RPF Environmental
TESTING & CONSULTING SERVICES
Hazardous Materials Inspection & Assessment
Asbestos, Mold, Lead Paint, Radon, PCBs
Air Quality Testing and Investigations
Industrial Hygiene, Safety & Training

July 15, 2024

Thomas Touseau
Facilities Director
SAU 26, Merrimack School District
36 McElwain Street
Merrimack, NH 03154

Re: Indoor Air Quality Testing
Special Services Building - 2 Brentwood Drive, Merrimack, NH
RPF File 240256

Dear Mr. Touseau,

In accordance with our scope of work dated June 5, 2024, RPF Environmental (RPF) completed indoor air quality (IAQ) testing at the Special Services Building located at 2 Brentwood Drive in Merrimack, NH. As part of this preliminary survey, testing was completed for several common IAQ parameters, as well as sampling for airborne and surface fungal spores, total airborne fiber concentrations, airborne asbestos fibers, and bulk samples for asbestos. The survey was completed on June 6, 2024, by Sean Smith and Sonia Stead.

The Special Services Building is a 1-story structure with a basement. RPF was asked to perform this IAQ testing following reported concerns about the air quality in this building.

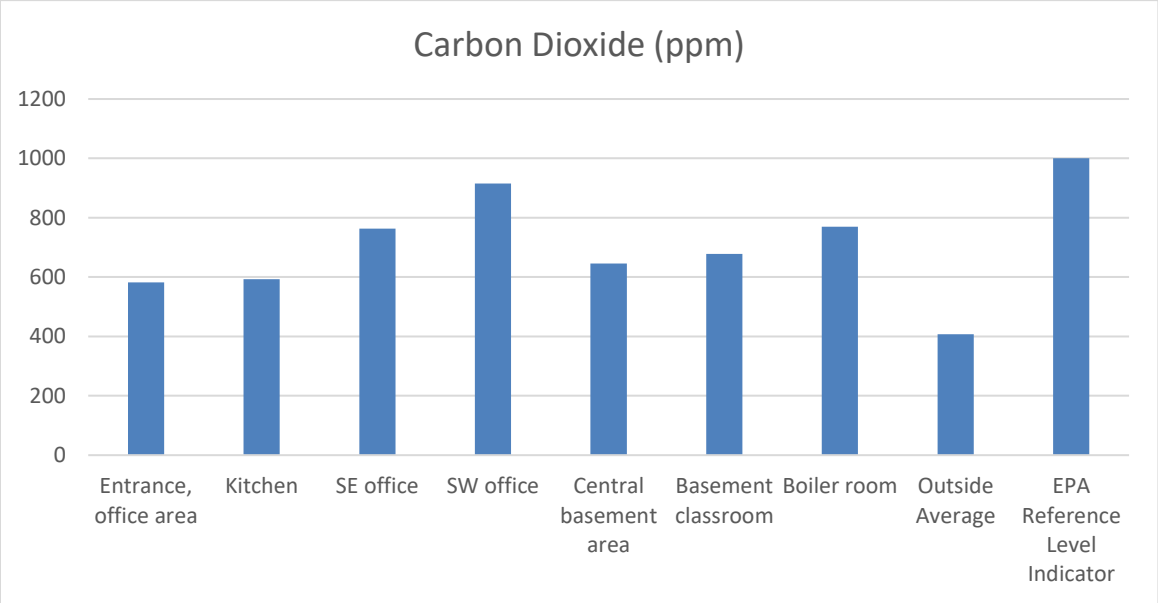
RESULTS

Carbon Dioxide

Carbon Dioxide (CO_2) gas is found in the atmosphere as a normal constituent at background levels of approximately 350 to 450 parts per million (ppm). CO_2 is also a by-product of human respiration. Typically, in building spaces with inadequate amounts of fresh air introduced and circulated, CO_2 levels and other building and occupant generated air contaminants will accumulate and increase over the course of a day. It is likely that the CO_2 levels will increase in any building space while occupied and fresh outside air is not brought into the space. CO_2 is typically not a problem in and of itself in general indoor environments; however, it is used as an indicator of the adequacy of the fresh air ventilation. CO_2 levels, in general, can be used as an indicator of sufficient ventilation in a space. The primary purpose of introducing fresh tempered outside air into buildings is to dilute the building of occupant generated air contaminants, which would improve the perceived IAQ and occupant comfort and productivity. Inadequate ventilation (and/or elevated temperatures) are frequently causes of complaints, such as respiratory, eye, nose and throat irritation, lethargy, and headaches.

The CO_2 results and testing locations are presented in Appendix A. CO_2 levels at all indoor locations tested were documented in the range of approximately 582 to 915 ppm, which is

well below the Occupational Safety and Health Administration Permissible Exposure Limit (OSHA PEL) of 5,000 ppm. These concentration ranges are also below the generally accepted guideline limit of 800 to 1,000 ppm.



The American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) recommends a guideline in their Standard 62-2001 for Ventilation for Acceptable Indoor Air Quality for a maximum of 700 ppm CO_2 above outside air concentrations as a value under which employee complaints are minimized. On the day of this testing, the outdoor ambient concentration of CO_2 was recorded at 407 ppm with a corresponding value of 1,107 ppm, for a maximum CO_2 for perceived acceptable air quality. The ASHRAE standard also calls for a minimum of 20 cubic feet of outside air (FOA) per minute per occupant be introduced into office spaces, and if applicable, 15 cfm per occupant of classrooms, to maintain dilution of contaminants and perceived indoor air quality.

According to the USEPA, pollutant or contaminant source control is usually the most effective way to improve indoor air quality. If source control efforts are not sufficient, increasing the amount of outdoor air coming indoors may prove to be helpful.

Carbon Monoxide

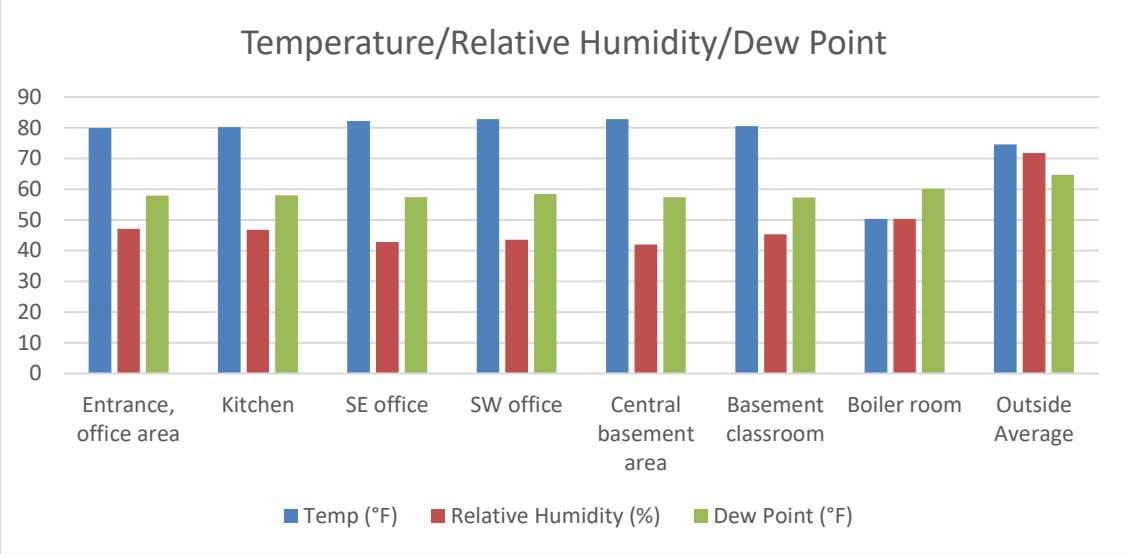
Carbon monoxide (CO) is an odorless, colorless, and toxic gas, and is a by-product of incomplete combustion. Exposure to CO can produce immediate and acute health effects. Transient low levels of CO in building spaces can sometimes be attributed to vehicle exhaust, cigarette smoke, or other sources of combustion in the actual space or adjacent to the air handlers for the space. Minor transient meter readings may also be due to changes in temperature and humidity depending on the test equipment used.

Carbon monoxide concentrations at the tested locations were below 1.3 ppm, which is below the OSHA PEL of 50 ppm. These results and testing locations are presented in Appendix A.

RPF recommends the use of carbon monoxide alarms.

Temperature, Relative Humidity and Dew Point

Temperature, relative humidity and dew point are all interrelated, and all play a role in the interior environment. Measurements were taken for all three on the day of testing and are presented in the following chart with actual testing locations and results included in appendix A.



Temperature will affect the occupant's perception of IAQ based on employee comfort levels, effect of drafts or airflow, and humidity levels in a building. In most cases, simple adjustments to thermostats and direction of airflow from registers can improve perceived IAQ. As a reference, the temperatures recommended by ASHRAE for general office space ranges from approximately 68° to 75° Fahrenheit in the winter, and from approximately 75° to 80° Fahrenheit in the summer. Temperature readings at all indoor locations tested were documented in the range of 50.3° to 82.8° Fahrenheit.

