INDOOR AIR QUALITY REPORT

By: Michael Sireci, MS, CMA, LAI

January 9, 2018

Barnstable High School
744 West Main Street, Hyannis, MA

Barnstable High School
IAQ Assessment

Introduction:

I conducted environmental assessments of Barnstable High School on October 31 and November 14, 2017. I was accompanied by Brooke Styche, President of the Barnstable Teachers Association and by Mike Smith, Vice President. During this investigation, I took samples for mold including indoor air, tape lift and swab samples as well as conducted a visual walk through. During the walk through I took photographs, which appear at the end of the document. I took moisture readings in both ceiling tile and in the concrete slab.

Barnstable High School is a public high school located in the village of Hyannis, which is in the Town of Barnstable. It is the largest high school in Barnstable County on Cape Cod. It is divided into 5 "houses," described as "schools within a school." BHS is approximately 440,000 square feet and enrolls approximately 2,100 students in grades 8-12. The school is operated by the Barnstable Public School District.

The school was founded in the 19th century and relocated to its present location in 1959. The school has also gone through three (3) different major renovations and building additions over the years, with the last one being completed in 1998.

The original layout lacked the present library and cafeteria, which were added later on. A unique feature of the building is that there are two (2) cafeterias. Originally, the high school hosted a vocational school which was later relocated. The basement of the original building was built for use as a bomb shelter as well.

In 1963, the 1600s wing was added. The school underwent another renovation in 1976, which added the field house, cafeteria, library and some classrooms nearby. In 1975, the vocational high school closed because of the opening of Cape Cod Regional Technical High School in Harwich. The wing was then turned into the art wing for the school.

In 1998, the wing that was part of the old vocational high school was demolished so that new classrooms could be added in place of the shop rooms. The new renovation also added the Performing Arts Center, the 1100s, lower 1200s, 1700s, 2200s and 2700s.

Discussion:

This report provides data on carbon dioxide levels (CO_2), relative humidity (RH), temperature and mold. Swab samples, surface samples and air samples were taken for mold. The Barnstable Teachers Association's request was that this investigation focus on the presence of mold and potential sources of moisture. They reported that building occupants made complaints to the Barnstable Teachers Association and the Administration about upper respiratory issues, fatigue

and headaches, itchy eyes and also reported that symptoms improved after occupants left the building.

This investigation is not a comprehensive evaluation of the building, but is focused on certain "houses" of the building. The testing was conducted in sites that the association members had complained about experiencing adverse health effects they attributed to the building environment due to what they observed they thought was visible mold. For the purposes of orientation, if you reference the front of the buildings as the north side, most of the elevated tape lift samples were taken from the south side, first floor of the 1500s wing where there are three (3) tape lift mold samples with elevated levels of mold reported.

In room 1506, you can see remnants of moisture intrusion in the ceiling (see photo #1) in the corner above the door. There is also moisture and evidence of mold around the windows (see photo #2). I took a tape lift sample there which came out positive. In room 1506, a leaking skylight was being renovated. I could see very little evidence that any normal mold remediation practices were being followed to prevent the spread of mold spores or methods used to avoid occupant exposure (see photos #3 & #4).

In room 1515, there is evidence of moisture-damaged ceiling tiles (see photos #5 and #6). Room 1515 is occupied by a teacher who is being treated by a physician for adverse health effects. She stated that the physician indicated that these issues are related to her work environment. There were several water stains on ceiling tiles as evidence of moisture intrusion and possible mold contamination. The room is a science lab. The drain in the room had a moisture reading of 6.9% (see floor plan with concrete moisture readings). A surface sample taken above the white board was elevated and had a range of mold spores including Penicillium/aspergilius, Cladosporium, Epicoccum species, Myxomycete-like and Pithomyces species. Several of these species were absent in the control sample. The air sample was normal with a debris rating of two (2), which means the results are easily readable by the lab and speaks to reliability. The air sample did show evidence of Penicillium/aspergilius and ascospores, but at a level below the control sample. A second swab sample was taken on a flat surface closer to the drain and it showed high levels of Penicillium. Further investigation is warranted. There were five (5) different species of molds in the surface sample. None of the other rooms had that variety of species present. The Penicillium reading was high in the swab sample. Penicillium was also present in the surface sample. What is interesting is that the air samples were normal. The air sample debris rating is 2, which means that the sample didn't have a lot of background matter present and there is an increased likelihood that the interpretation done at the lab is reliability, although it is undeniable that there are a variety of settled out mold species in the room. When air samples are taken, levels in the air may be comparable to levels outside for several reasons including: at the time the air sample was taken, the HVAC system may have been drawing spores out of the room at a high rate and replacing stale air with filter and/or treated outside air. Mold spores are not visible to the naked eye and will waft in the air. The room was unoccupied at the time of the testing and spores will tend to settle without any mechanical, natural or human activity. (Mold assessors have been known to run a leaf blower in a room prior to air sampling to lift settled mold spores off surfaces). Regardless of the normal air reading, there is clear evidence that there are settled mold spores on surfaces in room 1515.

Adjacent to room 1515 is a greenhouse. Organic material in the greenhouse will naturally produce mold spores. The vent from the greenhouse is adjacent to room 1515 (see photo #7). There is no seal at the bottom of the door from the outside leading to the green house. Pests could freely enter and leave through the space at the bottom of the door and a door sweep should be attached to the door.

Outside of the science lab area adjacent to the 1500 wing is an acid reduction tank (see photos #9, #10 and #11). The grade of the top of the tank appears to be higher than a classroom (photo #11) and during the wet season the tank overflows. It's been reported to me that waste water from the tank floods the classroom. You can see from the condition of the classroom that it is currently not in use and that much of the furniture and other materials in the classroom have been destroyed. There are visible water stains and the smell of mold in the room.

In room 2207 there are visible water stains on the ceiling tile (see photo # 12). When I tested the tile with a moisture meter, there was a 30% moisture reading. Long-term moisture readings at that level could support significant mold growth including but not limited to the Stachybotrys species. Stachybotrys exposure can have serious health effects on building occupants.

In room 2210 there are visible water stains on the ceiling tiles (see photo # 13). When I tested the tile with a moisture meter, there was a 9% moisture reading. Consistent moisture readings at that level could support significant mold growth including but not limited to the Stachybotrys species. Stachybotrys exposure can have serious health effects on building occupants.

The 1400s wing had three (3) elevated tape lift samples. One (1) was taken outside of room 1409 where there were elevated levels of penicillum/aspergillus and cladosporium (see photo #14). Outside room 1406, I tested the ceiling next to the laundry room (see photo #16). Penicillum/aspergillus as well as stachybotrys were present. Stachybotrys levels are elevated when water levels are high over long periods of time. Stachybotrys mycotoxicosis can have significant health effects on humans characterized by dermatitis, cough, rhinitis, itching or burning sensation in the mouth, throat, nasal passages and eyes. This means there is a constant flow of moisture.

The Performing Arts Center also had two (2) elevated samples (see photo #16). This particular section of the building has a pungent musty smell. I took two (2) swab samples in this area and the penicillium levels were high. The air sample had a normal result, but there was a high three (3) debris rating. As a result, the air sample isn't reliable. There is a large amount of carbon materials stored in the area including gowns, hats and cardboard boxes.

The teacher in room 1203 states that she cleans mold off the floor almost every day in the fall and spring. I took moisture readings above and through vinyl tile and levels were quite high ranging from 3.1% to 3.8%. These percentages understate the actual level of moisture in the slab because the reading was done above the vinyl tile. Four percent (4%) is generally considered "wet" by contractors. The moisture diagram may be useful when trying to determine the levels of moisture relative to each other when trying to determine the source.

Photo's 18 through 23 are all pictures of stained ceiling tiles in the building. The source of moisture should be investigated in each instance, sealed and the tiles replaced.

Instruments and Units of Measurement:

Carbon dioxide:

CO_2 measurements were taken because they help determine the amount of fresh air entering an environment. To maximize air exchange, the Massachusetts Department of Public Health (MDPH) Bureau of Environmental Health, recommends that both supply and exhaust ventilation operate continuously during periods of occupancy.

MDPH recommends that carbon dioxide levels be maintained at 800 parts per million (ppm) or below. A ventilation rate of 20 cubic feet per minute (cfm) per occupant of fresh air provides optimal air exchange resulting in carbon dioxide levels at or below 800 ppm in the indoor environment in each area measured. This is because most environmental and occupational health scientists involved with research on IAQ and health effects have documented significant increases in IAQ complaints and/or health effects when carbon dioxide levels rise above the MDPH guidelines of 800 ppm for schools, office buildings and other occupied spaces (Sundell et al., 2011).

Providing adequate fresh air ventilation with open windows and maintaining the temperature in the comfort range during the cold weather season is impractical. Mechanical ventilation is usually required to provide adequate fresh air ventilation.

Carbon dioxide is not a problem in and of itself. It is used as an indicator of the adequacy of the fresh air ventilation. As carbon dioxide levels rise, it indicates that the ventilating system is malfunctioning or the design occupancy of the room is being exceeded. When this happens, a buildup of common indoor air pollutants can occur, leading to discomfort or health complaints.

Inadequate ventilation is a major cause of complaints such as respiratory, eye, nose and throat irritation, lethargy and headaches.

Temperature:

The MDPH recommends that indoor air temperatures be maintained in a range of 70° F to 78° F in order to provide for the comfort of building occupants. M.G.L. Ch. 149 S. 113, requires schools maintain a minimum temperature of 66-68° F. In many cases concerning IAQ, fluctuations of temperature in occupied spaces are typically experienced, even in a building with an adequate fresh air supply. It is also difficult to maintain comfort without operating a HVAC system as designed (i.e. blocking/obstructing or deactivating units via the thermostat on unit ventilators).

