ati INC
Architecture | Engineering | Construction

9220 Rumsey Road, Suite 100, Columbia, MD 21045
T: 410.992.3424 | F: 410.992.1837

March 2, 2021

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

RE: Indoor Air Quality Assessment, Catherine T. Reed Elementary School
Purchase Order: 734977
ATI Project Number: 20-688

Dear Mr. Baylor:

Prince George's County Public Schools requested that ATI, Inc., conduct a proactive indoor air quality (IAQ) assessment at Catherine T. Reed Elementary School on December 1, 2020 and a follow-up assessment on February 28, 2021. The assessments' key findings are enclosed in the Executive Summary on page three, and the official laboratory reports for total fungal spore trap sampling are 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.

Reviewed By:

Courtney E. McCall
Project Manager

Nate Burgei, CIH, CSP
Certified Industrial Hygienist

Indoor Air Quality Assessment Report

Prince George's County Public Schools
Catherine T. Reed Elementary School
9501 Greenbelt Road
Lanham, MD 20706

Prepared for:

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

March 2, 2021

Submitted by:

ATI Job # 20-688

Table of Contents

List of Tables

Appendices

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
Rev.	Revision

Abbreviations involving scientific volume and measurements involving media or water sampling

Spores/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

ATI conducted a proactive Indoor Air Quality (IAQ) assessment on December 1, 2020, at Catherine T. Reed Elementary School, located at 9501 Greenbelt Road, in Lanham, Maryland, and a follow-up assessment on February 28, 2021 in select rooms that had unusual results in the initial inspection.

The initial assessment on December 1, 2020 included a visual assessment of randomly selected classrooms and other frequently occupied spaces, such as the cafeteria/gym, the main office, and randomly selected classrooms, for potential IAQ contributors and pathways. Rooms 18, 27, and Kindergarten 1 had unusual fungal spore concentrations during the initial assessment and were selected for a follow-up assessment on February 28, 2021 after actions were taken to reduce the presence of mold and repair any water issues discovered. As part of both assessments, ATI measured common IAQ 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 these assessments:

1. One of the tested spaces had a temperature less than the ASHRAE recommended winter range of 68-75°F during the initial assessment. During the February reassessment, one of the three tested spaces had a temperature greater than the ASHRAE recommended winter range of 68-75°F.
2. The relative humidity in all tested spaces was less than the ASHRAE guidelines of ≤65% during the initial December assessment and the March reassessment. Some tested rooms during both assessments also had relative humidity less than 30%, which can cause occupant discomfort.
3. Carbon dioxide concentrations in all tested spaces were less than the ASHRAE limits for carbon dioxide, which were 1,097 and 1,083 parts per million (PPM) for the day of the December assessment and March reassessment, respectively.
4. Carbon monoxide concentrations were less than the IAQ meter's detection limit throughout the tested spaces.
5. The spore trap sampling results suggested that significant indoor amplification of mold was present, specifically of *Aspergillus/Penicillium*-like spores, in Room 18 and likely some level of indoor amplification in Kindergarten 1, and Room 27. Other tested spaced did not suggest noteworthy amplification.
6. The February 28, 2021 reassessment showed a favorable decrease in *Aspergillus/Penicillium*-like spores in Room 18 and Kindergarten 1, ranging from a 99% decrease to a 65% decrease, respectively. *Aspergillus/Penicillium*-like spores in Room 27 increased about 15%, suggesting the room may not have been sufficiently cleaned after treatment. ATI recommends a thorough cleaning of this room using HEPA vacuums, wet wiping all vertical and horizontal surfaces and materials, and running HEPA equipped air scrubbers for at least 24 - 48 hours.

2 Assessment Methods

Mikal Frater, Industrial Hygienist of ATI, Inc. conducted the initial visual assessment and air sampling on December 1, 2020. Sampled rooms were randomly selected and accounted for approximately 10% of classrooms or a minimum of five samples. Ms. Frater documented visual observations at the time she collected the air samples. Courtney McCall, Industrial Hygienist of ATI, conducted a follow-up inspection on February 28, 2021 in Rooms 18, 27 and Kindergarten 1 after the areas were treated for mold presence. 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 a typical adult 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 measured with a calibrated TSI Q-Trak 7575-X Meter and attached 982 Probe.

Total fungal air samples were collected with a field calibrated Buck BioAire High-Volume Sampling Pump on Zefon Air-O-Cell spore-trap cassettes at a flow rate of 15 liters per minute for a sample volume of 75 liters. EMSL Analytical, Inc. of Plymouth Meeting, PA, analyzed the initial assessment and AMA Analytical Services, Inc. of Lanham, MD analyzed the follow-up assessment samples using direct microscopic examination per ASTM D7391, which spores both viable and non-viable mold spores and particulates, which combined yields total fungal results. Both EMSL and AMA participate in the National Institute of Standards and Technology's (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) for general laboratory performance and management, and the American Industrial Hygiene Association (AIHA) for Environmental Microbial Laboratory Accreditation Program (EMLAP). The EMSL and AMA laboratory reports are included in Appendix A.

3 Visual Observations

Table 1 lists the areas, conditions, observations, and other pertinent details related to the initial and follow-up IAQ assessments. On both dates of sampling, few occupants were present in the school because of the COVID-19 global pandemic.

Table 1: Visual Observations and Sampling Locations

Sample Location	December 1, 2020 Observations
Parking Lot – Outside	• Clear skies • Light foot and vehicle traffic observed
Main Office	• Two occupants in the area during sampling • No odors, stained ceiling tiles, or visible mold growth observed • One plant hanging from ceiling, in good condition • Room splits into three adjoining office spaces • One air return in this space • Two air diffusers in this space • Trace dust accumulation in this space • Space is approximately 400 ft.^{2}
Room 18	• No odors, stained ceiling tiles, or visible mold growth observed • Ceiling tiles have been removed in an area and pipe appeared newer • Wall unit OFF during sampling • One occupant in area during sampling • Space is approximately 1,152 ft.^{2}
Room 27	• No odors, stained ceiling tiles, or visible mold growth observed • One occupant in the area during sampling • No plants in this space • Noticeably warmer in this space • One air return in this space • Four air diffusers in this space • Trace dust accumulation in this space • Space is approximately 1,258 ft.^{2}
Kindergarten 1	• One occupant in the area during sampling • Outdoor access – door closed during sampling • One wall unit OFF during sampling