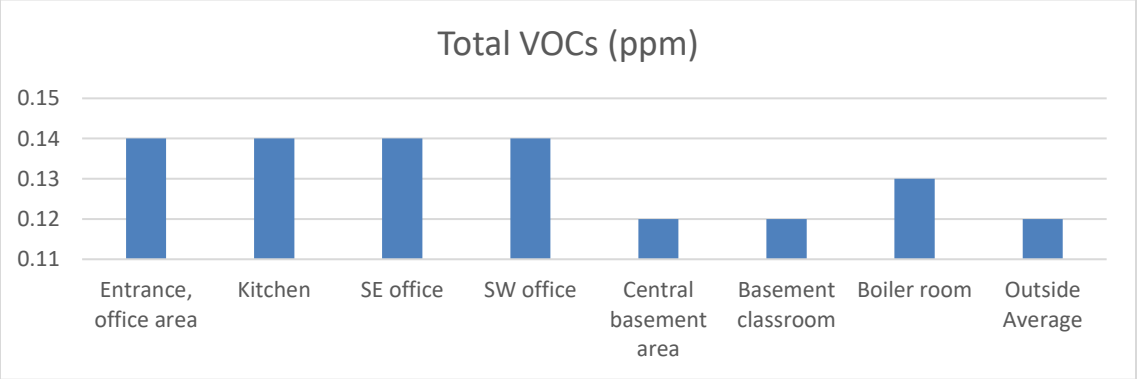
The amount of water vapor that can be contained in the air varies by the temperature and pressure of the air. The ratio of water vapor in the air to the maximum amount of water vapor the air can hold at a given temperature is expressed as relative humidity (RH). The recommended RH comfort range is 35% to 55%. In general, for buildings, the presence of excessive moisture can lead to mold growth and other biological contaminants. Low RH, common for buildings in New England during colder months, may contribute to irritated

mucous membranes, dry eyes and sinus discomfort while high relative humidity, common in summer, may cause discomfort, as it hinders the body's use of perspiration as a cooling mechanism. RH levels at the indoor locations tested during this survey were within the generally accepted comfort range.

Dew point is related to humidity and is the temperature below which water vapor may start to condense to form water droplets on a surface. If dew forms on interior building materials, the material may become wet, and subsequent fungal growth can occur. For instance, an uninsulated cold-water pipe may form condensation when the temperature of the metal surface is colder than the environmental dew point, and drip onto surfaces causing them to become wet. Dew point measurements on the day of testing ranged from 57.3° to 60.1° Fahrenheit. Based on these results, the interior temperature readings were all above the Dew Point readings. The results and testing locations are presented in Appendix A.

Volatile Organic Compounds

The scope of this survey included screening for total volatile organic compounds (VOCs). During this testing, total VOCs were measured at 0.14 parts per million (ppm) or less for all locations. These readings are within the "normal indoor air" range depicted below and are comparable to the outside air, which had an average reading of 0.12 ppm. These results are summarized below and presented in Appendix A.



The U.S. Environmental Protection Agency (EPA) reports that levels of volatile organic compounds (VOC) are almost always higher indoors compared to outdoors. Based on past testing, total VOC readings of up to 1 ppm are not atypical in general IAQ settings. In addition, the American Industrial Hygiene Association (AIHA) Technical Committee on Indoor Environmental Quality 1993 publication indicates that a general acceptable range for indoor air total VOC screening is less than 1.0 ppm. EPA studies have also found levels of about a dozen common organic pollutants to be 2 to 5 times higher inside homes than outside, regardless of whether the homes were located in rural or highly industrial areas.

Field experience also suggests the following guide for the use of PID test equipment (RAE Systems by Honeywell) to assess indoor environments:

- <0.1 ppm: normal outdoor air
- 0.1 to 0.4 ppm: normal indoor air
- ≥0.5 ppm: indicates the potential of IAQ contaminants

Individual VOCs can have vastly different standards for acceptable concentrations. Exposure to some specific compounds (such as formaldehyde) can result in health issues for some individuals, at even lower concentrations and levels even exceeding 0.1 ppm. In addition, an individual's odor and irritation responses to organic compounds may be highly variable. Therefore, the total VOC readings must be considered in that light. Further testing can be performed based on the screening results or other factors if you would like additional information on specific VOCs.

Total VOCs include a variety of chemicals that are emitted by a wide array of products used in building construction, maintenance, and consumer materials. Just a few examples of materials that commonly have VOC off-gassing include paints and lacquers, paint strippers, cleaning supplies, pesticides, building materials and furnishings, carpets, upholstery, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, air fresheners, and photographic solutions. Exposure to VOCs may have short-term and long-term adverse health effects. Studies suggest that the irritant potency of these VOC mixtures can vary.

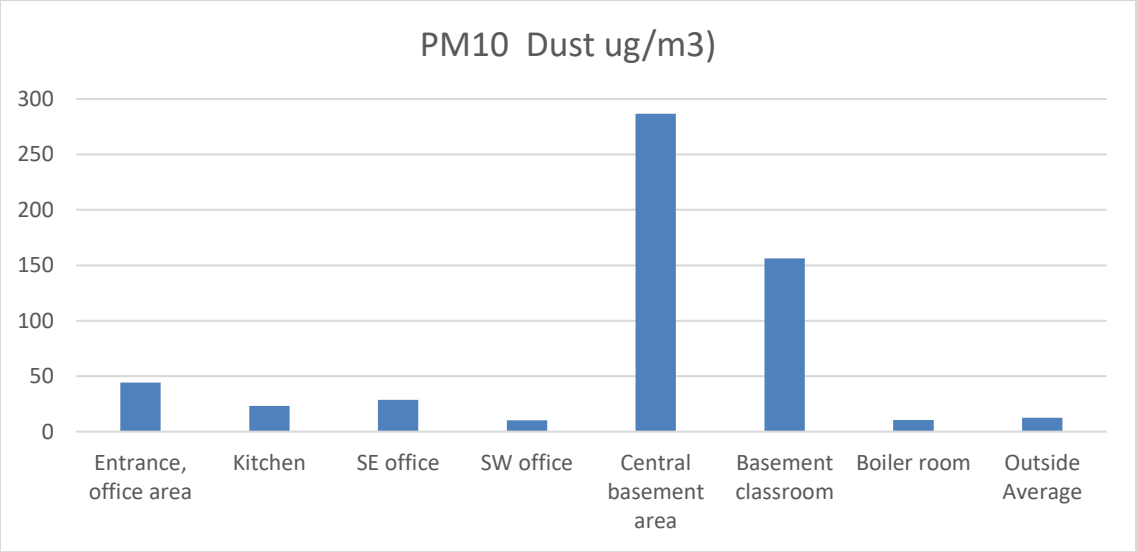
Total VOC screening does not include specific and individual chemical compound testing for the makeup of the overall VOCs concentrations; and, as with other pollutants, the extent and nature of the health effects will depend on many factors, including level of exposure and length of time exposed. Among the immediate symptoms that some people have experienced soon after exposure to some organics include:

- Eye and respiratory tract irritation
- Headaches
- Dizziness
- Visual disorders and memory impairment

Particulate Matter (PM_{10})

Particulate matter (PM) is a complex mixture of solid and/or liquid particulates suspended in air. Exposure to inhalable particulates, especially those at 10 microns and smaller, commonly referred to as PM_{10}, are a health concern. Concern of adverse effects to the heart and lungs is well established, especially in children, older adults, and those with existing heart or lung conditions. Outdoor concentrations of PM are of great concern to the EPA, but less is known about the health impacts of indoor PM. Some indoor sources of PM include cooking, combustion activities, some hobbies, outdoor sources introduced indoors, and biological sources.

Direct reading determinations for PM_{10} at all indoor locations tested were in the range of approximately 10.17 to 286.61 micrograms per cubic meter of air ($\mu g/m^3$). The results at most of the interior locations tested were elevated above the values found outside, which was approximately 12.48 $\mu g/m^3$. The US EPA does have a National Ambient Air Quality Standard at 150 $\mu g/m^3$ which was exceeded during the testing by a reading in the Basement Classroom and Central Basement Area. The World Health Organization (WHO) also has set a standard of 50 $\mu g/m^3$ as a 24-hour average and 25 $\mu g/m^3$ as an annual average exposure. These results and testing locations are presented in Appendix A.



These results indicate that the HVAC filters are not reducing the overall particle loading inside the building when compared to the outside air. For a building that implements the use of an HVAC system, it is typical to see a 25% to 35% reduction in total particulates inside a building compared to the outside concentration of particulates while the HVAC units are operational. The feasibility of upgrading the HVAC systems' filter efficiency rating could be investigated if complaints were to increase at this building. The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) has recommended filter minimum efficiency reporting value (MERV) of not less than six (6) for filters in HVAC systems supplying air to occupied office space (ASHRAE Standard 62.1-2004-5.9). Follow the manufacturer's recommendations for a filter change out schedule.

Other steps to reduce indoor PM_{10} concentrations include proper ventilation, away from HVAC intakes, of combustion appliances to the outdoors, proper exhaust vents in cooking areas, proper use of wood stoves, and professional maintenance of heating systems.

Visual Observations for Water Damage and Suspect Fungal Growth

For accessible areas, visual observations for overt signs of water damage and mold growth were completed by RPF during the survey. Water damaged porous building materials which have at any time been wet for 24 to 72 hours should be removed to prevent fungal growth. After addressing and eliminating the source of moisture, materials with water damage/fungal growth should be removed by a qualified professional.

A summary of the visual observations regarding water damage or suspect fungal growth throughout the areas of concern are as follows:

Location	Description
1st floor, Entrance office area	Water damage observed on the east wall and ceiling.
Basement	Water damaged observed on a section of wall. Suspect growth observed on insulation.

Moisture

Moisture readings were collected on various representative portions of accessible interior building flooring and building components throughout the scope of work areas. The moisture reading results were approximately <10 percent. Readings of <10 percent moisture can be considered non-detect for moisture content. These results and testing locations are presented below.