Relative Humidity:

The MDPH recommends a comfort range of 40 to 60 percent for indoor air relative humidity. Humidity levels in the building would be expected to drop during the heating season. The sensation of dryness and irritation is common in a low relative humidity environment. Low relative humidity is a very common problem during the heating season in the northeast part of the United States.

Methods:

The **Tel Aire 7001 Carbon Dioxide Meter** was used to take CO_2, Relative Humidity and Temperature readings. The instrument has a measurement range of 0 ppm to 9,999 ppm (CO_2); 10% to 95% RH (relative humidity) and 0°F to 137 °F (temperature). The meter was recently calibrated for accuracy.

The **Tramex CMEX II** is a digital concrete moisture meter. It delivers instant and accurate measurements of moisture in concrete and other screed and flooring materials. This meter measures up to 6.9% moisture content (MC) in concrete and 7 – 40% MC in wood with an optional pin-type probe attachment. It takes measurements up to a depth of 1.75 inches from the surface of the slab. Readings are displayed on a digital display. Tramex considers readings of 4% or under as normal. Anything above 4% is considered wet. The test results and the locations of where the samples were taken are embedded in the attached room diagrams.

Mold:

There are currently no guidelines or standards promulgated by a government agency or widely recognized scientific organization for the interpretation of surface or airborne mold spore levels. Molds live in the soil, on plants, and on dead and decaying matter. Molds produce tiny spores to reproduce. When mold spores land on a damp spot, they may begin growing and digesting whatever carbon material they land on in order to survive. Exposure to molds has been linked to symptoms such as headaches, nasal irritation, dizziness, fatigue and nausea. Molds can trigger asthma attacks and allergic reactions.

The results of air samples, tape lift samples and swab sampling can vary because mold growth and spores aren't spread evenly across surfaces or in the air in an environment and can change over time.

Air Samples:

Airborne mold samples were measured in selected rooms. Indoor airborne spore levels and species are compared to outdoor airborne mold spore levels and species.

Mold air samples were collected using the **My Mold Detective Air Sampling Pump** which is a direct read total particulate air sampling device. It works using the inertial impaction principal similar to other spore trap devices. It is designed for the rapid collection and analysis of airborne particulate including bio-aerosols (e.g. mold spores, pollen, insect parts, skin cell fragments). It

collects both viable and non-viable particulate and inorganic particles. The method involves drawing a known quantity of air through a sterile sampling cassette for 5 minutes with a flow rate of 15 l/min. Subsequent to sampling, the cassette is sealed and transferred to a microbiology laboratory under a chain of custody protocol for microscopic analysis. A third party American Industrial Hygiene Association (AIHA)-Accredited lab analyzed samples and interpreted the results. Concentration levels are ranked as normal, slightly elevated or elevated.

Each air sample has a debris rating. The debris rating can help you understand the reliability of the sample result. It essentially will tell you how much other matter was present on the slide when it was analyzed at the lab. Debris rating looks at the amount of particulate matter and skin fragments present on the slide; graded from 1-5 with one (1) being very little, while a debris rating of five (5) is unreadable. The higher the rating the more likelihood spores may be underestimated and overlap with background particulates.

Total Background Interpretation Chart Non-mold Particulate Level Description:

- (1) Up to 25% of the sample obscured by fibrous particulates, skin fragments, or insect fragments. Results are not affected by debris.
- (2) Up to 50% of the sample obscured by fibrous particulates, skin fragments, or insect fragments.
- (3) Up to 75% of the sample obscured by fibrous particulates, skin fragments, or insect fragments. Results may not be accurate because the background debris overlaps the spores in the field.
- (4) Over 75% of the sample obscured by fibrous particulates, skin fragments, or insect fragments.
- (5) Entire sample obscured by fibrous particulates, skin fragments, or insect fragments. Sample is unreadable.

Analytical specificity refers to the ability of an assay to measure on particular organism or substance, rather than others, in a sample.

Tape Lift Samples:

Mold tape-lift samples were collected of visible mold and provide a direct examination of a surface. A direct exam allows for the determination of the presence of fungal spores as well as what types of fungi are present. The presence of biological materials on a particular surface is not a direct indication of what may be in the air.

Swab Samples:

Sterile swabs were used to test the level of microbial contamination on various surfaces. Swab samples were analyzed for total viable spore counts referred to as colony forming units.

Environmental Assessments Results:

CO2, RH and Temperature:

The following assessments for Carbon Dioxide, Relative Humidity and Temperature were conducted at Barnstable High School.

		Standard: 800 ppm	**Standard: 40-60%**	**Standard: 70-78° F**
Room	**Occupants**	**CO_2**	**RH**	**Temp in degrees F**
1705	0	902	58%	58.7
1407	24	974	47%	65.2
1409	20	772	47%	67
1205	0	983	50%	70
2207	0	925	50%	70

Mold Data:

The following assessments for mold were taken using tape lift surface samples.

Surface Samples				
Room level	**Result**	**Spore type/species**		
1206 wall board	elevated	Penicillium/aspergilius cladosporium		
1205	normal	Basidiospores		
1407 ceiling	elevated	Cladosporium		
1406 laundry ceiling	elevated	Penicillum/aspergillus stachybotrys		
1409 ceiling	elevated	Penicillum/aspergillus cladosporium		
1506	elevated	Cladosporium		
1506 floor	slightly elevated	Cladosporium Myxomycete-like		
1515 top of white board		Penicillium/aspergilius Cladosporium Epicoccum species Myxomycete-like Pithomyces species		
2207 ceiling	No species found			
2207 ceiling	No species found			
2723	elevated	Cladosporium		
2210 ceiling	No species found			
Deans A floor	normal	Ascospores		
Deans ceiling	elevated	Penicillium/aspergilius		

The following assessments for mold were taken using swab samples.

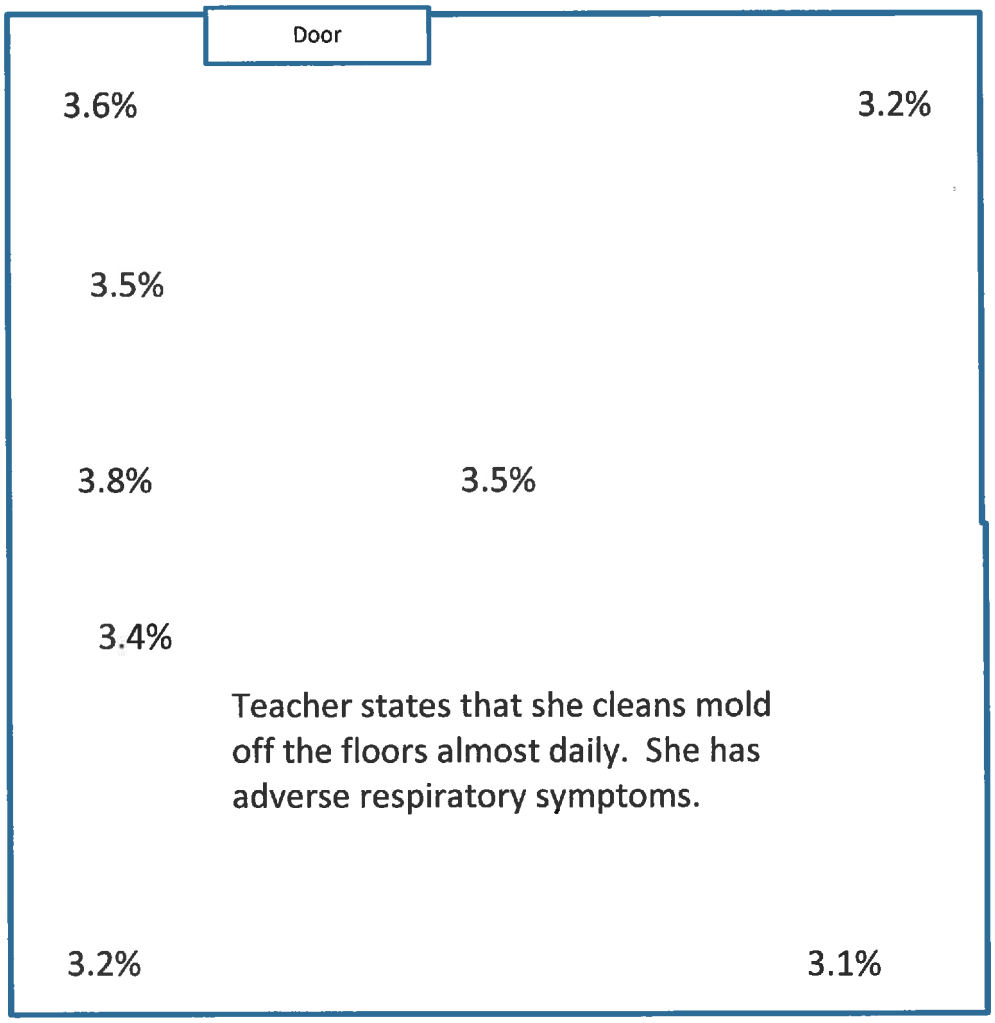
Swab Samples				
Room level	**Result**	**Spore type/species**	**Spore type/species**	**Spore type/species**
1103 music	Alternaria – low	Cladosporium-medium	Myxomycetes- low	Penicillium-high
Music – hat storage area	Curvularia – low	Myxomycetes-low	Unidentifiable Spores - low	Penicillium-high
1505 ceiling	Cladosporium high	Ulocladium-rare		
1506 window	Cladosporium high			
1515	Cladosporium low	Penicillium – high		

The following assessments for mold spores in the air were taken.