Sample Location	December 1, 2020 Observations
	• Light brown ceiling tile stain by corridor entrance • Return vent to corridor directly above corridor entrance • Space is approximately 920 ft.^{2}
Room 4	• No odors, stained ceiling tiles, or visible mold growth observed • Return vent to corridor directly above corridor entrance • Wall unit ON during sampling • Trace dust accumulation in this space • One occupant in the area during sampling • Space is approximately 900 ft.^{2}

Sample Location	February 28, 2021 Reassessment Observations
Kindergarten 1	• Two occupants during sampling • Emergency exit in room with grasses and some leaves inside the door • Adjoining bathroom has ceiling tile removed and water spots present on fiberglass pipe insulation • Water cooler present in room • Student materials staged around the perimeter of the room • Floor appeared to be dusty • No water intrusion observed from active rain
Room 18	• Two occupants during sampling • Some ceiling tile debris was on the ground • Insects present on window sills • Mice/rodent droppings on filing cabinet • Emergency exit door in the room but no debris or leaves visible by door • Books and papers on coat rack in rear of room • Plastic bins in front of room with student materials • No water intrusion observed from active rain
Room 27	• One occupant present during sampling • Adjoining bathroom vent was clean but floors are dirty • Bathroom sink was dry • Cobwebs and mousetrap were present • Rodent droppings observed near rolled carpets and possibly around room's perimeter • Many boxes of student materials were pushed toward the windows making inspection along window sills difficult • Desks and shelves were dusty • No water intrusion observed from active rain
Outdoors	• Moderate rainfall during sampling • Three occupants were in the testing area under the school façade's canopy • Some shrubs and grasses were present

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 80% of 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 temperatures measured during the December 1, 2020 initial assessment and reassessment from February 28, 2021 are summarized in Table 2. As indicated by the data in the table, temperatures in the school on December 1 averaged between 67°F and 75°F, with one tested location measuring less than the ASHRAE recommended winter range.

ATI reassessed select rooms that had unusual fungal spore concentrations on February 28, 2021 after remediation actions were completed. ATI also reassessed the temperature in the reassessed rooms. The average temperatures in the reassessed locations ranged from 69°F to 76°F, with one room greater than the ASHRAE recommended winter range.

Table 2: Temperature

Sample Location	12/01/2020 Initial Assessment °F			ASHRAE Standard °F
	Min	Max	Average	
Outdoors	49	50	50	N/A
Indoors				
Main Office	66	68	67	68-75°F
Room 18	73	73	73	68-75°F
Room 27	74	75	75	68-75°F
Kindergarten 1	68	68	68	68-75°F
Room 4	69	70	70	68-75°F
2/28/2021 Reassessment Temperature in °F				
Outdoors	49	52	51	N/A
Indoors				
Kindergarten 1	68	69	69	68-75°F
Room 18	76	76	76	68-75°F
Room 27	74	75	75	68-75°F

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 less than 30% may result in drying of occupants' mucous membranes and skin. Relative humidity measurements for December 1, 2020 and February 28, 2021 are summarized in Table 3. As indicated by the data in the table, the average relative humidity ranged between 27% and 35% with all tested locations measuring less than the ASHRAE maximum recommendation of 65% relative humidity, and three tested locations also measuring less than 30% relative humidity.

ATI reassessed select rooms that had unusual fungal spore concentrations on December 1, 2020, after remediation actions were completed. ATI also reassessed the relative humidity in the space on February 28, 2021 and the average relative humidity ranged between 33% and 40% with all of the tested locations measuring less than the ASHRAE maximum recommendation of 65%, but greater than 30% relative humidity, which is optimal.

Table 3: Relative Humidity

Sample Location	12/01/2020 Initial Assessment (% RH)			ASHRAE Standard (% RH)
	Min	Max	Average	
Outdoors	36	48	42	N/A
Indoors				
Main Office	33	36	35	≤ 65
Room 18	26	29	28	≤ 65
Room 27	26	27	27	≤ 65
Kindergarten 1	29	29	29	≤ 65
Room 4	30	31	31	≤ 65
2/28/21 Reassessment Relative Humidity (%RH)				
Outdoors	62	71	67	N/A
Indoors				
Kindergarten 1	39	40	40	≤ 65
Room 18	32	33	33	≤ 65
Room 27	33	33	33	≤ 65

4.3 Carbon Dioxide

Carbon dioxide concentrations 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 can maintain indoor carbon dioxide concentrations less than 700 parts per million (ppm) greater than the outdoor air concentration. Typically, outdoor carbon dioxide concentrations range from 300 ppm to 450 ppm, with the higher range typically found in urban areas during peak rush hour.

Carbon dioxide concentrations for December 1, 2020 are summarized in Table 4. On the day of the assessment, the average outdoor carbon dioxide concentration was 397 ppm, which calculates to a maximum indoor concentration of 1,097 ppm (700 + 397). All tested locations indoors were less than the recommended maximum for the day of the assessment.

ATI reassessed select rooms that had unusual fungal spore concentrations on December 1, 2020, after remediation actions were completed. The carbon dioxide concentrations measured during the reassessment are included in Table 4. The average outdoor carbon dioxide concentration on February 28, 2021 was 383 ppm, which calculates to a maximum indoor concentration of 1,083 ppm (700 + 383). All tested locations indoors were less than the recommended maximum for the day of the reassessment.

Table 4: Carbon Dioxide

Sample Location	12/01/2020 Concentration (parts per million)			ASHRAE Standard (ppm) NTE
	Min	Max	Average	
Outdoors	393	401	397	N/A
Indoors				
Main Office	393	409	401	< 1,097
Room 18	394	394	394	< 1,097
Room 27	416	424	420	< 1,097
Kindergarten 1	426	438	432	< 1,097
Room 4	377	389	383	< 1,097
2/28/21 Reassessment Concentration (parts per million)				
Outdoors	376	390	383	N/A
Indoors				
Kindergarten 1	431	445	483	< 1,083
Room 18	490	515	503	< 1,083
Room 27	482	491	487	< 1,083

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 over an eight-hour time-weighted average. ATI measured carbon monoxide concentrations using a TSI Q-Trak model number 7575-X with an attached IAQ probe (model number 982). The instrument's carbon monoxide sensor has an error range of ± 3% of the reading or three (3) ppm, whichever is greater. As indicated by the data in Table 5, carbon monoxide concentrations for December 1, 2020 were less than the Q-Trak's detection limit throughout the school.

ATI reassessed select rooms that had unusual fungal spore concentrations on December 1, 2020, after remediation actions were completed. The carbon monoxide concentrations measured during the reassessment are included in Table 5. The carbon monoxide concentrations from the reassessment on February 28, 2021 were also less than the Q-Trak's limit of detection and less than the EPA/ASHRAE recommended maximum of 9 ppm.