Location	Moisture (%)
Eastern wall of entrance, office	<10
North wall of entrance, office	<10
Southeastern office	<10
Southern wall	<10
East wall ceiling, water damage area	<10
Kitchen ceiling, above sink	<10
Kitchen wall, by lower support beam	<10
Office off kitchen, south wall	<10
Office off kitchen, west wall	<10
Carpet, eastern wall of entrance, office	<10
Boiler room, basement wall area	<10
Basement, central ceiling, water damage	<10
Carpet, green basement, central area	<10
Approximate Detection Limit	<10

Microscopic Screen and Fungal Identification-Surface Swab/Tape Lift Sampling

One swab sample each was collected from the below referenced locations for a total of 2 samples. These samples were collected to locate the presence or absence of fungi at the specific location sampled as noted below. These results and testing locations are presented in Appendix B.

Sample ID	Location	Results
060624-S201	Water damage, east wall, entrance office area.	No Spores Detected
060624-S202	East ceiling water damage entrance office area.	Light levels of Aspergillus/Penicillium-like spores and hyphal fragments present. Trace levels of hyphal fragments present.

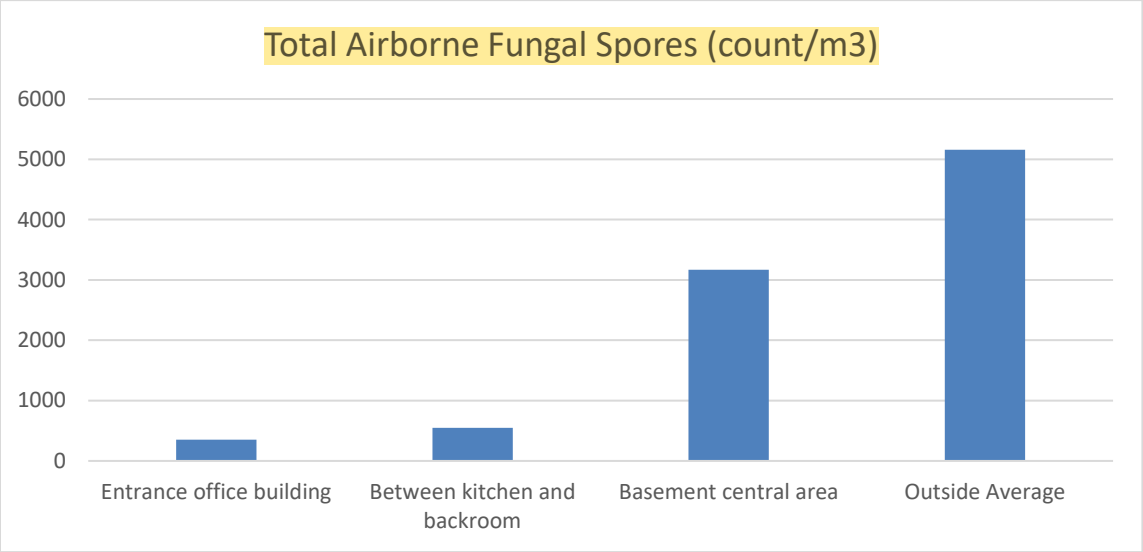
Microscopic Screen and Fungal Identification-Airborne Fungal Spores and Particulates

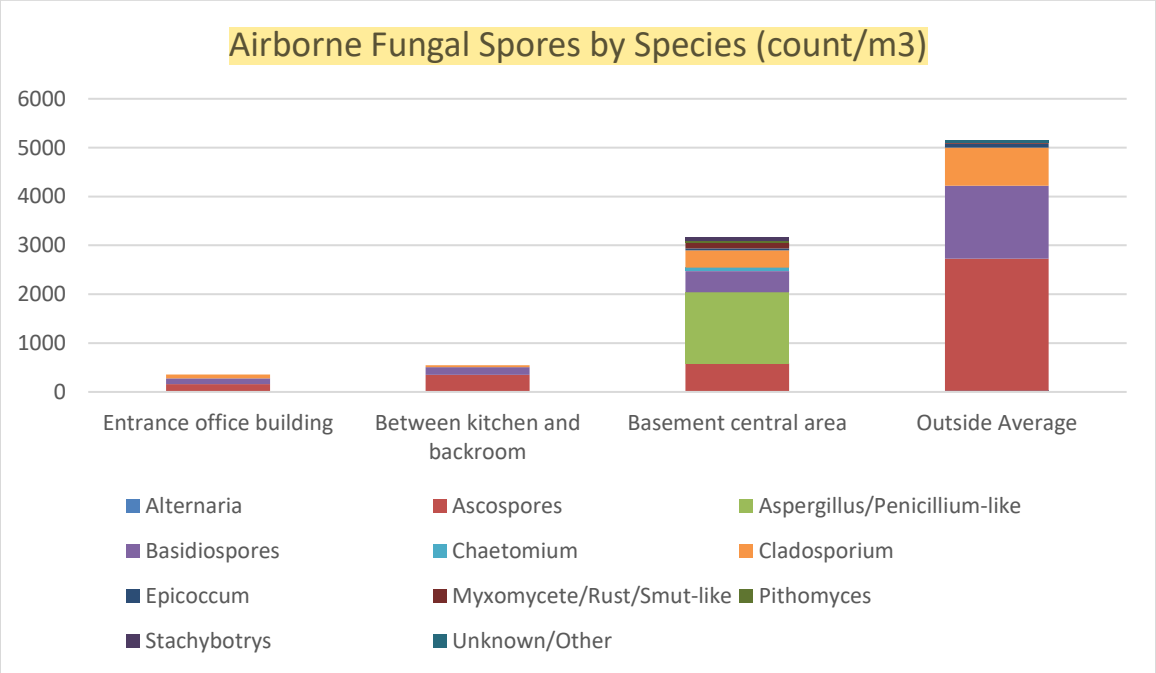
There are currently no regulatory methods or exposure limits for airborne spores or fungal metabolites for indoor air quality. General guidelines indicate that the indoor and outdoor concentrations should be similar for unaffected buildings. However, elevated concentrations of fungi and their various metabolic by-products can lead to allergic or sensitization reactions, toxic reactions to metabolites, and infections in susceptible populations of people. For those buildings with symptoms, inside airborne concentrations are typically elevated above the outdoor concentrations. In addition, the species documented inside and outside of the structure should be similar and the identification of species found in the indoor air sample(s) and not found in the outdoor air sample(s) would be indicative of the building as a likely source of contamination.

One area air sample each was collected from Entrance Office Building, Between Kitchen and Backroom, and the Basement Central Area. Two area air samples were also collected outside as controls. The requisite analytical field blank was also submitted, for a total of six (6) area air samples. The concentrations of airborne fungal spores and each testing location are presented below with actual laboratory analysis included in Appendix B of this report.

Sample ID	Location	Results
060624-A01 & 060624-A05	Outside Control Samples	Concentrations of Alternaria spores, Ascospores, Basidiospores, Cladosporium spores, Epicoccum spores, Myxomycete/Rust/Smut-like spores, unknown spores, and hyphal fragments present.
060624-A02	Entrance office building	Fungal spore concentrations well below the outside controls.
060624-A03	Between Kitchen and backroom	Fungal spore concentrations well below the outside controls.

Sample ID	Location	Results
060624-A04	Basement Central area	Elevated concentration of Aspergillus/Penicillium-like spores and trace concentrations of Chaetomium spores, Pithomyces spores, and Stachybotrys spores present when none were in the outside controls. Elevated concentration of hyphal fragments present when compared to the outside controls.





The concentration of total airborne fungal spores in each indoor sample was less than the concentration of total airborne fungal spores in the outdoor control samples.

The air sample collected in the basement had various types of fungal structures identified at either trace or elevated concentrations when none were present in the outdoor control samples including Aspergillus/Penicillium-like spores, Chaetomium spores, Pithomyces spores, and Stachybotrys spores. These results indicate that a possible source of fungal contamination may be present. RPF recommends HEPA vacuuming as part of routine maintenance to reduce indoor spores and to reduce dust in general. Many spores are carried indoors from the outdoors where we know spores are present.

Continual inspections for water damaged building materials and fungal growth are recommended as part of routine maintenance. RPF recommends removing water damaged building materials which, at any point, were wet for greater than 24 to 72 hours.

Total Airborne Fiber Concentrations

PCM air samples were collected on 0.8-micron pore size, 25-millimeter diameter, and mixed-cellulose-ester membrane filters in an open-faced orientation. PCM total airborne fiber concentrations were analyzed in accordance with NIOSH Method 7400. High-volume air pumps were used to collect the air quality samples, and sampling pumps were calibrated before and after each sampling period utilizing secondary calibration standards.

One area air sample was collected from the entrance office area, kitchen area, center of the basement area, and the basement classroom for total airborne fiber concentrations for a total of four samples. Three of the four samples had fiber concentrations either at or below the State of NH clearance criteria of 0.010f/cc. One sample had a slightly elevated concentration above the clearance criteria. The PCM air table is included in Appendix C.

RPF submitted these air samples for additional analysis to SAI. The lab analyzed all four samples using transmission electron microscopy (TEM) which is an asbestos specific test. Each of the air samples had no asbestos fibers detected. Actual laboratory results are included in Appendix C.

Asbestos-Containing Material (strike subtitle if asbestos only)

Asbestos is the name for a group of naturally occurring minerals that separate into strong, very fine fibers. The adverse health effects associated with asbestos exposure have been extensively studied for many years. Results of these studies and epidemiological investigations have demonstrated that inhalation of asbestos fibers may lead to an increased risk of developing one or more diseases. In all cases, extreme care must be used not to disturb asbestos-containing materials or to create fiber release episodes.