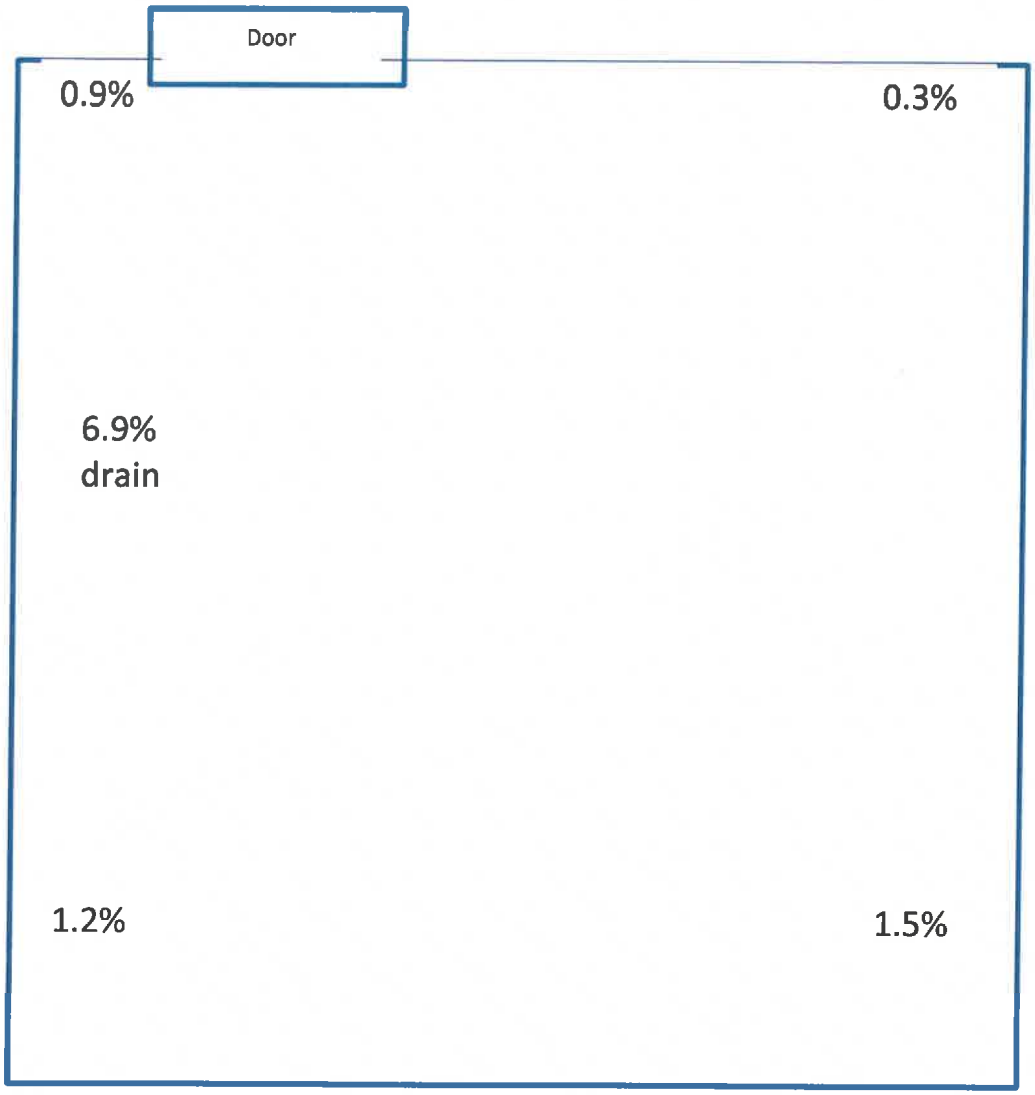
Air Samples				
Room level	**Result**	**Spore type/species**	**Spore type/species**	**Spore type/species**
1205 some spore counts appear slightly elevated	Penicillium/aspergilius	(2) debris rating		
1102 music room	normal	(3) High debris rating		
1407	normal	(3) High debris rating		
1505	normal	(2) debris rating		
1506	normal	(2) debris rating		
1515	normal	(2) debris rating		
1705	normal	(3) High debris rating		

The following diagrams illustrate the percentage of moisture using a Tramex sensor into the concrete slab up to 1 ¾ inches. The reading was taken above vinyl tile so the readings underestimate actual moisture content.

Room 1203



Room 1515



Recommendations:

I conducted several types of indoor environmental sampling. This report looks at a limited number of classrooms and should not be viewed as a comprehensive environmental analysis or necessarily representative of the entire building. That said, the report can be used as a tool when conducting a comprehensive assessment and as a guide when conducting a remediation

The process of assessment and remediation should be conducted by a certified mold remediator or assessor. The remediator should follow accepted Institute of Inspection, Cleaning and Restoration Certification (IICRC R520-2015) protocols or National Organization of Remediators and Mold Inspectors (NORMI) Mold Remediation Protocols (MRP) of guidelines for remediation.

There were 14 tape lift samples taken and nine (9) locations were elevated. There were five (5) swab samples taken and all five (5) had evidence of mold. These sites included: Rooms 1206, 1407, 1406, 1409, 1505, 1506, 1515, 2723, the "Deans" room, and the performing arts area. Assessment samples should be taken in each of the five (5) "houses" of the building that capture all HVAC air handling zones.

The presence of moisture and mold growth should be investigated further. The building should be kept as moisture-free as possible. All sources of moisture should be explored, identified and repaired. There are several teachers who commented that they have seen visible mold. Map out the building and identify all sites where there is a presence of visible mold.

I'd suggest that the Barnstable Teachers Association distribute, collect and process the data from the IAQ Nordic Survey provided by the MTA.

A written remediation protocol prior to taking remedial action is recommended. When conducting renovations, isolate contaminated areas and determine if the level of contamination is a Level 1 remediation (< 10 square feet) or Level 2 remediation (> 10 square feet). The process should be the same for Level 1 and Level 2 mold remediation and generally following step such as:

1. Identify and repair the water problem.
2. Isolate the contaminated area(s). Placing the room under negative pressure; building the proper enclosures with a decontaminating room, using 6 mil polyurethane sheeting;
3. Suppress dust;
4. Remove contaminated materials. Reference the Environmental Protection Agency (EPA) document, "Mold Remediation in Schools and Commercial Buildings," (http://www.epa.gov/mold/mold_remediation.html) for guidance.
5. Place materials in plastic bags (double bag materials with six (6) mil or heavier plastic bags).
6. Clean all non-porous materials and wood surfaces that are moldy. decontaminate all materials to be salvaged that may have settled mold spores by using a proper enzyme cleaner

7. Clean and sanitize the affected area and egress. The process for Level 1 remediation differs from Level 2 remediation. For Level 1, clean with a damp cloth and/or mop with detergent solution. Level 2 requires you to vacuum all surfaces with a HEPA vacuum and then clean all surfaces with a damp cloth and/or mop and detergent solution. Discard wipes as described above by bagging them.
8. Visibility test. All areas should be visibly free of contamination and debris — no dust and dirt means no mold.
9. Dry. Cleaned materials should be dried to allow leftover moisture to evaporate. To speed up the drying process, use fans, dehumidifiers or raise the indoor air temperature.
10. Replace. All materials that were moved should be replaced or repaired.
11. Conduct post remediation testing.

Monitor and empty the acid reduction tank in order to prevent an overflow.

Finally, I think it's important to say that a health and safety committee should be established in the High School with teachers, paraprofessionals, custodians and buildings and grounds representatives, administrators from the High School and the District, student representatives and a professional consultant to address environmental and health concerns in the building. This group can identify concerns, prioritize projects, and be very powerful advocate for improvements.

Disclaimer:

This document was designed to follow current known industry guidelines for the interpretation of microbial sampling and analysis. Since interpretation of mold analysis reports is a scientific work in progress, it may as such change over time. Michael Sireci and the Massachusetts Teachers Association make no express or implied warranties as to health of persons or property from only the samples analyzed. The client and any and all others reviewing this document are hereby notified that due to the subjective nature of fungal analysis and the mold growth process, laboratory samples and interpretations thereof can and do change over time relative to the originally sampled material. Michael Sireci and the Massachusetts Teachers Association reserve the right to properly dispose of all samples after the testing of such samples is sufficiently completed or after a seven (7) day period, whichever is greater.

Barnstable High School IAQ

Walkthrough Evaluation Photographs

#1: Rm 1506 ceiling/pipe burst two years ago.

#2: Rm 1506 possible visible mold and moisture.

#3: Renovation on water damaged skylight. No barriers erected.

#4: Skylight renovations without barriers.

#4 cont'd: Skylight renovations without barriers.

#4 cont'd: Skylight renovations without barriers.

#5: Rm 1515 evidence of roof leak possible mold.

#6: Rm 1515 ceiling stains and floor drain (possible methane gas release).

#6 cont'd: Rm 1515 ceiling stains and floor drain (possible methane gas release).

#7: Vent from greenhouse next to room 1515.

#8: Doors to storage area and greenhouse. Needs a door sweep.

#9: Acid reduction tank grade to adjacent building.

#10: Acid reduction tank (1)

#11: Abandoned room lower and adjacent to acid reduction tank.

#12: Rm 2207 30% wet ceiling tile; no windows; ceiling vents not operating.

#13: Rm 2210 9% wet ceiling tile.

#14: Rm 1409 water stain possible visible mold.