Table 5: Carbon Monoxide

Sample Location	12/01/2020 Concentration (parts per million)			ASHRAE Standard (ppm)
	Min	Max	Average	
Outdoors	< 3	< 3	< 3	N/A
Indoors				
Main Office	< 3	< 3	< 3	< 9
Cafeteria	< 3	< 3	< 3	< 9
Room 401	< 3	< 3	< 3	< 9
Room 710	< 3	< 3	< 3	< 9
Media Center	< 3	< 3	< 3	< 9
Room 701	< 3	< 3	< 3	< 9
Room 102	< 3	< 3	< 3	< 9

2/28/2021 Reassessment Concentration (parts per million)				
Outdoors	< 3	< 3	< 3	N/A
Indoors				
Kindergarten 1	< 3	< 3	< 3	< 9
Room 18	< 3	< 3	< 3	< 9
Room 27	< 3	< 3	< 3	< 9

5 Total Fungal Air Sampling Results

Mold is carried indoors through building entrances, open windows, loading docks, foot traffic into buildings, and the HVAC system. To thrive indoors, mold requires a food source, proper temperature and humidity to foster its growth.

The December 1, 2020 and February 28, 2021 mold assessments 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 results from December 1, 2020 suggested unusual mold spore concentrations in three locations: Rooms 18, 27, and Kindergarten 1. The total ambient, outdoor spore concentration was 936 spores/m^3. Room 18 had the greatest total spore concentration of 103,200 spores/m^3, with *Aspergillus/Penicillium*-like spores being the predominant spores present at 103,000 spores/m^3. Rooms 27 and Kindergarten 1 had total spore concentrations of 2,740 and 1,320 spores/m^3, respectively, with *Aspergillus/Penicillium*-like spores being the predominant spores present at 2,700 and 1,200 spores/m^3, respectively.

The fungal spore concentrations Rooms 27 and Kindergarten 1 are just slightly greater than typical indoor mold concentrations of around 1,000 spores/m^3 or less; however, the concentrations measured in those rooms do not suggest significant mold growth and could be residual spores from prior growth, contamination from other affected areas, or possibly trivial amounts of mold growth normal in occupied spaces. The fungal spore concentrations in Rooms 18 were greater than the typical occupied space and suggest moderate to significant mold amplification indoors. The spore trap method of sampling, which analyzed for both viable and non-viable mold, is unable to differentiate from currently active mold growth and residual mold spores remaining from prior mold growth and water issues. Based on the observations in Room 18 on December 1, 2020, of leaky pipes above the drop ceiling, it is feasible some of this concentration could have been from the active leaks. ATI recommended evaluating these tested spaces and the surrounding areas to try and identify water sources, abate any mold issues and clean the area before retesting the space.

Kindergarten 1 and Rooms 18 and 27 were reassessed on February 28, 2021 after the initial assessment indicated the unusual presence of airborne mold spores. The *Aspergillus/Penicillium*-like spores decreased in Room 18 by 99% and in Kindergarten 1 by 65% and *Aspergillus/Penicillium*-like spore concentrations in both rooms fell to less than 1,000 spores/m^3. At the initial assessment, Room 27 had a *Aspergillus/Penicillium*-like spore concentration of 1,200 spores/m^3, which by the February resampling event increased to 3,172 spores/m^3. ATI observed dust on desks and shelves on the room's surfaces, cobwebs, as well as rodent droppings. Dirt load was present on air supplies in the room. These observations suggest that the space was not sufficiently cleaned after the room was treated and the residual mold spores remained. The treatment activities may have disturbed some of the settled dust and increased the airborne concentration. ATI recommends further evaluating Room 27 and

the surrounding areas for potential water problems, along with HEPA vacuuming all surfaces, wet-wiping all horizontal and vertical surfaces and, if possible, running a HEPA equipped air scrubber for at least 24 to 48-hours.

Differences in concentrations between both dates of assessment are summarized in Table 6.

Table 6: *Aspergillus/Penicillium* Concentration Comparison

Sample Location	December 1, 2020 Concentrations	February 28, 2021 Concentrations	% Change
Room 18	103,000	364	-99%
Room 27	2,700	3,172	+17%
Kindergarten 1	1,200	416	-65%

The official laboratory reports with spore trap samples collected on December 1, 2020 and February 28, 2021 are presented in Appendix A.

6 Summary of Findings

1. One of the tested spaces had a temperature less than the ASHRAE recommended winter range of 68-75°F during the initial assessment. During the February reassessment, one of the three tested spaces had a temperature greater than the ASHRAE recommended winter range of 68-75°F.
2. The relative humidity in all tested spaces was less than the ASHRAE guidelines of ≤65% during the initial December assessment and the March reassessment. Some tested rooms during both assessments also had relative humidity less than 30%, which can cause occupant discomfort.
3. Carbon dioxide concentrations in all tested spaces were less than the ASHRAE limits for carbon dioxide, which were 1,097 and 1,083 parts per million (PPM) for the day of the December assessment and March reassessment, respectively.
4. Carbon monoxide concentrations were less than the IAQ meter's detection limit throughout the tested spaces.
5. The spore trap sampling results suggested that significant indoor amplification of mold was present, specifically of *Aspergillus/Penicillium*-like spores, in Room 18 and likely some level of indoor amplification in Kindergarten 1, and Room 27. Other tested spaced did not suggest noteworthy amplification.
6. The February 28, 2021 reassessment showed a favorable decrease in *Aspergillus/Penicillium*-like spores in Room 18 and Kindergarten 1, ranging from a 99% decrease to a 65% decrease, respectively. *Aspergillus/Penicillium*-like spores in Room 27 increased about 15%, suggesting the room may not have been sufficiently cleaned after treatment. ATI recommends a thorough cleaning of this room using HEPA vacuums, wet wiping all vertical and horizontal surfaces and materials, and running HEPA equipped air scrubbers for at least 24 - 48 hours.

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

Best,
ATI, INC.

Courtney E. McCall
Project Manager

Nate Burgei, CIH, CSP
Certified Industrial Hygienist

Appendix A: Laboratory Report and Chain of Custody

EMSL Analytical, Inc.

5221 Militia Hill Road Plymouth Meeting, PA 19462

Tel/Fax: (610) 828-3102 / (610) 828-3122

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

EMSL Order: 182003868
Customer ID: ATII25A
Customer PO:
Project ID:

Attention: Mikal Frater
ATI
4221 Forbes Blvd
Suite 250
Lanham, MD 20706
Project: PGCPS - Catherine Reed ES.