In the accessible locations surveyed, RPF identified three (3) homogeneous groups of accessible suspect asbestos containing material. Suspect materials were identified based on current industry standards, EPA, and other guideline listings of potential suspect ACM.

The following is a summary list of the suspect ACM identified and sampled during this survey:

- Cream 9" floor tile and black mastic
- Ceramic wall tile grout

A total of four (4) samples were extracted from the different groups of suspect material in accordance with EPA sampling protocols. Of the samples collected by RPF, asbestos was detected in two (2) groups of suspect ACM. Actual laboratory results are included in Appendix C.

The ACM identified during this survey consists of nonfriable material. The nonfriable ACM was observed to be in good to fair condition and, left undisturbed and properly managed, is unlikely to cause any major fiber release episodes. This survey was limited to the above referenced materials and a full inspection of these areas was not completed as part of the scope of work of this survey. Actual laboratory results are included in Appendix C.

PRELIMINARY OBSERVATIONS AND COMMENTS

In addition to the findings and recommendations provided above, RPF opinions related to the IAQ within the areas of the facility tested based on the results and our observations are presented below.

- Overall, the readings collected inside the building for each IAQ parameter tested during this survey were either within or below their respective standard and/or comfort range, except for PM10.

- There were PM10 readings within the building that were elevated above the outside readings. Most of the readings collected within the building were well below the NAAQS of 150 ug/m^3, except for readings collected in the Central Basement Area and Basement Classroom, which were above the standard. RPF recommends the feasibility of increasing/adding FOA to these areas. As indicated above, investigating the feasibility of upgrading the filters to a better MERV rating (such as MERV-13) could help make the system more efficient in removing particles.

- Heating systems should be inspected on an annual basis or more frequently as required by the manufacturer. RPF recommends implementing and maintaining a preventative maintenance and inspection program for the HVAC system including air filter change-out schedule on a quarterly basis and inspecting for the proper seating of air filters within the filter housing of each air handling unit in order to help eliminate potential air bypass of air

filters.

- Looking at the airborne fungal spore samples collected in the building, elevated Aspergillus/Penicillium-like spores and trace concentrations of Chaetomium spores, Stachybotrys spores, and Pithomyces spores were present in the air sample collected in the Basement Central Area. Stachybotrys is a fungal spore species that is indicative of long-term water damage because a material must be wet for months before this species begins to grow. RPF observed water damage in the entrance office area on the 1st floor and in the Basement. RPF collected surface fungal spore samples of the water damage on the East Wall and East Ceiling and in the Entrance Office Area. The Entrance Office Area surface sample had light levels of Aspergillus/Penicillium-like spores and trace levels of hyphal fragments. These results indicate that a source of fungal contamination is present in the basement area. RPF recommends that water and/or mold impacted building materials be cleaned and/or removed as depicted below.

- Visible fungal growth, once identified, should be removed by qualified personnel. There are currently no state or federal standards for the remediation of fungi. RPF references the current New York City Guidelines on Assessment and Remediation of Fungi in Indoor Environments and the Institute of Inspection, Cleaning and Restoration Certification (IIRC) recommended standard, IIRC S520, Standard and Reference Guide for Professional Mold Remediation when preparing work plans. Industry guidelines require that porous building materials which have moisture damage and mold contamination be properly packaged and disposed of by trained personnel with appropriate personal protective equipment (PPE) and engineering controls. Porous materials which are contaminated and left in place can become a reservoir for future fungal growth if exposed to moisture or high levels of humidity. Porous building materials such as carpeting, ceiling tiles, sheetrock and other wall coverings allowed to sit wet for more than 48 to 72 hours typically should be discarded and replaced, as applicable. Non-porous materials may be cleaned, disinfected and thoroughly dried. Work plan development and post remediation verification by a third party industrial hygiene firm, independent from the remediation contractor is also recommended as standard of care.

- Efforts should be made to clean surfaces to remove fungi, spores and metabolites. The use of disinfectants is not specifically recommended unless they are used to aid in the removal of the microbials as dead fungi, spores and metabolites have the potential to still cause allergic reactions in sensitized individuals. If disinfectants are used, persons should read and follow the manufacturer's directions, avoid mixing chemicals and use appropriate personal protective equipment.

- Regardless of the level of effort expended to remediate fungal growth, the potential for fungal growth to return exists if the building materials were to become wet again, or be subject to elevated humidity levels.

- Three of the four PCM samples collected in the building had total airborne fiber concentrations at or below the State of NH clearance criteria of 0.010f/cc. One sample was elevated above the State of NH clearance criteria. These samples were submitted for TEM analysis and each sample had no asbestos detected.

- Suspect 9" floor tile and black mastic and ceramic wall tile grout were sampled for asbestos content using PLM analysis. The 9" floor tile and mastic were positive for asbestos. The ACM floor tile and mastic were observed to be in good condition.

If you have any questions or require additional information on any sample results or recommendations, please feel free to contact our office. Thank you for utilizing the services of RPF for this important project.

Sincerely,
RPF Environmental, Inc.

Sean Smith
EH&S Consultant

Enclosures:
Appendix A: Testing Results
Appendix B: Fungal Spore Laboratory Results
Appendix C: PCM Table and Asbestos Laboratory Results
Appendix D: Example Picture
Appendix E: General Fungal Descriptions
Appendix F: Limitations and Methodologies

240256 Special Services Building 060624 IAQ Report

APPENDIX A

RPF Environmental
TESTING & CONSULTING SERVICES

TABLE 1

Preliminary IAQ Testing

Client: SAU 26 - Merrimack High School	**Site Address:** 38 McElwain St, Merrimack, NH 03054					**Date Samples Collected**: 06/06/24		
Location / Room	**Time**	**TVOC (ppm)**	**Carbon Dioxide (ppm)**	**Carbon Monoxide (ppm)**	**Temp (°F)**	**Relative Humidity (%)**	**Dew Point (°F)**	**PM10 (ug/m^3)**
Outside (pre)	8:12am	0.14	393	1.7	74.1	72.7	64.6	4.62
Entrance, office area	8:30am	0.14	582	1.3	79.9	47.1	57.9	44.38
Kitchen	8:32am	0.14	593	1.2	80.2	46.8	58	23.11
SE office	9:02am	0.14	763	1.3	82.2	42.8	57.4	28.66
SW office	9:10am	0.14	915	1.2	82.8	43.5	58.4	10.17
Central basement area	9:10am	0.12	646	1	82.8	42.0	57.4	286.61
Basement classroom	10:12am	0.12	678	1	80.5	45.3	57.3	156.25
Boiler room	10:15am	0.13	770	1	50.3	50.3	60.1	10.62
Outside (post)	11:23am	0.09	420	1.2	75.0	70.7	64.8	20.34
ACGIH TLV	-	-	5,000	25	-	-	-	-
OSHA PEL	-	-	5,000	50	-	-	-	-
ASHRAE recommended	-	-	1,107	2.5	-	35-55	-	-
EPA Reference Level Indicator	-	-	1,000	9	-	-	-	150

ppm – parts per million in air; ppb – parts per billion in air

OSHA PEL – Occupational Safety and Health Administration Permissible Exposure Limit for eight-hour time weighted average (8hr-TWA).
ACGIH TLV – American Conference of Governmental Industrial Hygienist Threshold Limit Value for eight-hour time weighted average (8hr-TWA).
ASHRAE – American Society of Heating, Refrigeration and Air Conditioning Engineers, 62-2001 standard.
EPA – Environmental Protection Agency.
Gray Wolf IAQ monitor has a sensitivity of +/- 1 ppm for carbon monoxide and +/- 0.01 ppm for volatile organic compounds.
Results of less than 1 ppm carbon monoxide or 0.01 ppm volatile organic compounds can be considered “non-detect”.
Gray Wolf Dust meter senses particles of less than 10 microns diameter.

Page 1 of 1

SAU 26 – Merrimack High School
38 McElwain St, Merrimack, NH 03054
(PM Edit – add limits as needed)

MOISTURE READING (RELATIVE %)

Samples Collected: 06/06/24

Time (Hours)	Sample Location	Moisture Reading (Relative %)
9:00am	Eastern wall of entrance, office	<10%
9:05am	North wall of entrance, office	<10%
9:08am	Southeastern office	<10%
9:10am	Southern wall	<10%
9:12am	East wall ceiling, water damage area	<10%
9:14am	Kitchen ceiling, above sink	<10%
9:15am	Kitchen wall, by lower support beam	<10%
9:20am	Office off kitchen, south wall	<10%
9:22am	Office off kitchen, west wall	<10%
9:38am	Carpet, eastern wall of entrance, office	<10%
10:30am	Boiler room, basement wall area	<10%
10:33am	Basement, central ceiling, water damage	<10%
10:38am	Carpet, green basement, central area	<10%
--	Approximate Detection Limit	<10

RPF File No.

Notes: -Please refer to the full text of the report for additional information and limitations on the results presented above.

APPENDIX B

Direct Exam: Swab Analysis

SAI Method B-SOP-005

Customer: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Brianna Ham
Sean Smith
Sonia Stead

Project: IAQ Mold Merrimack HS Special Services

Lab Order ID: **10053462**
Analysis: DES
Date Received: 06/07/2024
Date Reported: 06/11/2024

Sample ID	060624S201	060624S202						
Lab Sample ID	10053462_0001	10053462_0002						
Description	Water damage Eas	East ceiling water						
Lab Notes								
IDENTIFICATION								
Aspergillus/Penicillium-like	**No Spores Detected**	2						
Fruiting Bodies								
Hyphal Fragments		1						
Pollen								
Debris	1	2						

Disclaimer: This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. Unless otherwise noted blank sample correction was not performed on analytical results. Scientific Analytical Institute participates in the AIHA EMPAT program for fungi. EMPAT Laboratory ID: 173190. Reporting Limit equals Analytical Sensitivity. Analytical Sensitivity equals 1 spore or structure.

