total Fungi	**46**	**1870**	**100**	**131**	**5750**	**100**	**67**	**2950**	**100**
Hyphal Fragment	6	300	-	2	90	-	1	40	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	4	200	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	3	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	2	-	-	2	-	-	2	-
Background (1-5)	-	3	-	-	3	-	-	3	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.



Jeffrey Lau, Microbiology Laboratory Manager
or other approved signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Carle Place, NY AIHA-LAP, LLC--EMLAP Accredited #102344

Initial report from: 05/23/2019 14:17:51

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

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Collected: 05/16/2019
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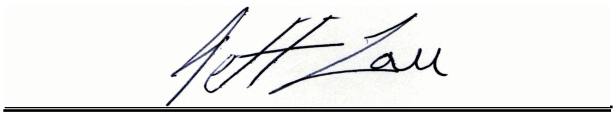
Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	061909642-0007			061909642-0008			061909642-0009		
Client Sample ID:	19-665-07			19-665-08			19-665-09		
Volume (L):	75			75			75		
Sample Location	Room 5			Cafeteria			Room 23		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	15	660	18.9	15	660	24.4	18	790	27.5
Aspergillus/Penicillium	4	200	5.7	3	100	3.7	4	200	7
Basidiospores	51	2200	62.9	36	1600	59	41	1800	62.7
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	9	400	11.4	7	300	11.1	1	40	1.4
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1	40	1.1	1*	10*	0.4	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Pestalotia/Pestalotiopsis	-	-	-	1	40	1.5	1	40	1.4
Spegazzinia	-	-	-	-	-	-	-	-	-
Torula-like	-	-	-	-	-	-	-	-	-
Triadelphia	-	-	-	-	-	-	-	-	-
Total Fungi	**80**	**3500**	**100**	**63**	**2710**	**100**	**65**	**2870**	**100**
Hyphal Fragment	2	90	-	2	90	-	3	100	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	3	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	2	-	-	2	-	-	1	-
Background (1-5)	-	3	-	-	3	-	-	3	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.



Jeffrey Lau, Microbiology Laboratory Manager
or other approved signatory

Initial report from: 05/23/2019 14:17:51

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514

Tel/Fax: (516) 997-7251 / (516) 997-7528

http://www.EMSL.com / carleplacelab@emsl.com

EMSL Order: 061909642
Customer ID: ATII25A
Customer PO:
Project ID:

Attn: Brian Chapman
ATI
4221 Forbes Blvd
Suite 250
Lanham, MD 20706
Project: 19-665-PGCPS-Judge Woods ES

Phone: (202) 368-1376
Fax:
Collected: 05/16/2019
Received: 05/16/2019
Analyzed: 05/22/2019

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	**061909642-0010**		
Client Sample ID:	**19-665-10**		
Volume (L):	**75**		
Sample Location	**Room 31**		

Spore Types	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-
Ascospores	12	520	29.7
Aspergillus/Penicillium	8	300	17.1
Basidiospores	20	870	49.7
Bipolaris++	-	-	-
Chaetomium	1	40	2.3
Cladosporium	-	-	-
Curvularia	1*	10*	0.6
Epicoccum	-	-	-
Fusarium	-	-	-
Ganoderma	-	-	-
Myxomycetes++	1*	10*	0.6
Pithomyces++	-	-	-
Rust	-	-	-
Scopulariopsis/Microascus	-	-	-
Stachybotrys/Memnoniella	-	-	-
Unidentifiable Spores	-	-	-
Zygomycetes	-	-	-
Pestalotia/Pestalotiopsis	-	-	-
Spegazzinia	-	-	-
Torula-like	-	-	-
Triadelphia	-	-	-
Total Fungi	**43**	**1750**	**100**
Hyphal Fragment	3	100	-
Insect Fragment	-	-	-
Pollen	2	90	-
Analyt. Sensitivity 600x	-	44	-
Analyt. Sensitivity 300x	-	13*	-
Skin Fragments (1-4)	-	4	-
Fibrous Particulate (1-4)	-	2	-
Background (1-5)	-	3	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Jeffrey Lau, Microbiology Laboratory Manager
or other approved signatory