Phone: (202) 832-1433
Fax:
Collected Date: 12/01/2020
Received Date: 12/01/2020 11:47 AM
Analyzed Date: 12/07/2020

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

Lab Sample Number:	182003868-0001			182003868-0002			182003868-0003		
Client Sample ID:	20-688-1			20-688-2			20-688-3		
Volume (L):	75						75		
Sample Location:	Outside Parking Lot			Field Blanbk			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	-	-	-	-	-	-	1	40	8.3
Aspergillus/Penicillium	4	200	8.3	-	-	-	3	100	20.8
Basidiospores	53	2200	91.3	-	-	-	8	300	62.5
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	1	40	8.3
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1*	10*	0.4	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**58**	**2410**	**100**	**-**	**No Trace**	**-**	**13**	**480**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	1*	10*	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	42	-	-	0	-	-	42	-
Analyt. Sensitivity 300x	-	13*	-	-	0*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	-	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	-	-	-	1	-
Background (1-5)	-	1	-	-	-	-	-	1	-

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

Kevin Ream, Laboratory Manager
or other Approved Signatory

Initial report from: 12/07/2020 10:11 AM

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

EMSL Analytical, Inc.

5221 Militia Hill Road Plymouth Meeting, PA 19462

Tel/Fax: (610) 828-3102 / (610) 828-3122

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

EMSL Order: 182003868
Customer ID: ATII25A
Customer PO:
Project ID:

Attention: Mikal Frater
ATI
4221 Forbes Blvd
Suite 250
Lanham, MD 20706
Project: PGCPS - Catherine Reed ES.

Phone: (202) 832-1433
Fax:
Collected Date: 12/01/2020
Received Date: 12/01/2020 11:47 AM
Analyzed Date: 12/07/2020

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

Lab Sample Number:	182003868-0004			182003868-0005			182003868-0006		
Client Sample ID:	20-688-4			20-688-5			20-688-6		
Volume (L):	75			75			75		
Sample Location:	Room 18			Room 27			Kindergarten 1		
Spore Types	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	1	40	3
Aspergillus/Penicillium	2440	103000	99.8	64	2700	98.5	28	1200	90.9
Basidiospores	5	200	0.2	1	40	1.5	1	40	3
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	1	40	3
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**2445**	**103200**	**100**	**65**	**2740**	**100**	**31**	**1320**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	42	-	-	42	-	-	42	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

182003868-0004 - Aspergillus conidiophores present in sample.

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

Kevin Ream, Laboratory Manager
or other Approved Signatory

Initial report from: 12/07/2020 10:11 AM

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

EMSL Analytical, Inc.

5221 Militia Hill Road Plymouth Meeting, PA 19462

Tel/Fax: (610) 828-3102 / (610) 828-3122

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

EMSL Order: 182003868
Customer ID: ATII25A
Customer PO:
Project ID:

Attention: Mikal Frater
ATI
4221 Forbes Blvd
Suite 250
Lanham, MD 20706
Project: PGCPS - Catherine Reed ES.

Phone: (202) 832-1433
Fax:
Collected Date: 12/01/2020
Received Date: 12/01/2020 11:47 AM
Analyzed Date: 12/07/2020

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

Lab Sample Number:	**182003868-0007**		
Client Sample ID:	**20-688-7**		
Volume (L):	**75**		
Sample Location:	**Room 4**		
Spore Types	**Raw Count**	**Count/M³**	**% of Total**
Alternaria (Ulocladium)	-	-	-
Ascospores	-	-	-
Aspergillus/Penicillium	4	200	71.4
Basidiospores	-	-	-
Bipolaris++	-	-	-
Chaetomium	-	-	-
Cladosporium	2	80	28.6
Curvularia	-	-	-
Epicoccum	-	-	-
Fusarium	-	-	-
Ganoderma	-	-	-
Myxomycetes++	-	-	-
Pithomyces++	-	-	-
Rust	-	-	-
Scopulariopsis/Microascus	-	-	-
Stachybotrys/Memnoniella	-	-	-
Unidentifiable Spores	-	-	-
Zygomycetes	-	-	-
Total Fungi	**6**	**280**	**100**
Hyphal Fragment	-	-	-
Insect Fragment	-	-	-
Pollen	-	-	-
Analyt. Sensitivity 600x	-	42	-
Analyt. Sensitivity 300x	-	13*	-
Skin Fragments (1-4)	-	1	-
Fibrous Particulate (1-4)	-	1	-
Background (1-5)	-	1	-

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

Kevin Ream, Laboratory Manager
or other Approved Signatory

Initial report from: 12/07/2020 10:11 AM

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

OrderID: 182003868

EMSL ANALYTICAL, INC.

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*): [redacted]

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): Mikal Frater	**Telephone #:** 202-558-7489
Email Address: Mikal@atiinc.com	**Fax #:** **Purchase Order:**
Project Name/Number: PGCPS - Catherine Reed 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
M030 Micro 5
M174 MoldSnap
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:** MikalFrater

Sample #	Sample Location/Description	Sample Type	Potable/ NonPotable (Only for Waters)	Test Code	Volume/ Area	Date/Time Collected
[redacted]						
20-688 1	Outside Parking Lot	Air	☐ P ☐ NP	M001	75L	12/1/20
20-688 2	Field Blank	Air	☐ P ☐ NP	M001	75L	—
20-688 3	Main Office	Air	☐ P ☐ NP	M001	75L	10:1[illegible]
20-688 4	Room 18	Air	☐ P ☐ NP	M001	75L	10:30
20-688 5	Room 27	Air	☐ P ☐ NP	M001	75L	10:4[illegible]

Client Sample # (s): - 7 **Total # of Samples:** 7

Relinquished (Client): **Date:** 12/1/20 **Time:** 11:40 PM

Received (Lab): L. Ellsworth Drop Box **Date:** **Time:**

Comments/Special Instructions:

RECEIVED
EMSL ANALYTICAL, INC
BELTVILLE, MD
2020 DEC -1 A 11:4[illegible]

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

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Microbiology Chain of Custody

EMSL Order Number *(Lab Use Only)*:

182003868

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	[redacted]
20-688 6	Kindergarten I	Air	☐ P ☐ NP	M001	75L	12/1 10:55	
20-688 7	Room 4	Air	☐ P ☐ NP	M001	75L	12/1 11:02	
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				

Comments/Special Instructions:

Page 2 of 2

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

GEN-FM-10-1: Sample Transfer-One Time
Revision 4.2
Revision Date: 1/05/2016
Effective Date: 1/05/2016

182003868

EMSL Analytical, Inc.