LEGEND: 1=Trace (1-10 Spores); 2=Light (11-100 spores); 3=Abundant (101-300); 4=Loaded (>300 spores)

Darrin Parrick (2)
Analyst

Approved Signatory

Scientific Analytical Institute, Inc. 4604 Dundas Dr. Greensboro, NC 27407 (336) 292-3888

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Customer: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Brianna Ham
Sean Smith
Sonia Stead

Project: IAQ Mold Merrimack HS Special Services

Lab Order ID: **10053460**
Analysis: STA
Date Received: 06/07/2024
Date Reported: 06/10/2024

Sample ID	060624-A101			060624-A102			060624-A103			**EXTERIOR**		
Lab Sample ID	10053460_0001			10053460_0002			10053460_0003			**AVERAGE**		
Description	(Pre) Outside test			Entrance office building			Between kitchen and backroom			**N/A**		
Lab Notes										**N/A**		
Volume (L)	150			150			150			**N/A**		
Analytical Sensitivity (counts/m³)	39			39			39			**N/A**		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Alternaria										<1	19.6	N/A
Ascospores	71	2780	54.6%	4	157	44.4%	9	353	64.3%	69	2710	52.7%
Aspergillus/Penicillium-like												
Basidiospores	36	1410	27.7%	3	118	33.3%	4	157	28.6%	38	1490	29.0%
Chaetomium												
Cladosporium	19	744	14.6%	2	78.4	22.2%	1	39.2	7.14%	20	784	15.3%
Epicoccum	3	118	2.31%							2	78.6	1.53%
Myxomycete/Rust/Smut-like										<1	19.6	N/A
Pithomyces												
Stachybotrys												
Unknown/Other	1	39.2	0.769%							2	58.8	1.53%
TOTAL	**130**	**5090**	**100.%**	**9**	**353**	**100.%**	**14**	**549**	**100.%**	**131**	**5160**	**100.%**
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal Fragments	3	118	-	1	39.2	-	2	78.4	-	3	98.2	-
Insect Parts	-	-	-	-	-	-	-	-	-	-	-	-
Pollen	13	509	-	-	-	-	5	196	-	11	431	-
Skin Cell % of Total Debris		**0-20%**			**40-60%**			**20-40%**			**N/A**	
Total Debris in Background		**40-60%**			**40-60%**			**60-80%**			**N/A**	

Darrin Parrick (6)
Analyst

Approved Signatory

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Customer: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Brianna Ham
Sean Smith
Sonia Stead

Project: IAQ Mold Merrimack HS Special Services

Lab Order ID: **10053460**
Analysis: STA
Date Received: 06/07/2024
Date Reported: 06/10/2024

Sample ID	060624-A104			060624-A105			060624-B106			**EXTERIOR**		
Lab Sample ID	10053460_0004			10053460_0005			10053460_0006			**AVERAGE**		
Description	Basement central area			Final (post) outside test			Analytical field blank			**N/A**		
Lab Notes										**N/A**		
Volume (L)	150			150			0			**N/A**		
Analytical Sensitivity (counts/m³)	39			39			1.0			**N/A**		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Alternaria				1	39.2	0.752%	**No Spores Detected**			<1	19.6	N/A
Ascospores	15	588	18.5%	67	2630	50.4%				69	2710	52.7%
Aspergillus/Penicillium-like	37	1450	45.7%									
Basidiospores	11	431	13.6%	40	1570	30.1%				38	1490	29.0%
Chaetomium	2	78.4	2.47%									
Cladosporium	9	353	11.1%	21	823	15.8%				20	784	15.3%
Epicoccum	1	39.2	1.23%	1	39.2	0.752%				2	78.6	1.53%
Myxomycete/Rust/Smut-like	3	118	3.7%	1	39.2	0.752%				<1	19.6	N/A
Pithomyces	1	39.2	1.23%									
Stachybotrys	2	78.4	2.47%									
Unknown/Other				2	78.4	1.5%				2	58.8	1.53%
TOTAL	**81**	**3170**	**100.%**	**133**	**5210**	**100.%**	**<1**	**<1.00**	**100.%**	**131**	**5160**	**100.%**
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal Fragments	14	549	-	2	78.4	-	-	-	-	3	98.2	-
Insect Parts	-	-	-	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	9	353	-	-	-	-	11	431	-
Skin Cell % of Total Debris		**20-40%**			**0-20%**			**0%**			**N/A**	
Total Debris in Background		**80-100%**			**60-80%**			**0-20%**			**N/A**	

Disclaimer: This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. Unless otherwise noted blank sample correction was not performed on analytical results. Scientific Analytical Institute participates in the AIHA EMPAT program for fungi. EMPAT Laboratory ID: 173190. Reporting Limit equals Analytical Sensitivity. Unless indicated, areas and volumes were provided by the customer.

Darrin Parrick (6)
Analyst

Approved Signatory

APPENDIX C

RPF Environmental
TESTING & CONSULTING SERVICES

Client:	SAU 26	**RPF File #:**	24.0256	**Date Sampled:**	6/6/2024	**Technician:**	Sean Smith, Sonia Stead
Site Address:	Merrimack HS Special Services Building			**Date Submitted:**	6/6/2024	**Technician:**	Sean Smith, Sonia Stead
RPF Technician:	Sean Smith, Sonia Stead			**Date Analyzed:**	6/6/2024	**Technician:**	Sean Smith
Analyzed by:	Sean Smith			**Reviewed by:**	Brianna Ham		

Field No.	Sample Description: Type, Inside or Outside Containment (if applicable), Location (floor, specific area), Activity During Sampling, Other	Volume (liters)	Detection Limit	Fibers	Fields	Blank	Density (f/mm^2)	Concentration (fiber/CC)
060624 - A01	Area air sample, Entrance office area, background air sample	1216	0.004	28.5	100	2	33.8	0.011
060624 - A02	Area air sample, kitchen area, background air sample	1216	0.004	20.5	100	2	23.6	0.007
060624 - A03	Area air sample, center of basement area, background air sample	1216	0.004	26.5	100	2	31.2	0.01

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and
40 CFR, Part 763, Subpart E, App.E

NVLAP LAB CODE 200664-0

Lab ID # 173190

Customer: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Sonia Stead

Project: #240256

Lab Order ID: **10053540**
Analysis: PLM
Date Received: 06/07/2024
Date Reported: 06/10/2024

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
060624-HB1a - A	Floor tile and mastic, small bathroom closet	**3% Chrysotile**		**97% Other**	Cream Non-Fibrous Homogeneous
10053540_0001	*floor tile*				Dissolved
060624-HB1a - B	Floor tile and mastic, small bathroom closet	**3% Chrysotile**		**97% Other**	Black Non-Fibrous Homogeneous
10053540_0005	*mastic*				Dissolved
060624-HB1b	Floor tile and mastic, small bathroom closet	**None Detected**		**100% Other**	Cream Non-Fibrous Homogeneous
10053540_0002	*sample does not match coc*				Crushed, Dissolved
060624-HB2a	Ceramic wall tile and grout	**None Detected**		**100% Other**	Cream Non-Fibrous Homogeneous
10053540_0003	*ceramic tile, no grout*				Crushed
060624-HB2b - A	ceramic wall tile and grout	**3% Chrysotile**		**97% Other**	Cream Non-Fibrous Homogeneous
10053540_0004	*floor tile- sample does not match coc*				Dissolved
060624-HB2b - B	ceramic wall tile and grout	**3% Chrysotile**		**97% Other**	Black Non-Fibrous Homogeneous
10053540_0006	*mastic- sample does not match coc*				Dissolved

Kiersten Smith (6)
Analyst

Approved Signatory

Scientific Analytical Institute, Inc. 4604 Dundas Dr. Greensboro, NC 27407 (336) 292-3888

Airborne Asbestos Analysis by Transmission Electron Microscopy

NIOSH 7402
SAI Method T-SOP-006

Customer: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Sean Smith

Project: 24.0256 Special Services SAU 26

Lab Order ID: **10053436**
Analysis: TNI
Date Received: 06/07/2024
Date Reported: 06/10/2024

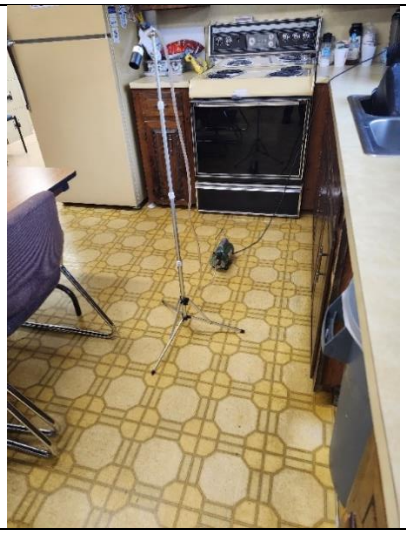
Sample ID *Lab Sample ID*	Description *Lab Notes*	Volume (L) *Area Analyzed (mm²)*	PCM Concentration (f/cc)*	Non-Asbestos Fiber Count	Asbestos Structures	Asbestos Fiber Count	Concentration (f/cc)
060624-01	Entrance office area	1216	.011	0	None Detected		<0.00086
10053436_0001		0.368					
060624-02	Kitchen area	1216	.007	0	None Detected		<0.00086
10053436_0002		0.368					
060624-03	Center of basement	1216	.01	1	None Detected		<0.00086
10053436_0003		0.368					
060624-04	Basement classroom	1216	.008	0	None Detected		<0.00086
10053436_0004		0.368					