#15: Laundry room. AC on roof may be flooding. Check drip pan.

#16: Music room.

#16 cont'd: Music Room.

#17: Rm 1203 issues with moisture in the slab.

#18: Hallway ceiling 1700 next to elevator.

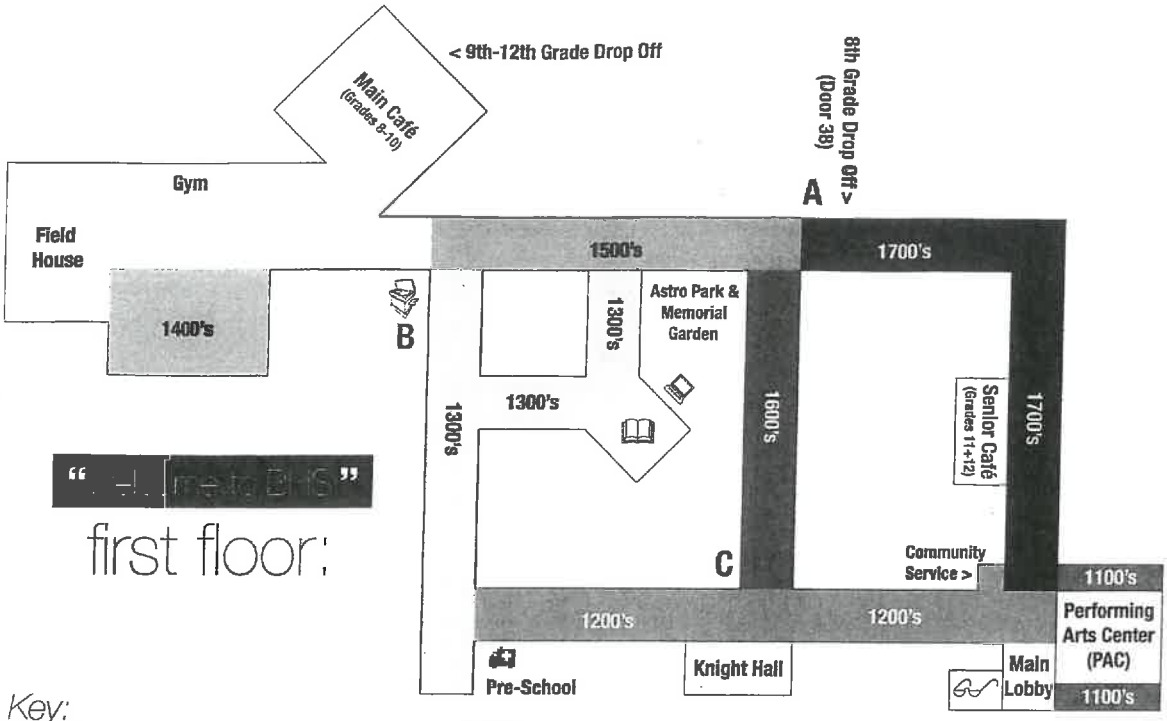
#19: Ceiling next to water main 1700.

#20: Visible mold outside girls/boys bathroom.

#21: Visible mold outside girls/boys bathroom.

#22: Ceiling outside jr/sr cafeteria.

#23: Ceiling in hallway outside gymnasium-possible visible mold.



"Welcome to BHS"

first floor:

Key:

1100's: Music
1200's: English and Math
1300's: Personal Development and Foreign Language
1400's: Personal Development and Foreign Language
1500's: Science
1600's: Math
1700's: Art, Social Studies, Special Education

ABC: House Offices
: Coppee Shop
: Library
: Nurse
: Main Office includes:
: Tech Office

Principal
Assistant Principal
Reception
Data Processing

Key:

2100's: 8th grade
2200's: 8th grade
2300's: Alternative learning program (above library)
2600's: 2601-2603 (other), 2604-2609 (8th grade)
2700's: Art, English, social studies, 8th grade

DE: House Offices
: 8th Grade Nurse
: Main Guidance

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

William D. McKinney,
Director

Asbestos Inspector

MICHAEL SIRECI

Eff. Date: [illegible]/17

Exp. Date: 12/06/18

18

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NATIONAL ORGANIZATION OF REMEDIATORS AND MOLD INSPECTORS

Michael Sireci

NORMI Trained Professional

NORMI Member ID# 12572

Certified through 02/2019

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5 Constitution Way, Unit A Woburn, MA 01801
Phone/Fax: (781) 933-8411 / (781) 933-8412
http://www.EMSL.com / bostonlab@emsl.com

Order ID: 131705000
Customer ID: UNNE25
Customer PO:
Project ID:

Attn: Mike Sireci
Union Environmental Assessment
98 Blueberry Lane
Concord, MA 01742

Phone: (978) 844-2322
Fax:
Collected: 10/31/2017
Received: 11/03/2017
Analyzed: 11/09/2017

Proj: Barnstable High School

Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Swab Samples (EMSL Method: M041)

Lab Sample Number:	131705000-0001	131705000-0002	131705000-0003		
Client Sample ID:					
Sample Location:	Room 1505 Ceiling	Room 1506 Window	Room 1515		
Spore Types	Category	Category	Category	-	-
Agrocybe/Coprinus	-	-	-	-	-
Alternaria	-	-	-	-	-
Ascospores	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-
Basidiospores	-	-	-	-	-
Bipolaris++	-	-	-	-	-
Chaetomium	-	-	-	-	-
Cladosporium	*High*	*High*	Low	-	-
Curvularia	-	-	-	-	-
Epicoccum	-	-	-	-	-
Fusarium	-	-	-	-	-
Ganoderma	-	-	-	-	-
Myxomycetes++	-	-	-	-	-
Paecilomyces	-	-	-	-	-
Rust	-	-	-	-	-
Scopulariopsis	-	-	-	-	-
Stachybotrys	-	-	-	-	-
Torula	-	-	-	-	-
Ulocladium	Rare	-	-	-	-
Unidentifiable Spores	-	-	-	-	-
Zygomycetes	-	-	-	-	-
Penicillium	-	-	*High*	-	-
Fibrous Particulate	-	-	-	-	-
Hyphal Fragment	-	-	-	-	-
Insect Fragment	-	-	-	-	-
Pollen	-	-	-	-	-

Category: Count/per area analyzed
Rare: 1 to 10 Low: 11 to 100 Medium: 101 to 1000 High: >1000

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut
* = Sample contains fruiting structures and/or hyphae associated with the spores.

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or Other Approved Signatory

Initial report from: 11/09/2017 14:47:28

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

EMSL Analytical, Inc.
5 Constitution Way, Unit A Woburn, MA 01801
Phone/Fax: (781) 933-8411 / (781) 933-8412
http://www.EMSL.com / bostonlab@emsl.com

Order ID: 131705226
Customer ID: UNNE25
Customer PO:
Project ID:

Attn: Mike Sireci
Union Environmental Assessment
98 Blueberry Lane
Concord, MA 01742

Phone: (978) 844-2322
Fax:
Collected: 11/14/2017
Received: 11/16/2017
Analyzed: 11/24/2017

Proj: Barnstable High School

Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Swab Samples (EMSL Method: M041)

Lab Sample Number:	131705226-0001	131705226-0002			
Client Sample ID:					
Sample Location:	Rm 1103 Music Concert Area	Rm 1102 Music Hat Storage			
Spore Types	Category	Category	-	-	-
Agrocybe/Coprinus	-	-	-	-	-
Alternaria	Low	-	-	-	-
Ascospores	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-
Basidiospores	-	-	-	-	-
Bipolaris++	-	-	-	-	-
Chaetomium	-	-	-	-	-
Cladosporium	*Medium*	-	-	-	-
Curvularia	-	*Low*	-	-	-
Epicoccum	-	-	-	-	-
Fusarium	-	-	-	-	-
Ganoderma	-	-	-	-	-
Myxomycetes++	Low	Low	-	-	-
Paecilomyces	-	-	-	-	-
Rust	-	-	-	-	-
Scopulariopsis	-	-	-	-	-
Stachybotrys	-	-	-	-	-
Torula	-	-	-	-	-
Ulocladium	-	-	-	-	-
Unidentifiable Spores	-	Low	-	-	-
Zygomycetes	-	-	-	-	-
Penicillium	*High*	*High*	-	-	-
Fibrous Particulate	-	-	-	-	-
Hyphal Fragment	-	-	-	-	-
Insect Fragment	-	-	-	-	-
Pollen	-	-	-	-	-

Category: Count/per area analyzed
Rare: 1 to 10 Low: 11 to 100 Medium: 101 to 1000 High: >1000

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut
* = Sample contains fruiting structures and/or hyphae associated with the spores.

No discernable field blank was submitted with this group of samples.

Steve Grise, Laboratory Manager
or Other Approved Signatory

Initial report from: 11/24/2017 11:46:34

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

NATIONAL ORGANIZATION OF REMEDIATORS AND MOLD INSPECTORS

LAB ANALYSIS REPORT

(HTTP://V1.MYMOLDDETECTIVE.COM/SURFACE/DOWNLOAD/GURL=HTTP://V1.MYMOLDDETECTIVE.COM/LAB-ANALYSIS-PDF/?REPORTID=23046)

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PRINT

ORDER SUMMARY (JAVASCRIPT:;)

LAB ANALYSIS REPORT

CONFIRMATION #:	23046
DATE COLLECTED:	11/14/2017 17:20:34
DATE RECEIVED:	11/21/2017 10:00:00
DATE ANALYZED:	11/24/2017 18:48:06
LAB ANALYSIS BY:	EMSL ANALYTICAL, INC.