Sample Transfer Form

Receiving Lab:	EMSL- BELTSVILLE	**Phone Number:**	3019375700
		Fax Number:	3019375701
Relinquished to:	EMSL- Plymouth Mtg.	**Phone Number:**	8002203675
		Fax Number:	8567860262
Does new lab hold equivalent or additional accreditation? *		☒ Yes ☐ No	

EMSL Customer ID # (if known):	ATII25A
Client Name:	ATI INC
Client Project:	PGCPS - CATHERINE REED ES
Tests to be Performed:	M001
Date Received:	12/1/20
Date Relinquished:	12/2/20
Date Due:	1 WEEK - 12/8/20 @ 11:47 AM
Special Instructions: (e.g. Work Order # , required qualifications, project specific procedures/modifications)	

Relinquished by (Signature):	**Date:**	**Received by (Signature):**	**Date:**
L. Plymouth	12/2/20		12.3.20
Relinquished by (Signature):	**Date:**	**Received by (Signature):**	**Date:**

Customer Agreement- Please sign form and send to the receiving laboratory. By signing below, you agree to permit the above named receiving lab to transfer samples to a separate EMSL lab with equivalent qualifications* for analysis. The final report will be issued from the analyzing laboratory. Ensure any requirements are listed in special instructions.

Name (please print):	**Signature:**	**Agent of:**	**Date:**

If this is a recurring project or sample type that may require samples to be relinquished on a regular basis, a Standing Agreement form must be completed.

* Receiving and analyzing labs shall be aware of required qualifications of project prior to transfer of samples.

Note: If customer has been notified and approved this transfer verbally or by e-mail, the receiving lab must sign for the customer above. EMSL employee filling out form on behalf of customer shall print name of person to whom they spoke, date agreement was received, and then sign under Signature.

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	625388	**Job Name:**	Catherine Reed Elementary	**Date Submitted:**	03/01/2021
Client:	ATI, Inc.	**Job Location:**	9501 Greenbelt Road, Lanham, MD 20706	**Person Submitting:**	Courtney McCall
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-988	**Date Analyzed:**	03/01/2021
		P.O. Number:	Not Provided	**Report Date:**	03/01/2021
Attention:	Courtney McCall				

AMA Sample #	625388-1	**AMA Sample #**	625388-2	**AMA Sample #**	625388-3
Client ID	31569730	**Client ID**	31569743	**Client ID**	31569746
Analyst ID	MG	**Analyst ID**	MG	**Analyst ID**	MG
Collection Apparatus	Air-O-Cell	**Collection Apparatus**	Air-O-Cell	**Collection Apparatus**	Air-O-Cell
Sample Volume (L)	75	**Sample Volume (L)**	75	**Sample Volume (L)**	75
Sample Condition	Acceptable	**Sample Condition**	Acceptable	**Sample Condition**	Acceptable
Debris Loading	1	**Debris Loading**	1	**Debris Loading**	1
Location	Ambient	**Location**	Room 18	**Location**	Room 27

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	102	15	80	8160	52.3%
Basidiospores	85	23	52	4420	43.6%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	1	23	52	52	0.5%
Curvularia					
Penicillium / Aspergillus	5	23	52	260	2.6%
Smuts/Periconia/Myxomycetes	2	23	52	104	1%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	195	**Total sp/m³:**		12996	

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	7	23	52	364	16.3%
Basidiospores	25	23	52	1300	58.1%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	4	23	52	208	9.3%
Curvularia					
Penicillium / Aspergillus	7	23	52	364	16.3%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	43	**Total sp/m³:**		2236	

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	6	23	52	312	7.6%
Basidiospores	8	23	52	416	10.1%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	3	23	52	156	3.8%
Curvularia					
Penicillium / Aspergillus	61	23	52	3172	77.2%
Smuts/Periconia/Myxomycetes	1	23	52	52	1.3%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	79	**Total sp/m³:**		4108	

Comments

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody: 625388
Client: ATI, Inc.
Address: 9220 Rumsey Road
Suite 100
Columbia, MD 21045
Attention: Courtney McCall

Job Name: Catherine Reed Elementary
Job Location: 9501 Greenbelt Road, Lanham, MD 20706
Job Number: 20-988
P.O. Number: Not Provided

Date Submitted: 03/01/2021
Person Submitting: Courtney McCall
Date Analyzed: 03/01/2021
Report Date: 03/01/2021

AMA Sample #	625388-4
Client ID	31569736
Analyst ID	MG
Collection Apparatus	Air-O-Cell
Sample Volume (L)	75
Sample Condition	Acceptable
Debris Loading	1
Location	Kinder 1

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores	5	23	52	260	27.8%
Basidiospores	4	23	52	208	22.2%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	1	23	52	52	5.6%
Curvularia					
Penicillium / Aspergillus	8	23	52	416	44.4%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					

Total Raw Ct: 18 **Total sp/m^3:** 936

Comments

AMA Sample #	625388-5
Client ID	31569745
Analyst ID	MG
Collection Apparatus	Air-O-Cell
Sample Volume (L)	0
Sample Condition	Acceptable
Debris Loading	0
Location	Blank

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores					
Basidiospores					
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus					
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					

Total Raw Ct: 0 **Total sp/m^3:** 0

Comments

No mold spores observed.

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	625388	**Job Name:**	Catherine Reed Elementary	**Date Submitted:**	03/01/2021
Client:	ATI, Inc.	**Job Location:**	9501 Greenbelt Road, Lanham, MD 20706	**Person Submitting:**	Courtney McCall
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-988	**Date Analyzed:**	03/01/2021
		P.O. Number:	Not Provided	**Report Date:**	03/01/2021
Attention:	Courtney McCall				

Spore Comparison Guide

The criteria for these specifications are outlined, but not limited to those listed, below. Final specifications may differ from the listed criteria for certain samples. AMA Analytical Services, Inc. reserves the right to make changes to these criteria at any time without notice.