*** PCM data not provided by client.**

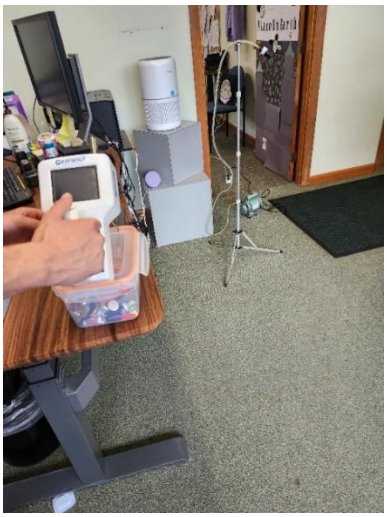
Russell Shelton (4)
Analyst

Approved Signatory

APPENDIX D



1. Kitchen 1st floor of Gray Building



2. Entrance office area

3. 1st floor kitchen

4. Entrance office area water damage area

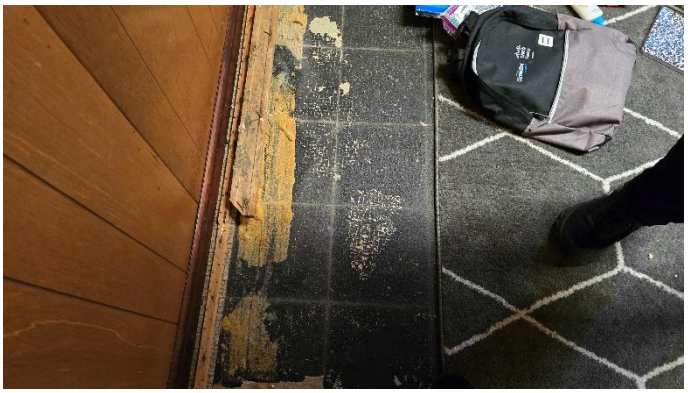
5. View of water staining.

6. Back office of 1st floor

EXAMPLE PICTURES		RPF Environmental TESTING & CONSULTING SERVICES
Site Address: SAU 26; Special Services Building		www.airpf.com **888-SAFE AIR** **File No. 24.0256**

7. View of peeling paint.

8. Basement insulation with mold



9. ACM 9” floor tile in basement

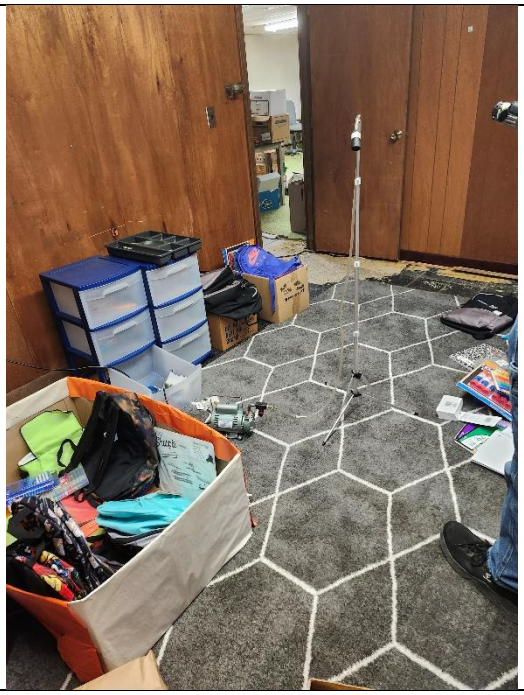
10. More water damage in the basement

11. Basement main area rug with water damage

12. Basement main area ceiling water damage

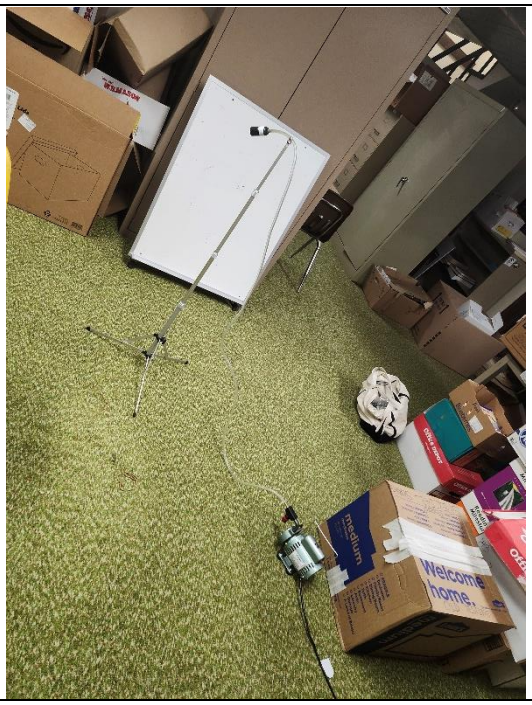
EXAMPLE PICTURES		RPF Environmental TESTING & CONSULTING SERVICES
Site Address: SAU 26; Special Services Building		www.airpf.com **888-SAFE AIR** **File No. 24.0256**

13. Water damage on 1st floor



14. Classroom in basement

15. Basement ceiling tiles near stair water damage



16. Basement main area

EXAMPLE PICTURES		RPF Environmental TESTING & CONSULTING SERVICES
Site Address: SAU 26; Special Services Building		www.airpf.com **888-SAFE AIR** **File No. 24.0256**

APPENDIX E

Regulatory standards for the testing for and exposure limits for airborne mold, and fungal spores have not been established. The presence of fungi and mold is common in many environments with over 1,000 fairly common species of mold, many we are routinely in contact with are not hazardous under normal conditions.

Alternaria

Alternaria is a large and widespread genus, the conidia of which are easily carried by the wind, with peak concentrations in the summer and early fall. *Alternaria* is commonly found in house dust, carpets, textiles, on horizontal surfaces in building interiors, and window frames. It is one of the main fungal causes of allergy, being a common type I & III allergen. Outdoors, it may be isolated from samples of soil, seeds and plants, and is frequently reported in air. The large spore size suggests that this fungus will deposit in the nose, mouth and upper respiratory tract causing nasal septum infections. It has also been associated with hypersensitivity pneumonitis. It is a common cause of extrinsic asthma. Acute symptoms include edema and bronchiospasms; chronic cases may develop pulmonary emphysema. Baker's asthma is associated with inhalation of *Alternaria* conidia present in flour. Other diseases caused by *Alternaria* include: Farmer's lung, mycotic keratitis, skin infections, and osteomyelitis. Also, the species *A. alternata* is capable of producing tenuazonic acid and other toxic metabolites that may be associated with disease in humans or animals. Several species are pathogenic to plants and contribute to the spoilage of agricultural products. *Alternaria* has been isolated from substrates such as sewage, leather, stone monuments, optical instruments, cosmetics, computer disks, and jet fuel

Ascospore

Ascospores are a general category of spores that have been produced by means of sexual reproduction (in a sack-like structure called an ascus). These are ubiquitous saprobes and plant pathogens, many of which are easily identifiable (i.e. *Chaetomium*). This group contains potential opportunistic pathogens, toxin producers, and allergens depending on the genus and species. A rupture in the top portion of the ascus disperses the spores during rain or in times of high humidity. Some asexual fungi, such as *Aspergillus* and *Penicillium* can become sexual under specific conditions, these are then considered ascomycetes and are given distinct names. The presence of these spores normally is associated with indoor air infiltration.

***Aspergillus/Penicillium* –like**

Aspergillus and *Penicillium* spores are indistinguishable via direct microscopic examination. *Aspergillus* tends to colonize continuously damp materials such as damp wallboard and fabrics. *Penicillium* is commonly found in house dust, on water-damaged wallpaper, behind paint and in decaying fabrics.

Basidiospore

Basidiospores are a general category of sexual spores that have been released from the basidium of a fungus. A ubiquitous type I & III allergen, saprobe and plant pathogen, mainly found in gardens, forests, and woodlands. Spores disseminate during rain or in times of high humidity. Rarely opportunistic pathogens, Basidiospores may produce toxins, including amanitins, monomethyl-hydrazine, muscarine, ibotenic acid, and psilocybin. Basidiospores are an agent of dry wood rot, which may destroy the structure wood of buildings.

Chaetomium

Chaetomium is found worldwide on a variety of substrates including paper, damp sheetrock, carpet, plant compost, soil, and between layers of wet plywood. Several species have been reported to play a major role in decomposition of cellulose-based materials, and is often found indoors with *Stachybotrys*. These fungi are able to dissolve the cellulose fibers in cotton and paper and thus cause the materials to disintegrate. The process is especially rapid under moist conditions. During the Second World War, countries lost a great deal of equipment to these species. *Chaetomium* is reported to have type I & III allergens, and can produce sterigmatocystin, a mycotoxin shown to cause kidney and liver damage in laboratory animals. It is not a common human pathogen, but it has been known to cause skin and nail infections. It is an ascomycete, and in most species the spores are lemon-shaped, with a single germ pore. The spore column results from the breakdown of the asci within the body of the perithecium. The perithecia of *Chaetomium* are superficial and barrel-shaped, and they are clothed with dark, stiff hair.