Initial report from: 05/23/2019 14:17:51

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

OrderID: 061909642

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*): 061909642

EMSL ANALYTICAL, INC.
200 ROUTE 130 NORTH
CINNAMINSON, NJ 08077
PHONE: (800) 220-3675
FAX:(856) 786-0262

Company Name: ATI, Inc	**EMSL-Bill to:** ☐ Same ☐ Different If Bill to is Different note instructions in Comments
Street: 4221 Rumsey Road, Suite 250	*Third Party Billing requires written authorization from third party.*
City: Lanham **State/Province:** MD	**Zip/Postal Code:** 20706 **Country:**
Report To (Name): Brian Chapman / Mikal Frater	**Telephone #:** 202-558-7489
Email Address: Brian@atiin.com & Mikal@atiinc.com	**Fax #:** **Purchase Order:**
Project Name/Number: 19-665- PGCPS - Judge Woods ES	**Please Provide Results:** ☐ Fax ■ Email

U.S. State Samples Taken: **Project Zip Code:** **Connecticut Samples:** ■ Commercial ☐ Residential

Sterile, Sodium Thiosulfate Preserved Bottle Used: ☐ **Biocide Used in Source (specify):** ☐

Public Water Supply Samples: ☐ **Note: All results may automatically be reported to DOH if required by state.**

Turnaround Time (TAT) Options - Please Check

☐ 3 Hour	☐ 6 Hour	☐ 24 Hour	☐ 48 Hour	☐ 72 Hour	☐ 96 Hour	■ 1 Week	☐ 2 Week

Microbiology Test Codes

M001 Air-O-Cell
M174 MoldSnap
M030 Micro 5
M032 Allergenco-D

M041 Fungal Direct Examination
M169 Pollen ID & Enumeration
M280 Dust Characterization Level-1
M281 Dust Characterization Level-2
M005 Viable Fungi- Air Samples (Genus ID & Count)
M006 Viable Fungi- Air Samples (Includes *Penicillium, Aspergillus, Cladosporium, Stachybotrys* Species ID & Count)
M007 Culturable fungi - Surface Samples (Genus ID & Count)
M008 Culturable fungi - Surface Samples (Includes *Penicillium, Aspergillus, Cladosporium, Stachybotrys* Species ID & Count)
M009 Bacteria Culture Gram Stain & Count
M010 Bacteria Count & ID - 3 Most Prominent
M011 Bacteria Count & ID - 5 Most Prominent

M012 *Pseudomonas aeruginosa* (P/A***)
M024 *Pseudomonas aeruginosa* (MFT*)
M015 Heterotrophic Plate Count
M017 Total Coliform & *E. coli* (Colilert P/A***)
M018 Total Coliform & *E. coli* (MFT*)
M114 Total Coliform & *E. coli* Enumeration (Colilert MPN**)
M019 Fecal Coliform (MFT*)
M020 Fecal *Streptococcus* (MFT*)
M029 *Enterococci* (MFT*)
M129 *Enterococci* (Enterolert P/A***)
M180 Real Time qPCR-ERMI 36 Panel
M025 Sewage Screen –Water (MFT*)

M115 Sewage Screen - Water (P/A***)
M116 Sewage Screen - Water (MPN**)
M117 Sewage Screen - Swab (P/A***)
M013 Sewage Screen - Swab (MFT*)
M133 *Methicillin-resistant Staph. aureus* (MRSA)
M031 Rapid-growing non-TB *Mycobacteria* Detection & Enumeration
M014 Endotoxin Analysis
M044 Group Allergen (Cat, Dog, Cockroach, Dust Mite)
Other See Analytical Price Guide
***Legionella* Analysis** Please use EMSL *Legionella* COC

*MFT= Membrane Filtration Technique
**MPN= Most Probable Number
***P/A= Presence/Absence

Name of Sampler: Mikal Frater **Signature of Sampler:** Mikal Frater

Sample #	Sample Location/Description	Sample Type	Potable/ NonPotable (Only for Waters)	Test Code	Volume/ Area	Date/Time Collected	Temperature (°C) (Lab Use Only)
Example A1	Kitchen Sink/Tap	Water	☒ P ☐ NP	M017	100 mL	9/1/13 4:00 PM	
19-665-01	Outside Parking Lot	Air	☐ P ☐ NP	M001	75L	05-16-19 - 7:45	
19-665-02	Field Blank	Air	☐ P ☐ NP	M001	75L	05-16-19 -	
19-665-03	Main Office	Air	☐ P ☐ NP	M001	75L	05-16-19 - 9:52	
19-665-04	Music Room 17	Air	☐ P ☐ NP	M001	75L	05-16-19 - 8:42	
19-665-05	Room 13B	Air	☐ P ☐ NP	M001	75L	05-16-19 - 8:53	