Normal ecology	Slightly above normal ecology	Moderately above normal ecology	Substantially above normal ecology

Stachybotrys / Memnoniella, and Chaetomium	**Other Spores* (Control Present)**	**Other Spores* (No Control)**
1-4 Spores: Yellow 5-9 Spores: Orange 10+ Spores: Red	< 10 Spores: Insignificant (no color) <= Control's spore count: Green Between Control and 2x Control: Yellow Between 2x Control and 3x Control: Orange 3x+ Control: Red	< 10 Spores: Insignificant (no color) 10-20 Spores: Yellow 20-50 Spores: Orange 50+ Spores: Red

*No evalutation is provided for the following spore types: Other, Other Colorless, and Unknown Fungi, and Misc

Interpretation of the data contained in this report is the sole responsibility of the client or the persons who conducted the field work. There are no federal or national standards for the number of fungal spores that may be present in the indoor environment. As a general rule and guideline that is widely accepted in the indoor air quality field, the numbers and types of spores that are present in the indoor environment should be comparable to those that are present outdoors at any given time. There will always be some mold spores present in "Normal" indoor environments. The purpose of sampling and counting spores is to help determine whether an abnormal condition exists within the indoor environment and if it does, to help pinpoint the area of contamination. Spore counts should not be used as the sole determining factor of mold contamination. There are many factors that can cause anomalies in the comparison of indoor and outdoor samples due to the dynamic nature of both of those environments.

This report is provided for informational and comparative purposes only and should not be relied upon for any other purpose. Sampling techniques, possible contaminants, unrepresentative samples and other similar or dissimilar factors may affect these results. With the statistical evaluation provided, as with all statistical comparisons and analyses, false-positive and false-negative results can and do occur. AMA Analytical Services, Inc. hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken or omitted in reliance upon, this report.

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	625388	**Job Name:**	Catherine Reed Elementary	**Date Submitted:**	03/01/2021
Client:	ATI, Inc.	**Job Location:**	9501 Greenbelt Road, Lanham, MD 20706	**Person Submitting:**	Courtney McCall
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-988	**Date Analyzed:**	03/01/2021
		P.O. Number:	Not Provided	**Report Date:**	03/01/2021
Attention:	Courtney McCall				

General Comments, Disclaimers, and Footnotes

Analytical Method: Sample are analyzed following the instructions and guidelines outlined in ASTM 7391-09.

Sample Condition: Acceptable: The sample was collected and delivered to the our location without disturbing the material on the sampling media.
Unacceptable: 1. The sample trace (TR) has been disturbed. 2. The sample was damaged or otherwise unsuitable for analysis.
0 = No particulate matter detected; 1= >nd-~5% Particulate Loading; 2 = ~5%-25% Particulate Loading; 3 = ~25%- 75% Particulate Loading; 4 = ~75%-90% Particulate Loading; 5 = >90% Particulate Loading

Spore Notes: Based on their small size and very few distinguishing characteristics, Aspergillus and Penicillium cannot be differentiated by non-viable sampling methods. There are other types of spores whose morphology is similar to Aspergillus and Penicillium and cannot be differentiated by non-viable sampling methods. Examples of these similar spores are Acremonium, Paecilomyces, Wallemia, Trichoderma, Scopulariopsis, and Gliocladium.
Smuts, Periconia and Myxomycetes are three different types of genera that have similar morphological characteristics.
Bipolaris/Dreschlera/Helm: Bipolaris / Dreschlera / Helminthosporium are three different types of genera that have smiliar morphological characteristics.
Other Colorless represents all colorless spores that are non-distinctive and unidentifiable.
*Hyphal Fragments: A portion of the mycelium that becomes separated from the remainder of the thallus (vegetative body), each of which has the capacity to grow and form new individuals. Results for hyphal fragments are in fragments/m3 and are not incorporated in the total spore concentration.
The droplet symbol (💧) refers to water-intrusion indicator spores. These fungal spores, when found on indoor air samples, can be an indication of moisture sources and resultant fungal growth that may be problematic.

Quantification: Analytical Sensitivity (A.S.): This is dependent on the volume of air collected, size of the trace, ocular diameter, and the amount of the trace that was analyzed.
The value of "Present" indicated in the Raw Count column represents the presence of this spore type during the preliminary exam at 400x. The Raw Count converts to a whole number if the spore type is encountered again during the 600x-1,000x enumeration. The sp/m3concentration will be reported as less than the analytical sensitivity if "Present" is reported in the Raw Count.
Results are reported to 3 significant figures. sp/m3: Spores per cubic meter.
Uncertainty: for raw count in the range of 0-50 the SR is 0.375, 51-100 SR=0.333, 101-200 SR=0.257, >200 SR=0.245
All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.
Analyst(s): Michael Greenberg

Technical Director Tristan Ward

MOLD SPORE DESCRIPTIONS

Ascospores

Ascospores are spores formed inside an ascus (asci-plural) or sac-like cell which is contained inside a fruiting body called an ascocarp or an ascoma (ascomata-plural). An ascus typically contains a definite nuimber of ascospores, usually eight. Ascospores are unique in shape, size, and color as to the Genus/species they represent. These spores are specific to fungi classified as Ascomycetes. They are ubiquitous in nature. Many decay organic matter, others are plant or animal pathogens. They can grow indoors on damp materials. Release of ascospores are released by forcible ejection and dispersed by wind, water, animals and other agents. Health Effects: Depending on the Genera, Ascospores may be allergenic.

Basidiospores

Basidiospores are reproductive spores produced by a group of fungi called basidiomycetes. This group includes the mushrooms, shelf fungi and various other macrofungi. Basidipspores serve as the main air (wind) dispersal units for the fungi and their release is dependent upon moisture. The structure of the spore complex can develop in various manners resulting in different appearances. It is often found growing in soil, decaying plant debris, compost piles and fruit rot. Indoors, it can be found on water damaged building materials (chipboard /OSB, plywood, wallpaper, and glue) as well as on food items (dried foods, cheeses, fruits, herbs, spices, cereals). Health effects: Some basidiospores may produce toxins and can act as allergens. They have not been reported to be pathogens.

Cladosporium

Cladosporium is the most common indoor and outdoor mold. The spores are wind dispersed and are often extremely abundant in outdoor air. Many species are commonly found on living and dead plant material. Indoors, they may grow on surfaces with high moisture or high humidity levels such as damp window sills, poorly ventilated bathrooms and soiled refrigerators. It produces powdery or velvety olive-green to brown or black colonies. The conidia (spores) vary depending on the species and are formed in simple or branching chains with multi-attachment points. Health Effects: Cladosporium species are rarely pathogenic to humans, but have been reported to occassionally cause sinusitis and pulmonary infections as well as infections of the skin and toenails. The airborne spores are significant allergens, and in large amounts they may severely affect asthmatics and people with respiratory diseases.