Cladosporium

Cladosporium is widely distributed in air and rotten organic material. *C. herbarum* is the most frequently found species in outdoor air in temperate climates. It is often found indoors, usually in lesser numbers than outdoors. The dry conidia become easily airborne and are transported over long distances. This fungus is often encountered in dirty refrigerators, especially in reservoirs where condensation is collected. It can easily be seen on moist window frames covering the whole painted area with a velvety olive-green layer. *Cladosporium* often discolors interior paint, paper, or textiles stored under humid conditions. Houses with poor ventilation, houses with thatched straw roofs and houses situated in damp environments may have heavy concentrations of *Cladosporium*, which will be easily expressed when domestic mold is analyzed. It is commonly found on the surface of fiberglass duct liner in the interior of supply ducts. It is also found naturally on dead & woody plants, food, straw, soils, paint, and textiles. The ability to sporulate heavily, ease of dispersal, and buoyant spores makes this fungus the most important fungal airway allergen; and together with *Alternaria*, it commonly causes asthma and hay fever in the Western hemisphere. More than 500 species have been identified. A few species of this genus cause disease, which range from phaeohyphomycosis, a group of mycotic infections characterized by the presence of dematacеous septate hyphae. Infections of the eyes and skin by black fungi (also classified as phaeohyphomycosis), and chromoblastomycosis, chronic localized infection of the skin and subcutaneous tissue that follows the traumatic implantation of the etiologic agent are also caused by this fungus. Chromoblastomycosis lesions are verrucoid, ulcerated, and crusted. Skin abscesses, mycotic keratitis and pulmonary fungus ball have been recorded in immunocompromised patients. It may also cause corneal infections and mycetoma, characterized by localized infections that involve cutaneous and subcutaneous tissue, fascia, and bone consisting of abscesses, granulomata, and draining sinuses, usually in immunocompromised hosts. *Cladosporium* produces the toxins cladosporin and emodin, but neither of these is very toxic. Fungal colonies are powdery or velvety olive-green to olive-brown.

Epicoccum

Epicoccum is a dematiaceous mitosporic mould widely distributed and commonly isolated from air, soil and foodstuff. It is found also in some animals and textiles. It is the common causative agent of leaf spots of various plants.

Hyphal Fragments

Hyphal fragments are generally viewed as an indicator of fungal growth. Hyphal fragments are the fruiting structures of mold (such as a tree has branches and a plant has stems). Hyphal fragments typically settle quickly, therefore, the presence of high amounts of hyphal fragments on surfaces (above 100/m3) suggests an active fungal growth is nearby.

Myxomycetes

Ubiquitous, type I allergen. Often found on decaying plant material, however occasionally found indoors. Dispersed by wind in the dry phase, while the wet amoebic phase is motile. Myxomycetes exhibit characteristics of protozoans and fungi. Indistinguishable from smuts under 600x microscopy.

Pithomyces

Pithomyces is found growing on decaying plants, especially grasses, soil, and wood in tropical areas, it is rare in cold climates. It may grow on paper but is not prolific indoors. This fungus has demonstrated allergenic activity; it is also considered an etiologic agent in immunocompromised patients. The most common saprophytic species, *P. chartarum* produces a mycotoxin called sporidesmin (a piperazinedione) known to be pathogenic in animals causing liver damage and facial eczema, a condition of severe dermatitis in cattle, sheep, and goats. *Pithomyces* can be found on dead vegetative material in pastures, especially ryegrass. It favors warm, wet, humid weather, heavy dews, or irrigation.

Rusts

The order uredinales, or rusts, are among the most important of the Basidiomycetes. There are about 4000-6000 species of rusts, all of which are plant parasites requiring at least one plant or grass as a host to complete its lifecycle. They attack more types of wild and domesticated plants than any other natural fungus. They have a complex lifecycle, having five different spore types including basidiospores, pycniospores, aeciospores, teliospores, and urediospores (the most common one found). It is a type I allergen, and not a known toxin producer. Rusts produce red or rusty to orange spores. They can be found on trees, flowers, grasses, and other living plant materials. Very rarely found growing indoors, unless their host plants are present.

Smuts

Ubiquitous, type I allergen. They are parasitic plant pathogens that require a living host. Most often found on corn, grass, weeds, flowering plants and other fungi; usually disseminated by wind. Indistinguishable from myxomycetes under 600x microscopy.

Stachybotrys

Considerable recent media attention has been focused on the fungi Stachybotrys chartum due to infant deaths in Cleveland from pulmonary hemosiderosis which may be associated with contamination of residences with this fungi. Stachybotrys requires and thrives on water damaged cellulose rich materials such as sheet rock, paper, ceiling tiles, cellulose containing insulation backing and wallpaper. The presence of this fungus in buildings is significant because of the mold's ability to produce mycotoxins, which are extremely toxic, such as Satratoxin H. Exposure to these toxins can occur through inhalation, ingestion or dermal exposure. Symptoms include dermatitis, cough, rhinitis, nose bleeds, a burning sensation in the mouth and nasal passage, cold and flu symptoms, headache, general malaise, and fever. Inhalation of conidia may also induce pathological changes (pneumomycotoxicoses). Satratoxin H has been reported to be abortogenic

in animals and in high doses or chronic low doses it can be lethal. S. chartarum produces other macrocyclic and trichoverroid trichothecenes and, like Memnoniella echinata, produces phenylspirodrimanes, which are immunosuppressive. Stachybotrys typically appears as a sooty black fungus occasionally accompanied by a thick mass of white mycelia. As a general rule, air sampling for Stachybotrys yields unpredictable results mainly due to the fact that this fungus is usually accompanied by other fungi such as Aspergillus and Penicillium that normally are better aerosolized than Stachybotrys.

Unidentifiable Spores

Unidentifiable spores are not classified as any of the recognized spores. They have a definite edge making it look "spore-like". Some commonly seen unidentifiable spores are spores that resemble an octopus with a large body and tentacle-like arms radiating from one side of the spore or a brown to black spore that resembles a four-leaf clover. Generally these spores can be cultured for definitive identification.

Information Source: Aerotech Laboratories Inc., 1501 W. Knudsen Drive, Phoenix, AZ, 85027; Microbial Fungi Glossary; www.aerotechlabs.com and EMSL Analytical, 107 Haddon Avenue, Westmont, NJ 08108; Fungi Summary; www.emsl.com

APPENDIX F

LIMITATIONS

1. The observations and conclusions presented in the Report were based solely upon the services described herein, and not on scientific tasks or procedures beyond the RPF Environmental, Inc. Scope of Work (SOW) as discussed in the proposal and/or agreement. The conclusions and recommendations are based on visual observations and testing, limited as indicated in the Report, and were arrived at in accordance with generally accepted standards of industrial hygiene practice and asbestos professionals. The nature of this survey or monitoring service was limited as indicated herein and in the report or letter of findings. Further testing, survey, and analysis is required to provide more definitive results and findings.

2. For site survey work, observations were made of the designated accessible areas of the site as indicated in the Report. While it was the intent of RPF to conduct a survey to the degree indicated, it is important to note that not all suspect ACBM material in the designated areas were specifically assessed and visibility was limited, as indicated, due to the presence of furnishings, equipment, solid walls and solid or suspended ceilings throughout the facility and/or other site conditions. Asbestos or hazardous material may have been used and may be present in areas where detection and assessment is difficult until renovation and/or demolition proceeds. Access and observations relating to electrical and mechanical systems within the building were restricted or not feasible to prevent damage to the systems and minimize safety hazards to the survey team.

3. Although assumptions may have been stated regarding the potential presence of inaccessible or concealed asbestos and other hazardous material, full inspection findings for all asbestos and other hazardous material requires the use of full destructive survey methods to identify possible inaccessible suspect material and this level of survey was not included in the SOW for this project. For preliminary survey work, sampling and analysis as applicable was limited and a full survey throughout the site was not performed. Only the specific areas and /or materials indicated in the report were included in the SOW. This inspection did not include a full hazard assessment survey, full testing or bulk material, or testing to determine current dust concentrations of asbestos in and around the building. Inspection results should not be used for compliance with current EPA and State asbestos in renovation/demolition requirements unless specifically stated as intended for this use in the RPF report and considering the limitations as stated therein and within this limitations document.

4. Where access to portions of the surveyed area was unavailable or limited, RPF renders no opinion of the condition and assessment of these areas. The survey results only apply to areas specifically accessed by RPF during the survey. Interiors of mechanical equipment and other building or process equipment may also have asbestos and other hazardous material present and were not included in this inspection. For renovation and demolition work, further inspection by qualified personnel will be required during the course of construction activity to identify suspect material not previously documented at the site or in this survey report. Bordering properties were not investigated and comprehensive file review and research was not performed.

5. For lead in paint, observations were made of the designated accessible areas of the site as indicated in the Report. Limited testing may have been performed to the extent indicated in the text of the report. In order to conduct thorough hazard assessments for lead exposures, representative surface dust testing, air monitoring and other related testing throughout the building, should be completed. This type of in depth testing and analysis was beyond the scope of services for the initial inspection. For lead surveys with XRF readings, it is recommended that surfaces found to have LBP or trace amount of lead detected with readings of less than 4 mg/cm^2 be confirmed using laboratory analysis if more definitive results are required. Substrate corrections involving destructive sampling or damage to existing surfaces (to minimize XRF read-through) were not completed. In some instances, destructive testing may be required for more accurate results. In addition, depending on the specific thickness of the paint films on different areas of a building component, differing amounts of wear, and other factors, XRF readings can vary slightly, even on the same building component. Unless otherwise specifically stated in the scope of services and final report, lead testing performed is not intended to comply with other state and federal regulations pertaining to childhood lead poisoning regulations.