CUSTOMER INFORMATION

NAME:	MICHAEL SIRECI
PHONE:	9788442322
EMAIL:	MSIRECI@MASSTEACHER.ORG
DATE REPORTED:	11/14/2017 5:20:34 PM
PROPERTY:	VISIBLE MOLD, MUSTY ODORS, WATER STAINS,
SYMPTOMS:	

PROPERTY NAME:	BARNSTABLE HIGH SCHOOL
PROPERTY ADDRESS:	744 WEST MAIN STREET, HYANNIS, MA, 02601
PROPERTY TYPE:	COMMERCIAL
RELATION:	OTHER
OCCUPANTS:	COMPLAINTS

CALL A MYMOLDDETECTIVE ® REPRESENTATIVE NOW TO DISCUSS YOUR RESULTS.

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Thank you for choosing MyMoldDetective®!

SAMPLE LOCATION	1205				RESULT	OUTDOOR			
CLIENT SAMPLE NUMBER	104055					82398			
RESULT	! Slightly Elevated					Control			
Spore Identification	Raw Count	Spores per m^3	Percent of Total	In/Out		Raw Count	Spores per m^3	Percent of Total	In/Out
Ascospores	-	-	-	-		7	400	28.2	-
Basidiospores	1	50	3.3	1:1		1	50	3.5	-
Cladosporium Species	3	200	13.3	1:1		3	200	14.1	-
Hyphal Elements	-	-	-	-		-	-	-	-
Myxomycete-Like	1	50	3.3	-		-	-	-	-
Penicillium/Aspergillus Group	24	1200	80	1.56:1	Slightly Elevated	15	770	54.2	-
Total	29	1500	99%			26	1420	100%	
Debris Rating	2*					3*			
Analytical Sensitivity	51					51			
Sample Volume (L)	65					65			
Lab Sample Number	371725687-0002					371725687-0001			

SAMPLE LOCATION	1102 MUSIC CARP	RESULT	OUTDOOR
CLIENT SAMPLE NUMBER	112786		82398
RESULT	✔ Normal		Control

Spore Identification	Raw Count	Spores per m^3	Percent of Total	In/Out		Raw Count	Spores per m^3	Percent of Total	In/Out
Ascospores	3	200	22.2	0.5:1		7	400	28.2	-
Basidiospores	-	-	-	-		1	50	3.5	-
Cladosporium Species	5	300	33.3	1.5:1		3	200	14.1	-
Hyphal Elements	-	-	-	-		-	-	-	-
Myxomycete-Like	-	-	-	-		-	-	-	-
Penicillium/Aspergillus Group	8	400	44.4	0.52:1		15	770	54.2	-
Total	16	900	99%			26	1420	100%	
Debris Rating	3*					3*			
Analytical Sensitivity	51					51			
Sample Volume (L)	65					65			
Lab Sample Number	371725687-0003					371725687-0001			

SAMPLE LOCATION	1407	RESULT	OUTDOOR
CLIENT SAMPLE NUMBER	104047		82398
RESULT	✔ Normal		Control

Spore Identification	Raw Count	Spores per m^3	Percent of Total	In/Out		Raw Count	Spores per m^3	Percent of Total	In/Out
Ascospores	2	100	9.8	0.25:1		7	400	28.2	-
Basidiospores	-	-	-	-		1	50	3.5	-
Cladosporium Species	12	620	60.8	3.1:1		3	200	14.1	-
Hyphal Elements	1	20	0	-		-	-	-	-
Myxomycete-Like	-	-	-	-		-	-	-	-
Penicillium/Aspergillus Group	6	300	29.4	0.39:1		15	770	54.2	-
Total	21	1040	100%			26	1420	100%	
Debris Rating	3*					3*			
Analytical Sensitivity	51					51			
Sample Volume (L)	65					65			
Lab Sample Number	371725687-0004					371725687-0001			

SAMPLE LOCATION	1505	RESULT	OUTDOOR
CLIENT SAMPLE NUMBER	112795		82398
RESULT	✔ Normal		Control

Spore Identification	Raw Count	Spores per m^3	Percent of Total	In/Out		Raw Count	Spores per m^3	Percent of Total	In/Out
Ascospores	1	50	9.1	0.12:1		7	400	28.2	-
Basidiospores	1	50	9.1	1:1		1	50	3.5	-
Cladosporium Species	2	100	18.2	0.5:1		3	200	14.1	-

Hyphal Elements	-	-	-	-		-	-	-	-
Myxomycete-Like	1	50	9.1	-		-	-	-	-
Penicillium/Aspergillus Group	5	300	54.5	0.39:1		15	770	54.2	-
Total	10	550	100%			26	1420	100%	
Debris Rating	2*					3*			
Analytical Sensitivity	51					51			
Sample Volume (L)	65					65			
Lab Sample Number	371725687-0005					371725687-0001			

SAMPLE LOCATION	1506				RESULT	OUTDOOR			
CLIENT SAMPLE NUMBER	112791					82398			
RESULT	✔ Normal					Control			
Spore Identification	Raw Count	Spores per m^3	Percent of Total	In/Out		Raw Count	Spores per m^3	Percent of Total	In/Out
Ascospores	2	100	22.2	0.25:1		7	400	28.2	-
Basidiospores	1	50	11.1	1:1		1	50	3.5	-
Cladosporium Species	-	-	-	-		3	200	14.1	-
Hyphal Elements	-	-	-	-		-	-	-	-
Myxomycete-Like	-	-	-	-		-	-	-	-
Penicillium/Aspergillus Group	5	300	66.7	0.39:1		15	770	54.2	-
Total	8	450	100%			26	1420	100%	
Debris Rating	2*					3*			
Analytical Sensitivity	51					51			
Sample Volume (L)	65					65			
Lab Sample Number	371725687-0006					371725687-0001			

SAMPLE LOCATION	1515				RESULT	OUTDOOR			
CLIENT SAMPLE NUMBER	82394					82398			
RESULT	✔ Normal					Control			
Spore Identification	Raw Count	Spores per m^3	Percent of Total	In/Out		Raw Count	Spores per m^3	Percent of Total	In/Out
Ascospores	4	200	50	0.5:1		7	400	28.2	-
Basidiospores	-	-	-	-		1	50	3.5	-
Cladosporium Species	-	-	-	-		3	200	14.1	-
Hyphal Elements	-	-	-	-		-	-	-	-
Myxomycete-Like	-	-	-	-		-	-	-	-
Penicillium/Aspergillus Group	3	200	50	0.26:1		15	770	54.2	-
Total	7	400	100%			26	1420	100%	

Debris Rating	2*	3*
Analytical Sensitivity	51	51
Sample Volume (L)	65	65
Lab Sample Number	371725687-0007	371725687-0001

SAMPLE LOCATION	1705				RESULT	OUTDOOR			
CLIENT SAMPLE NUMBER	90465					82398			
RESULT	✔ Normal					Control			
Spore Identification	Raw Count	Spores per m^3	Percent of Total	In/Out		Raw Count	Spores per m^3	Percent of Total	In/Out
Ascospores	2	100	20	0.25:1		7	400	28.2	-
Basidiospores	-	-	-	-		1	50	3.5	-
Cladosporium Species	-	-	-	-		3	200	14.1	-
Hyphal Elements	1	20	0	-		-	-	-	-
Myxomycete-Like	-	-	-	-		-	-	-	-
Penicillium/Aspergillus Group	7	400	80	0.52:1		15	770	54.2	-
Total	10	520	100%			26	1420	100%	
Debris Rating	3*					3*			
Analytical Sensitivity	51					51			
Sample Volume (L)	65					65			
Lab Sample Number	371725687-0008					371725687-0001			

FOOTNOTES & ADDITIONAL REPORT INFORMATION

- The results in this analysis pertain only to this sample location(s), collected on the stated date and should not be used in the interpretation of any other sample location(s). This report my not be duplicated, except in full, without the written consent of My Mold Detective, LLC. (MMD)

- High levels of particulate can obscure each other and lead to underestimation. This report and its conclusions relate only to the samples and property history reported above. Neither ACC, MMD, MAD nor the third-party accredited laboratory bear any responsibility for sample collection activities or analytical method limitation. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

- Neither the laboratory nor MMD bear any responsibility for sample collection activities, analytical method limitations, or your use of the test results. Interpretation and use of test results are your (consumer's) responsibility. Any reference to health effects or interpretation of mold levels is strictly the opinion of MMD. In no event, shall MMD or any of its employees be liable for lost profits or any special, incidental or consequential damages arising out of your use of the test results.

- My Mold Detective (MMD) should not be used to verify if remediation activities are successful. Industry standards and some state legislation requires a qualified third-party Indoor Environmental Professional (IEP) to verify if a work area is successfully remediated. Third-party Post Remediation Verification Testing (PRVT) and assessments should always include: 1) onsite visual assessment 2) moisture readings (Rh & moisture content) 3) observations of active moisture intrusions 4) evaluation of remediation contractor's containments 5) analysis of potential cross contamination from work areas to adjacent non-remediated work areas 6) mold sampling as deemed applicable by qualified IEP.

- There are no federal or national standards for the numbers 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 spore sis to help determine whether an abnormal condition exists within the indoor environment and if it does, to help pinpoint the area of contamination. Spore count 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.

DEBRIS RATING TABLE

Minimal (less than 5%) particulate present	1. Reported values are minimally affected by particulate load.
5% to 25% of the trace occluded with particulate	2.
26% to 75% of the trace occluded with particulate	3. Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
76% to 90% of the trace occluded with particulate	4.
Greater than 90% of the trace occluded with particulate	5. Quantification not possible due to large negative bias. New samples should be collected at shorter time interval, or other measures taken to reduce the particulate load.