Penicillium/Aspergillus Like

Penicillium and Aspergillus are ubiquitous, filamentous fungi that are found in soil, decaying plant debris, compost piles, and in the air. Indoors, spores are commonly found in house dust, in water-damaged buildings (wallpaper, wallpaper glue, decaying fabrics, moist chipboards, and behind paint) as well as fruit and grains. They are the most common fungal genera, worldwide. Both produce chains of spores that are small, round to oval, colorless or slightly pigmented, and smooth to rough walled. These spores are indistinguishable between the two as well as other genera, such as Gliocladium, Trichoderma, Paecilomyces, and Scopulariopsis. They differ as to their conidiophores or fruiting bodies. While, Aspergillus spores are produced from phialides supported on conidia heads or swollen vesicles, Penicillium spores are produced on finger-like projections. Depending on species, typical colonies of Aspergillus are initially white and later turn to either shades of green, yellow, orange, brown or black. Texture is usually velvety to cottony. Typical colonies of Penicillium, other than Penicillium marneffei (yeast-like at 37oC), grow rapidly, white in color at first, later becoming bluish green with white borders with velvety to powdery textures depending on species. Some species produce radial patterns. Health Effects: Both Aspergillus and Penicillium are potential allergens. Several species of Aspergillus (A. flavus and A. parasiticus) produce aflatoxins or natually occurring mycotoxins that are toxic and carcinogenic. These are found in contaminated foodstuff and are hazardous to consumers. Penicillium has only one known species that is pathogenic to humans (P. marneffei) that causes lethal systemic infection (Penicilliosis) in immunocompromised individuals.

Smuts/Periconia/Myxomycetes

Smuts, Periconia, and Myxomycetes spores are grouped together due to their similar round, brown morphology. Smuts are outdoor parasitic plant pathogens. They rarely grow indoors but may grow on host plants if appropriate conditions are present. They are parasitic plant pathogens. They can be found on cereal crops, grasses, flowing plants, weed, and other fungi. They can cause allergies. Periconia are found in soils, dead herbaceous stems and leaf spots, and grasses. They have wind dispersed dry spores. Their spores are abundant in the air but it is not known if they are allergenic. Myxomycetes are found on decaying logs, stumps and dead leaves. They have wind-dispersed dry spores and wet motile (amoebic phase) spores. During favorable conditions they move about like amoebae. They form dry airborne spores when conditions are unfavorable. They are rarely found indoors. Health Effects: They may cause Type 1 allergies (hay fever, asthma). No human infections have been reported.

MINUTEMAN PRESS 410-590-5555 431417

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA-LAP (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

* PRIORITY ! *

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 025388

Mailing/Billing Information:
1. Client Name: ATI Inc.
2. Address 1: 4221 Forbes Blvd
3. Address 2: Suite 250
4. Address 3: Lanham, MD 20706
5. Phone #: _____ Fax #: _____

Submittal Information:
1. Job Name: Catherine Reed Elementary
2. Job Location: 9501 Greenbelt Rd, Lanham, MD 20706
3. Job #: 20-688 P.O. #: _____
4. Contact Person: Courtney McCall Cell: 703 399 5423
5. Collected by: Courtney McCall Cell: _____

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email to contacts on file.

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ 4 Hours ❑ Late Night ❑ Immediate Date Due: _____ ❑ 24 Hours Time Due: _____ Comments: _____	❑ 4 Hours ❑ 3 Day ❑ Same Day ❑ 5 Day + ☑ Next Day Date Due: 3/2/21 ❑ 2 Day ❑ ~~Results Required By Noon~~ (Additional fee may apply) Hard Deadline	☑ Email: courtney@atiinc.com ❑ Email 2: _____ ❑ Verbals: _____

Asbestos Analysis
*PCM Air – Please Indicate Filter Type: _____
❑ NIOSH 7400 _____ (QTY)
❑ Fiberglass _____ (QTY)
TEM Air* – Please Indicate Filter Type: _____
❑ AHERA _____ (QTY)
❑ NIOSH 7402 _____ (QTY)
❑ Other (specify _____) _____ (QTY)
PLM Bulk
❑ EPA 600 – Visual Estimate _____ (QTY) ❑ Pos Stop
❑ EPA Point Count _____ (QTY)
❑ NY State Friable 198.1 _____ (QTY)
❑ Grav. Reduction ELAP 198.6 _____ (QTY)
❑ Other (specify _____) _____ (QTY)
MISC
❑ Asbestos Soil ASTM D7521 PLM ____ (Qual) PLM ____ (Quan) PLM/TEM ____ (Qual) PLM/TEM ____ (Quan)
*It is recommended that blank samples be submitted with all air and surface samples

TEM Bulk
❑ ELAP 198.4/Chatfield _____ (QTY)
❑ NY State PLM/TEM _____ (QTY)
❑ Residual Ash _____ (QTY)
❑ Vermiculite _____ (QTY)
TEM Dust*
❑ Qual. (pres/abs) Vacuum/Dust _____ (QTY)
❑ Quan. (s/area) Vacuum D5755-95 _____ (QTY)
❑ Quan. (s/area)Dust D6480-99 _____ (QTY)
TEM Water
❑ Qual. (pres/abs) _____ (QTY)
❑ ELAP 198.2/EPA 100.2 _____ (QTY)
❑ EPA 100.1 _____ (QTY)

All samples received in good condition unless otherwise noted.
Lab use only (TEM Water samples _____°C)
If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
❑ Pb Paint Chip ❑ % by Weight ____ (QTY) ❑ mg/cm² ____ (QTY)
❑ *Pb Dust Wipe (wipe type _____) _____ (QTY)
❑ *Pb Air _____ (QTY)
❑ Pb Soil/Solid _____ (QTY)
❑ Pb TCLP _____ (QTY)
❑ Drinking Water ❑ Pb ____ (QTY) ❑ Cu ____ (QTY)
❑ Waste Water ❑ Pb ____ (QTY) ❑ Cu ____ (QTY)
❑ Pb Furnace (Media _____) _____ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: _____
Collection Media: _____
☑ *Spore-Trap 5 (QTY) ❑ Surface Vacuum Dust ____ (QTY)
❑ *Surface Swab ____ (QTY)
❑ *Surface Tape ____ (QTY)
❑ Other (Specify ____) ____ (QTY)

SAMPLE INFORMATION CLIENT ID #	SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	MATRIX: BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	COMMENTS / SPECIAL INSTRUCTIONS
3156 9730	Ambient	2/28/21 1101	75L					✓	✓				✓			
3156 9748	Room 18	2/28/21 1030	75L					✓	✓				✓			
3156 9746	Room 27	2/28/21 1045	75L					✓	✓				✓			
3156 9736	Kinder 1	2/28/21 1019	75L					✓	✓				✓			
3156 9745	F Blank	—	—					✓	✓				✓			

	Print Name	Signature	Date	Time	Shipping Information
Relinquished by:	Courtney McCall	Courtney McCall	2/28/21	1127 AM	❑ UPS ❑ In-Person ❑ Other ❑ FedEx ~~❑ Drop Box~~ ❑ USPS ❑ Courier
Received by:			3/1/21	0800	

Note:
Could this set be priority & first set to be analyzed?