Client Sample # (s): - 10 **Total # of Samples:** 10 **Samples Received Chilled?** Yes / No (Lab Use Only)

Relinquished (Client): L. Kenneth Walker Jr. **Date** 5-16-19 **Time:**

Received (Lab): **Date:** 5/16/19 **Time:** 3:57 pm

Comments/Special Instructions:

Controlled Document – COC-34 Micro R8 11/14/2017

5/22/19

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*):

EMSL ANALYTICAL, INC.
200 ROUTE 130 NORTH
CINNAMINSON, NJ 08077
PHONE: (800) 220-3675
FAX:(856) 786-0262

Additional pages of the chain of custody are only necessary if needed for additional sample information.

Sample #	Sample Location/Description	Sample Type	Potable/ NonPotable (Only for Waters)	Test Code	Volume/ Area	Date/Time Collected	Temperature (°C) (Lab Use Only)
19-665-06	Room 12	Air	☐ P ☐NP	M001	75L	05-16-19 - 9:03	
19-665-07	Room 5	Air	☐ P ☐NP	M001	75L	05-16-19- 9:14	
19-665-08	Cafeteria	Air	☐ P ☐NP	M001	75L	05-16-19 9:22	
19-665-09	Room 23	Air	☐ P ☐NP	M001	75L	05-16-19 9:33	
19-665-10	Room 31	Air	☐ P ☐NP	M001	75L	05-16-19 9:42	
			☐ P ☐NP				
			☐ P ☐NP				
			☐ P ☐NP				
			☐ P ☐NP				
			☐ P ☐NP				
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			☐ P ☐NP				
			☐ P ☐NP				
			☐ P ☐NP				
			☐ P ☐NP				

Comments/Special Instructions:

Controlled Document – COC-34 Micro R8 11/14/2017

Appendix B:
Instrument Calibration Records

CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

ENVIRONMENT CONDITIONS		
TEMPERATURE	75.0 (23.9)	°F (°C)
RELATIVE HUMIDITY	45	%RH
BAROMETRIC PRESSURE	28.83 (976.3)	inHg (hPa)

MODEL	982
SERIAL NUMBER	P17100006

☐ AS LEFT ☐ IN TOLERANCE
☒ AS FOUND ☒ OUT OF TOLERANCE

– CALIBRATION VERIFICATION RESULTS –

GAS CO_2 AS FOUND — SYSTEM G-101 — *Unit: ppm*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	0	0	0~50	4	3033.5	* 2860.4	2942.5~3124.5
2	523.8	* 470.7	473.8~573.8	5	5060	* 4739.5	4908.2~5211.8
3	1025	* 960.5	975~1075				

GAS CO AS FOUND — SYSTEM G-101 — *Unit: ppm*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	36	* 0	33~39	2	101.3	* 0	98.2~104.3

TEMPERATURE AS FOUND — SYSTEM T-101 — *Unit: °F (°C)*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	32.0 (0.0)	32.4 (0.2)	31.0~33.0 (−0.6~0.6)	2	140.0 (60.0)	140.8 (60.4)	139.0~141.0 (59.4~60.6)

HUMIDITY AS FOUND — SYSTEM H-102 — *Unit: %RH*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	10.0	9.8	7.0~13.0	4	70.0	72.5	67.0~73.0
2	30.0	30.6	27.0~33.0	5	90.02	* 93.27	87.02~93.02
3	49.9	51.6	46.9~52.9				

**Indicates Out-of-Tolerance Condition*

TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to the United States National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. TSI's calibration system is registered to ISO-9001:2015.