LEARN ABOUT THE MOLD

Particulate	Definition
ASCOSPORES	Ascospores are the result of sexual reproduction and produced in a saclike structure called an ascus. All ascospores belong to members of the Phylum Ascomycota, which encompasses a plethora of genera worldwide. Allergenic Potential: Depends on genus and species
BASIDIOSPORES	Basidiospores are the result of sexual reproduction and formed on a structure called the basidium. Basidiospores belong to the members of the Phylum Basidiomycota, which includes mushrooms, shelf fungi, rusts, and smuts. Allergenic Potential: Type I allergies (hay fever, asthma) & Type III (hypersensitivity pneumonitis) Potential Toxins Produced: Amanitins, monomethyl-hydrazine, muscarine, ibotenic acid, psilocybin.
CLADOSPORIUM SPECIES	Cladosporium is a fungus known as a mold. It is found worldwide, and often makes up about 50% of airborne spores.
HYPHAL ELEMENTS	Hyphal elements refer to fragments of the filamentous structures (hyphae) that make up the body of molds by branching extensively to form a complex network called mycelium. It is common to find small hyphal fragments in outdoor air and possibly in indoor dust. However, their presence in indoor air samples, if in quantity or in large segments, suggests an active fungal colony in the building. Their presence in a surface sample in quantity or in large segments indicates that active fungal growth is present or nearby, or that fungal material has been disturbed in the building. May be allergenic. Allergenic Potential: Type I allergies (hay fever, asthma). Potential Toxins Produced: Not currently known.
PENICILLIUM/ASPERGILLUS GROUP	Aspergillus is the second most common opportunistic pathogen following Candida. Penicillium is one of the most common genera of fungi. Free spores of Penicillium are indistinguishable from Aspergillus and other genera with small round to oval colorless or slightly pigmented spores. Widespread. Commonly found in house dust. Grows in water damaged buildings on wallpaper, wallpaper glue, decaying fabrics, moist chipboards, and behind paint. Colonies are usually shades of blue, green, and white. Allergenic Potential: Allergic bronchopulmonary aspergillosis (ABPA) which is common in asthmatic and cystic fibrosis patients, Aspergillus sinusitis, Invasive aspergillosis in immunocompromised patients Type I (hay fever, asthma), Type III (hypersensitivity)

Potential Toxins Produced: Aspergillus: 3-Nitropropionic acid, 5-metoxystermatocystin, Aflatoxin B1, B2, Aflatoxin G1, G2, Aflatoxin M1, M2, Aflatoxin P1, Aflatoxin Q1, Aflatoxins, Aflatrem (alkaloid), Aflatrem (indole alkaloid), Aflavinin, Ascalidol, Aspergillic acid, Aspergillomarasmin, Aspertoxin, Asteltoxin, Austamid, Austdiol, Austins, Austocystins, Avenaciolide, Brevianamide A, Candidulin, Citreoviridin,, Citrinin, Clavatol, Cyclopiazonic acid, Cyclopiazonic acid, Cytochalasin E, Emodin, Fumagillin, Fumigaclavine A, Fumigatin, Fumitremorgens, Fumitremorgin A, Gliotoxin, Griseofulvin, Helvolic acid, Kojic acid, Kotanin, Malformins, Naphtopyrones, Neoaspergillic acid, Nidulin, Nidulotoxin, Nigragillin, Ochratoxin A, Ochratoxin B, Ochratoxin C, Ochratoxins ß, Ochratoxins a, Ochratoxins (A,B,C.a, ß.), Orlandin, Oryzacidin, Paspaline, Patulin, Penicillic acid, Phthioic acid, Secalonic acid A, B, D and F, Sphingofungins, Spinulosin, Sterigmatocystin, Terphenyllin, Terredional, Terreic acid, Terrein, Terretonin, Terretonin, Territrem A, Tryptoquivalines, Verruculogen, Versicolorin A, Viomellein, Viriditoxin, Xanthocillin, Xanthomegnin, ß-nitropropionic acid

Penicillium: Citrinin, Citreoviridin, Cyclopiazonic acid, Fumitremorgen B, Grisiofulvin, Janthitrems, Mycophenolic acid, Paxilline, Penitrem A, Penicillic acid, Ochratoxins, Roquefortine C, Secalonic acid D, Verruculogen, Verrucosidin, Viomellein, Viridicatumtoxin, Xanthomegnin,

FOOTNOTES

- Dash (-) in this report, under the raw count column of the Air Sample Results table means 'not detected' (ND): otherwise 'not applicable' (NA).
- The positive-hole correction factor is a statistical tool which calculates a probable count from the raw count, taking into consideration that multiple particles can impact on the same hole; for this reason the sum of calculated counts may be less than the positive hole corrected total.
- Due to rounding totals may not equal 100%.
- Minimum Reporting Limits (MRL) for BULKS, DUSTS, SWABS, and WATER samples are a calculation based on the sample size and the dilution plate on which the organism was counted. Results are a compilation of counts taken from multiple dilutions and multiple medias. This means that every genus of fungi or bacteria recovered can be counted on the plate on which it is best represented.
- If the final quantitative result is corrected for contamination based on the blank correction is stated in the sample comments section of the report.
- Analysis conducted on non-viable spore traps is completed usin the Indoor Environmental Standards Organization Standard 2210.
- The results in this report are related to this project and these samples only.

NORMI®
NATIONAL ORGANIZATION OF REMEDIATORS AND MOLD INSPECTORS

NORMI Sanitization Protocol

When the elevated contaminants are found in an indoor environment but not significant enough to warrant remediation, NORMI recommends a sanitization protocol that includes air filtration/purification, clean surfaces and lifestyle changes. Adapted from "Mold-Free Construction, here is a list of changes than can be made to improve any indoor environment and reduce the contaminants in both the air and on surfaces.

- ☑ Keep the premises clean and regularly dust, vacuum, and mop.
- ☑ Install an air purifier in the home to maintain good indoor air quality and reduce dust. (It important that you consult with an IAQ Specialist so you can take a holistic approach to the myriad of indoor air contaminants that exist. A multi-strategic approach is the most effective way to reduce indoor air pollutants)
- ☑ Use hood vents when cooking, cleaning, and dishwashing.
- ☑ Keep closet doors ajar, where possible, to increase airflow in the closets or install vented doors.
- ☑ Avoid excessive amounts of indoor plants.
- ☑ Use exhaust fans when bathing/showering.
- ☑ Leave exhaust fans on long enough to remove moisture from the room.
- ☑ Use ceiling fans.
- ☑ Water all indoor plants outdoors, if possible.
- ☑ Wipe down any moisture and/or spillage.
- ☑ Wipe down bathroom walls and fixtures after bathing/showering. There are some good products out there for this very purpose.
- ☑ Wipe down any vanities/sink tops.
- ☑ Avoid air drying clothes indoors.
- ☑ Avoid air-drying dishes or by hand.
- ☑ Open blinds/curtains to allow light into premises.
- ☑ Wipe down floors after any water spillage.
- ☑ Hang shower curtains within the bath when showering.
- ☑ Securely close shower doors, if present, when showering.
- ☑ Leave bathroom and showers door open after use.
- ☑ Use dryer if present for wet towels.
- ☑ Use household cleaners (we prefer biodegradable enzyme cleaners and other green technologies) on any hard surfaces.
- ☑ Remove any moldy or rotting food
- ☑ Remove garbage regularly.
- ☑ Wipe down any and all visible signs of moisture.
- ☑ Regularly scan the ceiling for evidence of roof leaks.
- ☑ Periodically check the air conditioning vents to be sure they are clean.
- ☑ Change the air conditioning filter regularly.
- ☑ Perform scheduled maintenance on your air conditioning system, including, but not limited to, cleaning the evaporator coil. (Keep relative humidity between 40%-60%)
- ☑ Wipe down windows and sills if moisture is present.
- ☑ Regularly, inspect for leaks under the sinks and around the base of the water closets, around the washing machine and water heater.
- ☑ Check all washer hoses and outside garden hose connections.
- ☑ Regularly empty dehumidifier.
- ☑ Clean behind the refrigerator and around the air conditioning air handler if possible.
- ☑ Empty the refrigerator condensation pan where possible.
- ☑ If possible, pour a small amount of bleach in the drip pan of the air conditioning air handler to decrease the potential for mold growth.
- ☑ Answer this question regularly and check for the signs of mold: "If I were mold and liked moisture, where would I feel most comfortable to set up a home and build a family?"

Products Clients Have Also Purchased:

This innovative product has taken the 1" filter market by storm because it provides an anti-microbial to reduce bio-nesting making it a true 90 day filter. With its unique internal frame, the filter media extends to the outer edge of the register sealing it and preventing blow-by thus keeping your HVAC system cleaner longer. This filter can be purchased through a subscription process with FREE Shipping on an annual basis so you always have the filters you need.

www.PerfectFitFilter.com

The MCI12K utilizes the trademarked MCI™ Multi-Cluster Ionization to proactively clean the air and surfaces throughout 12,000 cubic feet without producing ozone.

www.MCI12K.com

EnzyMagic™201

Enzymes are nature's cleaning process. Using a proprietary blends of enzymes, this all-purpose cleaner is 100% bio-degradable, water-based and powerful enough to use in laundry, on floors, on carpet and hard surfaces to clean those surfaces and eliminate the odors from odor-causing bacteria and fungal contamination. EnzyMagic201 is a 20:1 concentrate good to use an as all-purpose cleaner in place of those more toxic chemicals that use quaternary disinfectants like ammonium chloride. One quart makes 5 gallons of ready-to-use product.

www.BestLivingSystems.com

**NORMI recommendations are independent and have no affiliation with MMD and MMD partnering laboratories.*

(http://www.normi.org)

LAB ANALYSIS REPORT

MY MOLD DETECTIVE

WWW.MYMOLDDETECTIVE.COM

LAB ANALYSIS REPORT

CONFIRMATION #: 22893

DATE COLLECTED: 11/02/2017 13:58:50

DATE RECEIVED: 11/07/2017 10:00:00

DATE ANALYZED: 11/10/2017 19:46:15

LAB ANALYSIS BY: EMSL ANALYTICAL, INC.