Appendix B: Instrument Calibration Records

Certificate of Calibration

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

Serial number: R15042
Date Calibrated: 11/12/2020 **Calibration Due Date:** 11/12/2021

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: Moroni Menk

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

BUCK

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	71.33 (21.9)	°F (°C)
RELATIVE HUMIDITY	53.9	%RH
BAROMETRIC PRESSURE	28.81 (975.6)	inHg (hPa)

MODEL	7575-X
SERIAL NUMBER	7575X1711004

☒ AS LEFT ☐ AS FOUND

☒ IN TOLERANCE ☐ OUT OF TOLERANCE

– CALIBRATION VERIFICATION RESULTS –

THERMO COUPLE — SYSTEM PRESSURE01-02 — *Unit: °F (°C)*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	70.9 (21.6)	71.1 (21.7)	68.9~72.9 (20.5~22.7)				

BAROMETRIC PRESSURE — SYSTEM PRESSURE01-02 — *Unit: inHg (hPa)*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	28.82 (976.0)	28.82 (976.0)	28.24~29.40 (956.3~995.6)				

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	Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E004626	02-14-20	02-28-21	Pressure	E005254	10-10-19	10-31-20
Pressure	E003982	07-21-20	01-31-21	DC Voltage	E003493	06-17-20	06-30-21

CALIBRATED

August 31, 2020
DATE

Doc. ID: CERT_GEN_WCC

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	71.24 (21.8)	°F (°C)
RELATIVE HUMIDITY	54.8	%RH
BAROMETRIC PRESSURE	28.74 (973.2)	inHg (hPa)

MODEL	7575-X
SERIAL NUMBER	7575X1711004

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

– CALIBRATION VERIFICATION RESULTS –

THERMO COUPLE — **SYSTEM PRESSURE01-02** — *Unit: °F (°C)*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	70.8 (21.6)	70.5 (21.4)	68.8~72.8 (20.4~22.7)				

BAROMETRIC PRESSURE — **SYSTEM PRESSURE01-02** — *Unit: inHg (hPa)*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	28.75 (973.6)	28.84 (976.6)	28.17~29.33 (953.9~993.2)				

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	Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E004626	02-14-20	02-28-21	Pressure	E005254	10-10-19	10-31-20
Pressure	E003982	07-21-20	01-31-21	DC Voltage	E003493	06-17-20	06-30-21

VERIFIED

August 31, 2020
DATE

Doc. ID: CERT_GEN_WCC

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	75.8 (24.3)	°F (°C)
RELATIVE HUMIDITY	48	%RH
BAROMETRIC PRESSURE	28.72 (972.6)	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	3020.5	* 2874.5	2929.9~3111.1
2	504	460	454~554	5	5037	* 4771.8	4885.9~5188.1
3	1008	964	958~1058				

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	35.3	* 30.8	32.3~38.3	2	100.7	* 87.7	97.7~103.7

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	32.0 (0.0)	32.6 (0.3)	31.0~33.0 (−0.5~0.6)	2	139.8 (59.9)	140.6 (60.3)	138.8~140.8 (59.4~60.5)

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	10.0	10.5	7.0~13.0	4	70.0	69.6	67.0~73.0
2	30.0	30.4	27.0~33.0	5	90.0	88.9	87.0~93.0
3	50.0	50.4	47.0~53.0				

**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	Measurement Variable	System ID	Last Cal.	Cal. Due
5000 CO_2	T-0660	07-15-20	07-15-28	200 CO	149848	03-24-20	03-24-28
N2	CT308798	06-28-20	06-28-28	Air	T608955	06-17-20	06-17-28
Flow	E003341	09-03-19	09-30-20	Flow	E003980	04-22-20	04-30-21
Flow	E003525	01-06-20	01-31-21	Flow	E003342	09-03-19	09-30-20
2000 C4H8	EB0054467	08-13-19	08-12-22	100 C4H8	CC507339	03-24-20	03-24-28
Temperature	E010657	02-14-20	02-28-21	Temperature	E010658	02-14-20	02-28-21
Temperture	E010655	01-21-20	01-31-21	Humidity	E003539	08-21-20	02-28-21

ChaoVang
VERIFIED

August 31, 2020
DATE

DOC ID CERT_GEN_WCC

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	71.33 (21.9)	°F (°C)
RELATIVE HUMIDITY	53.9	%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)	32.6 (0.3)	31.0~33.0 (−0.5~0.6)	2	139.8 (59.9)	140.6 (60.3)	138.8~140.8 (59.4~60.5)

HUMIDITY VERIFICATION — SYSTEM H-102 — *Unit: %RH*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	10.0	10.5	7.0~13.0	4	70.0	69.6	67.0~73.0
2	30.0	30.4	27.0~33.0	5	90.0	88.9	87.0~93.0
3	50.0	50.4	47.0~53.0				

CO_2 GAS VERIFICATION — SYSTEM G-101 — *Unit: ppm*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	0	0	0~50	4	3020	3025	2929~3110
2	504	501	454~554	5	5037	5026	4886~5188
3	1008	1027	958~1058				

CO GAS VERIFICATION — SYSTEM G-101 — *Unit: ppm*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	35	36	32~38	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	E010657	02-14-20	02-28-21
Temperture	E010655	01-21-20	01-31-21
5000 CO_2	T-0660	07-15-20	07-15-28
N_2	CT308798	06-28-20	06-28-28
Flow	E003341	09-03-19	09-30-20
Flow	E003525	01-06-20	01-31-21
2000 C4H8	EB0054467	08-13-19	08-12-22

Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E010658	02-14-20	02-28-21
Humidity	E003539	08-21-20	02-28-21
200 CO	149848	03-24-20	03-24-28
Air	T608955	06-17-20	06-17-28
Flow	E003980	04-22-20	04-30-21
Flow	E003342	09-03-19	09-30-20
100 C4H8	CC507339	03-24-20	03-24-28

Bao Yang
CALIBRATED

August 31, 2020
DATE

Doc. ID. CERT_GEN_WCC

TSI P/N 2300157