6. Air testing is to be considered a "snap shot" of conditions present on the day of the survey with the understanding that conditions may differ at other times or dates or operational conditions for the facility. Results are also limited based on the specific analytical methods utilized. For phase contrast microscopy (PCM) total airborne fiber testing, more sensitive asbestos-specific analysis using transmission electron microscopy (TEM) can be performed upon request.

7. For asbestos bulk and dust testing, although polarize light microscopy (PLM) is the method currently recognized in State and federal regulations for asbestos identification in bulk samples, some industry studies have found that PLM may not be sensitive enough to detect all of the asbestos fibers in certain nonfriable material, vermiculate type insulation, soils, surface dust, and other materials requiring more sensitive analysis to identify possible asbestos fibers. In the event that more definitive results are requested, RPF recommends that confirmation testing be completed using TEM methods or other analytical methods as may be applicable to the material. Detection of possible asbestos fibers may be made more difficult by the presence of other non-asbestos fibrous components such as cellulose, fiber glass, etc., by binder/matrix materials which may mask or obscure fibrous components, and/or by exposure to conditions capable of altering or transforming asbestos. PLM can show significant bias leading to false negatives and false positives for certain types of materials. PLM is limited by the visibility of the asbestos fibers. In some samples the fibers may be reduced to a diameter so small or masked by coatings to such an extent that they cannot be reliably observed or identified using PLM.

8. For hazardous building material inspection or survey work, RPF followed applicable industry standards; however, RPF does not warrant or certify that all asbestos or other hazardous materials in or on the building has been identified and included in this report. Various assumptions and limitations of the methods can result in missed materials or misidentification of materials due to several factors including but not limited to: inaccessible space due to physical or safety constraints, space that is difficult to reach to fully inspect, assumptions regarding the determination of homogenous groups of suspect material, assumptions regarding attempts to conduct representative sampling, and potential for varying mixtures and layers of material sampled not being representative of all areas of similar material.

9. Full assessments often requires multiple rounds of sampling over a period of time for air, bulk material, surface dust and water. Such comprehensive testing was beyond the scope of RPF services. In addition clearance testing for abatement, as applicable, was based on the visual observations and limited ambient area air testing as indicated in the report and in accordance with applicable state and federal regulations. The potential exists that microscopic surface dust remains with contaminant present even in the event that the clearance testing meets the state and federal requirements. Likewise for building surveys, visual observations are not sufficient alone to detect possible contaminant in settled dust. Unless otherwise specifically indicated in the report, surface dust testing was not included in the scope of the RPF services.

10. For abatement or remediation monitoring services: RPF is not responsible for observations and test for specific periods of work that RPF did not perform full shift monitoring of construction, abatement or remediation activity. In the event that problems occurred or concerns arouse regarding contamination, safety or health hazards during periods RPF was not onsite, RPF is not responsible to provide documentation or assurances regarding conditions, safety, air testing results and other compliance issues. RPF may have provided recommendations to the Client, as needed, pertaining to the Client's Contractor compliance with the technical specifications, schedules, and other project related issues as agreed and based on results of RPF monitoring work. However, actual enforcement, or waiving of, contract provisions and requirements as well as regulatory liabilities shall be the responsibility of Client and Client's Contractor(s). Off-site abatement activities, such as waste transportation and disposal, were not monitored or inspected by RPF.

11. For services limited to clearance testing following abatement or remediation work by other parties: The testing was limited to clearance testing only and as indicated in the report and a site assessment for possible environmental health and safety hazards was not performed as part of the scope of this testing. Client, or Client's abatement contractor as applicable, was responsible for performing visual inspections

of the work area to determine completeness of work prior to air clearance testing by RPF.

12. For site work, including but not limited to air clearance testing services, in which RPF did not provide full site safety and health oversight, abatement design, full shift monitoring of all site activity, RPF expresses no warranties, guarantees or certifications of the abatement work conducted by the Client or other employers at the job site(s), conditions during the work, or regulatory compliance, with the exception of the specific airborne concentrations as indicated by the air clearance test performed by RPF during the conditions present for the clearance testing. Unless otherwise specifically noted in the RPF Report, visual inspections and air clearance testing results apply only to the specific work area and conditions present during the testing. RPF did not perform visual inspections of surfaces not accessible in the work area due to the presence of containment barriers or other obstructions. In these instances, some contamination may be present following RPF clearance testing and such contamination may be exposed during and after removal of the containment barriers or other obstructions following RPF testing services. Client or Client's Contractor is responsible for using appropriate care and inspection to identify potential hazards and to remediate such hazards as necessary to ensure compliance and a safe environment.

13. The survey was limited to the material and/or areas as specifically designated in the report and a site assessment for other possible environmental health and safety hazards or subsurface pollution was not performed as part of the scope of this site inspection. Typically, hazardous building materials such as asbestos, lead paint, PCBs, mercury, refrigerants, hydraulic fluids and other hazardous product and materials may be present in buildings. The survey performed by RPF only addresses the specific items as indicated in the Report.

14. For mold and moisture survey services, RPF services did not include design or remediation of moisture intrusion. Some level of mold will remain at the site regardless of RPF testing and Contractor or Client cleaning efforts. RPF testing associated with mold remediation and assessments is limited and may or may not be representative of other surfaces and locations at the site. Mold growth will occur if moisture intrusion deficiencies have not been fully remedied and if the site or work areas are not maintained in a sufficiently dry state. Porous surfaces in mold contaminated areas which are not removed and disposed of will likely result in future spore release, allergen sources, or mold contamination.

15. Existing reports, drawings, and analytical results provided by the Client to RPF, as applicable, were not verified and, as such, RPF has relied upon the data provided as indicated, and has not conducted an independent evaluation of the reliability of these data.

16. Where sample analyses were conducted by an outside laboratory, RPF has relied upon the data provided, and has not conducted an independent evaluation of the reliability of this data.

17. All hazard communication and notification requirements, as required by U.S. OSHA regulation 29 CFR Part 1926, 29 CFR Part 1910, and other applicable rules and regulations, by and between the Client, general contractors, subcontractors, building occupants, employees and other affected persons were the responsibility of the Client and are not part of the RPF SOW.

18. The applicability of the observations and recommendations presented in this report to other portions of the site was not determined. Many accidents, injuries and exposures and environmental conditions are a result of individual employee/employer actions and behaviors, which will vary from day to day, and with operations being conducted. Changes to the site and work conditions that occur subsequent to the RPF inspection may result in conditions which differ from those present during the survey and presented in the findings of the report.

METHODOLOGY

The results of the air quality testing are representative of the conditions present on the day of the testing and should be considered a snap shot of conditions within the facility. Additional rounds of testing may be required to obtain a statistically valid set of data representative of a variety of conditions which may be present within the facility.

Each of the methods used is discussed separately below.

Carbon Dioxide, Carbon Monoxide, Relative Humidity, Temperature, Dew Point, and Volatile Organic Compounds

Direct reading determinations for carbon dioxide (CO_2), carbon monoxide (CO), relative humidity (RH), temperature (T), dew point, and total volatile organic compounds (VOCs) were completed using a Greywolf Indoor Air Quality Monitor. The Greywolf was calibrated for CO_2 and CO with a span gas of known concentration prior to the start of the testing program.

Airborne Particulates

Direct reading determinations for airborne particulates at the size range of 10 microns and lower were measured using a Greywolf Handheld 3016-IAQ Airborne Particulate Meter. Thirty second samples were collected at each sampling location.

Moisture

A Tramex moisture encounter plus, which enables a non-invasive moisture measurement and detection in a wide range of building materials, was used to conduct direct reading determinations for approximate moisture content in accessible building materials. The instrument operates on the principle that the electrical impedance of a material varies in proportion to its moisture content. The instrument measures the electrical impedance of the sample by creating a low frequency alternating electric field between the electrodes. This field penetrates the material under test to a depth of approximately 1 ¼ inches. The Tramex meter was zero checked, dry reading verified and field checked prior to the start of the testing program.

Microscopic Screen and Fungal Identification-Surface Swab Sampling

Surface swab sampling of representative surfaces where suspect mold growth was observed and was completed using surface swabs. A sterile swab was wetted with buffer solution and wiped over the surface of the affected areas and immediately placed in its proper handling container, sealed with tape for shipping and labeled. The RPF Industrial Hygienist performed the swab sampling using separate sets of latex gloves on his hands or washed hands with isopropyl gel prior to each sample to reduce the potential for cross contamination. At the completion of the sampling, the samples were sealed, labeled and

shipped on blue ice under chain of custody to Scientific Analytical Institute (SAI) of Greensboro, NC for analysis. SAI is accredited by the AIHA for analysis of microbiological samples. The method will detect many but not all fungi present on the limited surface which was tested.

Microscopic Screen and Fungal Identification-Airborne Fungal Spores and Particulates

Sampling for airborne fungal spores and particulates was completed using a hi-volume air-sampling pump calibrated at a rate of approximately 15 liters of air per minute (lpm) using Zefon Air-O-Cell spore trap cassettes. All samples were collected at approximately three to five feet above the ground for a period of ten minutes per cassette per location. The Air-O-Cell cassette sampling and analysis method provides for the identification and quantification of many, but not all, genus of fungal spores that may be present in the air on the day of the testing and does not determine the viability of fungi spores but rather a total count of spores, both viable and non-viable. At the completion of the sampling, the samples were sealed, labeled, and shipped under chain of custody to Scientific Analytical Institute (SAI) of Greensboro, NC for microscopic analysis. This method will detect many but not all fungal spores present in the air on the day of the testing. SAI is accredited by the AIHA for analysis of microbiological samples. Additional rounds of testing may be required to fully document fungal ecology due to high variability of spore concentrations.