CUSTOMER INFORMATION

NAME: MICHAEL SIRECI

PHONE: 9788442322

EMAIL: MSIRECI@MASSTEACHER.ORG

DATE REPORTED: 11/2/2017 1:58:50 PM

PROPERTY: VISIBLE MOLD, PRIOR WATER DAMAGE, WATER STAINS,

SYMPTOMS:

PROPERTY NAME: BARNSTABLE HIGH SCHOOL

PROPERTY ADDRESS: 744 WEST MAIN STREET, HYANNIS, MA, 02601

PROPERTY TYPE: COMMERCIAL

RELATION: OTHER

OCCUPANTS: COMPLAINTS

SUMMARY

SURFACE SAMPLE

1206 WALL BOARD
SOME SPORE COUNTS APPEAR ELEVATED.

1205 FLOOR
SPORE COUNTS APPEAR NORMAL.

1407 CEILING
SOME SPORE COUNTS APPEAR ELEVATED.

1406 LANDRY CEL
SOME SPORE COUNTS APPEAR ELEVATED.

1409 CEILING
SOME SPORE COUNTS APPEAR ELEVATED.

1506
SOME SPORE COUNTS APPEAR ELEVATED.

1506 FLOOR
SOME SPORE COUNTS APPEAR SLIGHTLY ELEVATED.

1515 ABV WHT BD
SOME SPORE COUNTS APPEAR SLIGHTLY ELEVATED.

1505 CEILING
NO SPORES.

2207 CEILING
NO SPORES.

2723 CEILING
SOME SPORE COUNTS APPEAR ELEVATED.

2210 CEILING
NO SPORES.

DEANS A FLOOR
SPORE COUNTS APPEAR NORMAL.

DEANS A CEILING
SOME SPORE COUNTS APPEAR ELEVATED.

CALL A MYMOLDDETECTIVE ® REPRESENTATIVE NOW TO DISCUSS YOUR RESULTS.

DISCUSS MY LAB REPORT

Thank you for choosing MyMoldDetective®!

MMD'S™ CONCLUSIONS

WE ARE HERE TO HELP! YOUR LAB RESULTS HAVE BEEN REVIEWED BY MYMOLDDETECTIVE'S™ IN-HOUSE INDOOR AIR QUALITY (IAQ) DEPARTMENT AND WE WANT TO BRING A FEW ITEMS TO YOUR ATTENTION:

MMD'S™ MOLD TESTING CONCLUSION: NORMAL

The laboratory data from the non-viable air samples indicates that the types (species) of aerosolized fungal spores presented in the indoor sampling results are Consistent or Typical with the dominant types found in the outdoor reference comparison sample. Simply this means, an occupants' exposure to a variety of airborne fungal spores would have been greater in the outdoor environment than the indoor environment at the time of testing. The samples collected were submitted to an AIHA Accredited and EMLAP certified independent laboratory (Aerobiology Laboratory Associates, Inc.) for microscopic evaluation.

MMD'S™ PROPERTY HISTORY CONCLUSION: ACTION RECOMMENDED

Due to this property's history of **visible mold**, **water damage** and **water stains**, MMD™ and the IAQ Industry recommends you have a local, qualified Indoor AirQuality (IAQ) Professional (i.e. Certified Microbial Remediator - CMR) perform an Onsite Mold Assessment to take a closer look at your property. An Onsite Mold Assessment can result in customized recommendations to safeguard against and eliminate mold contamination.

ONSITE EVALUATION

We have a network of pre-screened, qualified and insured professionals that we will connect you with to help give you a more comprehensive view of your indoor air quality. If you would like MyMoldDetective™ to refer a local professional in your area or have any questions about your Mold Analysis lab

report, please do not hesitate to contact us.

LAB ANALYSIS

SURFACE SAMPLE RESULTS

SAMPLE LOCATION	1206 WALL BOARD
LAB SAMPLE NUMBER	371724651-0001
RESULT	✖ ELEVATED

RESULTS	LABORATORY OBSERVATIONS
NUMEROUS PENICILLIUM/ASPERGILLUS GROUP	>1000 SPORES PER COVER SLIP
NUMEROUS CLADOSPORIUM SPECIES	>1000 SPORES PER COVER SLIP

SAMPLE LOCATION	1205 FLOOR
LAB SAMPLE NUMBER	371724651-0002
RESULT	✔ NORMAL

RESULTS	LABORATORY OBSERVATIONS
BASIDIOSPORES	1-10 SPORES PER COVER SLIP

SAMPLE LOCATION	1407 CEILING
LAB SAMPLE NUMBER	371724651-0003
RESULT	✖ ELEVATED

RESULTS	LABORATORY OBSERVATIONS
NUMEROUS CLADOSPORIUM SPECIES	>1000 SPORES PER COVER SLIP
ULOCLADIUM SPECIES	11 – 100 SPORES PER COVER SLIP

SAMPLE LOCATION	1406 LANDRY CEL
LAB SAMPLE NUMBER	371724651-0004
RESULT	✖ ELEVATED

RESULTS	LABORATORY OBSERVATIONS
PENICILLIUM/ASPERGILLUS GROUP	101 - 1000 SPORES PER COVER SLIP
NUMEROUS STACHYBOTRYS SPECIES	>1000 SPORES PER COVER SLIP

SAMPLE LOCATION	1409 CEILING
LAB SAMPLE NUMBER	371724651-0005
RESULT	✖ ELEVATED

RESULTS	LABORATORY OBSERVATIONS
PENICILLIUM/ASPERGILLUS GROUP	11 – 100 SPORES PER COVER SLIP
NUMEROUS CLADOSPORIUM SPECIES	>1000 SPORES PER COVER SLIP

SAMPLE LOCATION	1506
LAB SAMPLE NUMBER	371724651-0006
RESULT	✖ ELEVATED

RESULTS	LABORATORY OBSERVATIONS
NUMEROUS CLADOSPORIUM SPECIES	>1000 SPORES PER COVER SLIP

SAMPLE LOCATION	1506 FLOOR
LAB SAMPLE NUMBER	371724651-0007
RESULT	! SLIGHTLY ELEVATED

RESULTS	LABORATORY OBSERVATIONS
CLADOSPORIUM SPECIES	101 - 1000 SPORES PER COVER SLIP
MYXOMYCETE-LIKE	1-10 SPORES PER COVER SLIP

SAMPLE LOCATION	1515 ABV WHT BD
LAB SAMPLE NUMBER	371724651-0008
RESULT	! SLIGHTLY ELEVATED

RESULTS	LABORATORY OBSERVATIONS
PENICILLIUM/ASPERGILLUS GROUP	1-10 SPORES PER COVER SLIP
CLADOSPORIUM SPECIES	101 - 1000 SPORES PER COVER SLIP
EPICOCCUM SPECIES	11 - 100 SPORES PER COVER SLIP
MYXOMYCETE-LIKE	1-10 SPORES PER COVER SLIP
PITHOMYCES SPECIES	1-10 SPORES PER COVER SLIP

SAMPLE LOCATION	1505 CEILING
LAB SAMPLE NUMBER	
RESULT	No species found

SAMPLE LOCATION	2207 CEILING
LAB SAMPLE NUMBER	
RESULT	No species found

SAMPLE LOCATION	2723 CEILING
LAB SAMPLE NUMBER	371724651-0011
RESULT	✖ ELEVATED

RESULTS	LABORATORY OBSERVATIONS
NUMEROUS CLADOSPORIUM SPECIES	>1000 SPORES PER COVER SLIP

SAMPLE LOCATION	2210 CEILING
LAB SAMPLE NUMBER	

RESULT	No species found

SAMPLE LOCATION	DEANS A FLOOR
LAB SAMPLE NUMBER	371724651-0013
RESULT	✔ NORMAL

RESULTS	LABORATORY OBSERVATIONS
ASCOSPORES	1-10 SPORES PER COVER SLIP

SAMPLE LOCATION	DEANS A CEILING
LAB SAMPLE NUMBER	371724651-0014
RESULT	✖ ELEVATED

RESULTS	LABORATORY OBSERVATIONS
NUMEROUS PENICILLIUM/ASPERGILLUS GROUP	>1000 SPORES PER COVER SLIP

FOOTNOTES & ADDITIONAL REPORT INFORMATION

A. The results in this analysis pertain only to this sample location(s), collected on the stated date and should not be used in the interpretation of any other sample location(s). This report my not be duplicated, except in full, without the written consent of My Mold Detective, LLC. (MMD)

B. Neither the laboratory nor MMD bear any responsibility for sample collection activities, analytical method limitations, or your use of the test results. Interpretation and use of test results are your (consumer's) responsibility. Any reference to health effects or interpretation of mold levels is strictly the opinion of MMD. In no event, shall MMD or any of its employees be liable for lost profits or any special, incidental or consequential damages arising out of your use of the test results.