Measurement Variable	System ID	Last Cal.	Cal. Due
5000 CO_2	T-0926	02-15-18	12-18-20
N2	t78516	04-17-18	04-03-23
Flow	E003298	10-25-17	10-31-18
Flow	E003980	03-28-18	03-31-19
2000 C4H8	EB0053919	10-20-17	10-20-21
Temperature	E003986	02-14-18	08-31-18
Humidity	E003539	02-22-18	08-31-18

Measurement Variable	System ID	Last Cal.	Cal. Due
200 CO	CC506122	01-24-18	01-25-26
Air	108551y	04-23-18	03-09-20
Flow	E004631	10-25-17	10-31-18
Flow	E003525	01-10-18	01-31-19
100 C4H8	EB0078607	09-28-16	09-28-20
Temperature	E003987	02-14-18	08-31-18

Ken Davey
VERIFIED

May 25, 2018
DATE

Doc ID: CERT_GEN_WCC

TSI P/N 2300157

TSI P/N 2300157

CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Conditions		
Temperature	75.9 (24.4)	°F (°C)
Relative Humidity	46	%RH
Barometric Pressure	28.81 (975.6)	inHg (hPa)

Model	982
Serial Number	P17100006

☒ As Left ☐ As Found

☒ In Tolerance ☐ Out of Tolerance

– Calibration Verification Results –

Temperature Verification — System T-101 — *Unit: °F (°C)*

#	Standard	Measured	Allowable Range	#	Standard	Measured	Allowable Range
1	32.0 (0.0)	32.4 (0.2)	31.0~33.0 (−0.6~0.6)	2	140.0 (60.0)	140.8 (60.4)	139.0~141.0 (59.4~60.6)

Humidity Verification — System H-102 — *Unit: %RH*

#	Standard	Measured	Allowable Range	#	Standard	Measured	Allowable Range
1	10.0	9.6	7.8~12.2	4	70.0	69.7	67.8~72.2
2	30.0	29.7	27.8~32.2	5	90.0	89.3	87.8~92.2
3	50.0	49.9	47.8~52.2				

CO_2 Gas Verification — System G-101 — *Unit: ppm*

#	Standard	Measured	Allowable Range	#	Standard	Measured	Allowable Range
1	0	0	0~50	4	3031	3043	2940~3122
2	518	510	468~568	5	5000	4988	4850~5150
3	1020	1030	970~1070				

CO Gas Verification — System G-101 — *Unit: ppm*

#	Standard	Measured	Allowable Range	#	Standard	Measured	Allowable Range
1	36	36	33~39	2	101	100	98~104

TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to the United States National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. TSI's calibration system is registered to ISO-9001:2015.

Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E003986	02-14-18	08-31-18
Humidity	E003539	02-22-18	08-31-18
200 CO	CC506122	01-24-18	01-25-26
Air	108551y	04-23-18	03-09-20
Flow	E004631	10-25-17	10-31-18
Flow	E003525	01-10-18	01-31-19
100 C4H8	EB0078607	09-28-16	09-28-20

Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E003987	02-14-18	08-31-18
5000 CO_2	c5732043	04-16-18	10-04-20
N_2	t78516	04-17-18	04-03-23
Flow	E003298	10-25-17	10-31-18
Flow	E003980	03-28-18	03-31-19
2000 C4H8	EB0053919	10-20-17	10-20-21

Calibrated

May 29, 2018
Date

Doc. ID: CERT_GEN_WCC

Certificate of Calibration

(✓) ~~Buck~~™ BioAire Pump Calibration Rotameter

( ) Buck™ BioSlide Pump Calibration Rotameter

Serial number: R13767

Date Calibrated: 5-29-18 **Calibration Due Date:** 5-29-19

Flow Calibration

This is to certify that the rotameter listed above has been calibrated using a Buck Primary calibrator listed below which is calibrated according to A.P. Buck, Inc. calibration procedure APB-1, Ver. 6.2 and is traceable to the National Institute of Standards & Technology (N.I.S.T). A.P. Buck guarantees the accuracy of the rotameter to be within ± 5% of the actual flow rate.

AMBIENT CONDITIONS: Temperature 74±3° F Relative Humidity 50±10%

Description	MFR.	Model	Serial #
Primary Calibrator	A.P. Buck Inc.	M30B	☐ A40020 ☑ ~~A40021~~

QA Approval By:

A.P. BUCK, INC.
7101 Presidents Drive, Suite 110
Orlando, FL 32809
Phone: 407-851-8602
Fax: 407-851-8910

BUCK
A.P. BUCK, INC.