Γ. My Mold Detective (MMD) should not be used to verify if remediation activities are successful. Industry standards and some state legislation requires a qualified third-party Indoor Environmental Professional (IEP) to verify if a work area is successfully remediated. Third-party Post Remediation Verification Testing (PRVT) and assessments should always include: 1) onsite visual assessment 2) moisture readings (Rh & moisture content) 3) observations of active moisture intrusions 4) evaluation of remediation contractor's containments 5) analysis of potential cross contamination from work areas to adjacent non-remediated work areas 6) mold sampling as deemed applicable by qualified IEP.

Δ. There are no federal or national standards for the numbers 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 spore sis to help determine whether an abnormal condition exists within the indoor environment and if it does, to help pinpoint the area of contamination. Spore count 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.

DEBRIS RATING TABLE

Minimal (less than 5%) particulate present	Reported values are minimally affected by particulate load.
5% to 25% of the trace occluded with particulate	
26% to 75% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
76% to 90% of the trace occluded with particulate	
Greater than 90% of the trace occluded with particulate	Quantification not possible due to large negative bias. New samples should be collected at shorter time interval, or other measures taken to reduce the particulate load.

LEARN ABOUT THE MOLD

Particulate	Definition
ASCOSPORES	Ascospores are the result of sexual reproduction and produced in a saclike structure called an ascus. All ascospores belong to members of the Phylum Ascomycota, which encompasses a plethora of genera worldwide. **Allergenic Potential:** Depends on genus and species
BASIDIOSPORES	Basidiospores are the result of sexual reproduction and formed on a structure called the basidium. Basidiospores belong to the members of the Phylum Basidiomycota, which includes mushrooms, shelf fungi, rusts, and smuts. **Allergenic Potential:** Type I allergies (hay fever, asthma) & Type III (hypersensitivity pneumonitis) **Potential Toxins Produced:** Amanitins, monomethyl-hydrazine, muscarine, ibotenic acid, psilocybin.
CLADOSPORIUM SPECIES	Cladosporium is a fungus known as a mold. It is found worldwide, and often makes up about 50% of airborne spores.
EPICOCCUM SPECIES	Epicoccum is a fungus that is generally called a mold. This fungus occurs all around the world; it requires a damp environment, and grows best on food substrates containing cellulose, such as paper, or textiles made of cotton, or on insects, and produces single, dry, many-celled, globose, rough-walled, pale brown spores in small cushion-like fructifications called sporodochia. The spores can become airborne and trigger respiratory allergies such as hay fever or asthma in susceptible individuals. Epicoccum is not, however, a disease-causing organism, and is able to grow only on dead organic substrates. It is not a toxin producer.
PENICILLIUM/ASPERGILLUS GROUP	Aspergillus is the second most common opportunistic pathogen following Candida. Penicillium is one of the most common genera of fungi. Free spores of Penicillium are indistinguishable from Aspergillus and other genera with small round to oval colorless or slightly pigmented spores. Widespread. Commonly found in house dust. Grows in water damaged buildings on wallpaper, wallpaper glue, decaying fabrics, moist chipboards, and behind paint. Colonies are usually shades of blue, green, and white. **Allergenic Potential:** Allergic bronchopulmonary aspergillosis (ABPA) which is common in asthmatic and cystic fibrosis patients, Aspergillus sinusitis, Invasive aspergillosis in immunocompromised patients Type I (hay fever, asthma), Type III (hypersensitivity) **Potential Toxins Produced:** Aspergillus: 3-Nitropropionic acid, 5-metoxystermatocystin, Aflatoxin B1, B2, Aflatoxin G1, G2, Aflatoxin M1, M2, Aflatoxin P1, Aflatoxin Q1, Aflatoxins, Aflatrem (alkaloid), Aflatrem (indole alkaloid), Aflavinin, Ascalidol, Aspergillic acid, Aspergillomarasmin, Aspertoxin, Asteltoxin, Austamid, Austdiol, Austins, Austocystins, Avenaciolide, Brevianamide A, Candidulin, Citreoviridin,, Citrinin, Clavatol, Cyclopiazonic acid, Cyclopiazonic acid, Cytochalasin E, Emodin, Fumagillin, Fumigaclavine A, Fumigatin, Fumitremorgens, Fumitremorgin A, Gliotoxin, Griseofulvin, Helvolic acid, Kojic acid, Kotanin, Malformins, Naphtopyrones, Neoaspergillic acid, Nidulin, Nidulotoxin, Nigragillin, Ochratoxin A, Ochratoxin B, Ochratoxin C, Ochratoxins ß, Ochratoxins a, Ochratoxins (A,B,C.a, ß.), Orlandin, Oryzacidin, Paspaline, Patulin, Penicillic acid, Phthioic acid, Secalonic acid A, B, D and F, Sphingofungins, Spinulosin, Sterigmatocystin, Terphenyllin, Terredional, Terreic acid, Terrein, Terretonin, Terretonin, Territrem A, Tryptoquivalines, Verruculogen, Versicolorin A, Viomellein, Viriditoxin, Xanthocillin, Xanthomegnin, ß-nitropropionic acid **Penicillium:** Citrinin, Citreoviridin, Cyclopiazonic acid, Fumitremorgen B, Grisiofulvin, Janthitrems, Mycophenolic acid, Paxilline, Penitrem A, Penicillic acid, Ochratoxins, Roquefortine C, Secalonic acid D, Verruculogen, Verrucosidin, Viomellein, Viridicatumtoxin, Xanthomegnin,
PITHOMYCES SPECIES	Pithomyces is a fungus known as a mold. It is found worldwide, growing on dead leaves of many plants, especially grasses, on soil, and occasionally on paper indoors. It produces dark, multicellular but still microscopic, dry spores which become airborne relatively easily, but usually enter houses from outside. It is not known to be allergenic, and does not cause disease in humans, but produces a toxin called sporidesmin that causes health problems in sheep when they eat grasses on which the mold is producing spores.

Particulate	Definition
STACHYBOTRYS SPECIES	Commonly known as "Black Mold" and found indoors on wet materials containing cellulose, such as wallboard, jute, wicker, straw baskets, and other paper materials. Stachybotrys is slow growing as compared to Penicillium and other common mold genera, and may not compete well in the presence of other fungi. However, when water availability is high for prolonged periods on environmental material, Stachybotrys may gradually become the predominating mold, especially on cellulose containing materials. **Allergenic Potential:** Type I allergies (hay fever, asthma). Type III hypersensitivity pneumonitis: Hot tub lung, Moldy wall hypersensitivity. **Potential Toxins Produced:** Macrocyclic trichothecenes: verrucarin J, roridin E, satratoxin F, G & H, sporidesmin G, trichoverrol; cyclosporins, stachybotryolactone. Stachybotrys mycotoxicosis is currently the subject of toxin research. Stachybotrys mycotoxicosis: human toxicosis has been described; may be characterized by dermatitis, cough, rhinitis, itching or burning sensation in mouth, throat, nasal passages and eyes. The best described toxicoses are from domestic animals that have eaten contaminated hay and straw or inhaled infected material from contaminated bedding. Stachybotrys may play a role in the development of sick building syndrome. The presence of this fungus can be significant due to its ability to produce mycotoxins. Exposure to the toxins can occur through inhalation, ingestion, or skin exposure
ULOCLADIUM SPECIES	Ulocladium is a fungus that is generally called a mold. This fungus occurs all around the world; it requires a damp environment, and grows best on food substrates containing cellulose, such as leaves and paper, or textiles made of cotton. It grows quite commonly in buildings on damp paper (such as that on one side of wallboard). It develops extensive blackish colonies, producing relatively large (though still microscopic), roundish or ellipsoidal dark coloured spores consisting of many cells. These spores can become airborne when disturbed, and this fungus is recognized as an important trigger of allergies such as hay fever or asthma in susceptible individuals. It is not, however, a disease-causing organism, and is able to grow only on dead organic substrates. It is not a toxin producer.

FOOTNOTES

A. Dash (-) in this report, under the raw count column of the Air Sample Results table means 'not detected' (ND): otherwise 'not applicable' (NA).

B. The positive-hole correction factor is a statistical tool which calculates a probable count from the raw count, taking into consideration that multiple particles can impact on the same hole; for this reason the sum of calculated counts may be less than the positive hole corrected total.

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

Δ. Minimum Reporting Limits (MRL) for BULKS, DUSTS, SWABS, and WATER samples are a calculation based on the sample size and the dilution plate on which the organism was counted. Results are a compilation of counts taken from multiple dilutions and multiple medias. This means that every genus of fungi or bacteria recovered can be counted on the plate on which it is best represented.

E. If the final quantitative result is corrected for contamination based on the blank correction is stated in the sample comments section of the report.

Z. Analysis conducted on non-viable spore traps is completed usin the Indoor Environmental Standards Organization Standard 2210.

H. The results in this report are related to this project and these samples only.

DISCLAIMER

This document was designed to follow currently known industry guidelines for the interpretation of microbial sampling and analysis. Since

interpretation of mold analysis reports is a scientific work in progress, it may as such be changed at any time without notice. The client is solely responsible for the use or interpretation. My Mold Detective, LLC makes no express or implied warranties as to health of a property from only the samples sent to their laboratory for analysis. The client is hereby notified that due to the subjective nature or fungal analysis and the mold growth process, laboratory samples can and do change over time relative to the originally sampled material. My Mold Detective, LLC reserves the right to properly dispose of all samples after the testing of such samples is sufficiently completed or after a 7 day period, whichever is greater.

EMSL ANALYTICAL, INC.