Report For
Air Quality and Airborne Mold Testing
At The
Fuller Middle School
Framingham, MA

Study Date:
January 26, 2018

Project# 218 052.00

STUDY CONDUCTED BY:

UNIVERSAL ENVIRONMENTAL CONSULTANTS
12 Brewster Road
Framingham, Massachusetts

UEC universal environmental consultants

January 30, 2018

Mr. Matt Torti
Director of Buildings and Grounds
31 Flagg Drive, Door #6
Framingham, MA 01702

Reference: Air Quality and Airborne Mold Testing
Fuller Middle School, Framingham, MA

Dear Mr. Torti:

Thank you for the opportunity for Universal Environmental Consultants (UEC) to provide professional services.

Enclosed please find the report for Air Quality and Airborne Mold Testing at the Fuller Middle School conducted on Friday, January 26, 2018.

Please do not hesitate to call should you have any questions.

Very truly yours,

Universal Environmental Consultants

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Ammar M. Dieb
President

UEC:\218 052.00\IAQ Report.DOC

Enclosure

1.0 Scope:

UEC was contracted to perform an Air Quality and Airborne Mold Testing at the Fuller Middle School, Framingham, MA.

Testing was performed on Friday, January 26, 2018.

2.0 Methodology:

Air testing was conducted for the following. The sample length at each test location was 2 minutes.

- Total Volatile Organic Compounds (***TVOCs***).
- Carbon Dioxide (***CO_2***), Carbon monoxide (***CO***), Temperature (***˚F***) and Relative Humidity (***RH %***).
- ***PM*** (Particulate matter) - ***PM_{10}*** (particles less than 10 micrometers in diameter) and ***$PM_{2.5}$*** (particles less than 2.5 micrometers in diameter).[1]
- Airborne Mold Testing.

Testing for ***TVOCs*** referenced to isobutylene was performed using a Rae Systems ppbRae3000 Photo-Ionization Detector (PID) model PGM7340 equipped with a 10.6 eV lamp (S/N 594-903008). This is a state of the art instrument capable of detecting total ***TVOCs*** in the parts per billion (ppb) range. The instrument is a direct reading monitor and provided sampling readings at 1 second intervals over the duration of each test. The instrument was calibrated prior to testing and is serviced annually by the manufacturer or an independent vendor.

TVOCs are a broad class of chemicals with diverse applications which are frequently emitted by new carpets, furniture, pressboards, varnishes, adhesives and high gloss finishes. Other common products which may emit ***TVOCs*** include paints, paint strippers, other solvents, wood preservatives, aerosol sprays, cleansers, disinfectants, moth repellents, air fresheners, stored chemicals and fuels, automotive products, hobby supplies, and dry-cleaned clothing. Elevated levels of ***TVOCs*** are a common IAQ problem, especially in newly constructed buildings.

Carbon Dioxide (***CO_2***), Carbon monoxide (***CO***), Temperature (***˚F***) and Relative Humidity (***RH %***) were measured using a TSI Corporation Q-Trak 7575 (S/N 7575X1337003) with a 982 probe (S/N P13350004). The instrument is a direct reading monitor that utilizes infrared technology to measure ***CO_2*** and an electro-chemical cell to measure ***CO*** and provided sampling readings at 1 second intervals over the duration of each test. The instrument was calibrated prior to testing and is serviced annually by the manufacturer or an independent vendor.

CO_2 is a useful measure of ventilation effectiveness in spaces occupied by people (i.e. verification that sufficient fresh air is being introduced into the occupied space being tested). Indoor ***CO*** levels were measured comparatively with outside levels to verify whether sources such as boiler and vehicle exhausts were causing elevated indoor ***CO*** levels. ***CO_2*** and ***CO*** were measured in parts per million (ppm). Temperature and relative humidity readings were taken to verify indoor levels were within ASHRAE[2] comfort ranges.

Airborne particulate matter (***PM***) levels for ***PM_{10}*** and ***$PM_{2.5}$*** were tested using a TSI Corporation DustTrak DRX 8534 handheld aerosol monitor (S/N 8534124302). This is a state of the art instrument capable of

[1] **Fine particles ($PM_{2.5}$) -** Particles less than 2.5 micrometers in diameter are called "fine" particles. Sources of fine particles include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. **Coarse particles -** Particles between 2.5 and 10 micrometers in diameter are referred to as "coarse." Sources of coarse particles include crushing or grinding operations, and dust stirred up by vehicles traveling on roads.

[2] ASHRAE = American Society of Heating, Refrigeration and Air-conditioning Engineers.

simultaneously detecting PM_{10} and $PM_{2.5}$ in the microgram per cubic meter ($\mu g/m^3$) range. The instrument is a direct reading monitor and provided sampling readings at 1 second intervals over the duration of each test. The instrument was zeroed prior to testing and is serviced annually by the manufacturer or an independent vendor.

Real time ***PM*** Measurement is a useful comparative measure of indoor and outdoor dust levels as well as identifying indoor sources of ***PM***.

Airborne mold testing was performed utilizing Zefon International Incorporated's Air-O-Cell® sampling device following all manufacturer supplied recommended sampling procedures.

The Air-O-Cell® is a direct read total particulate air sampling device. It works using the inertial impaction principle similar to other spore trap devices. It is designed for the rapid collection and analysis of airborne particulate including bioaerosols. The particulate includes fibers (e.g. asbestos, fiberglass, cellulose, clothing fibers) opaque particles (e.g. fly ash, combustion particles, copy toner, oil droplets, paint), and bioaerosols (e.g. mold spores, pollen, insect parts, skin cell fragments).[3]

The method involves drawing a known quantity of air through a sterile sampling cassette. Subsequent to sampling, the cassette is sealed and transferred to a microbiology laboratory under chain of custody protocol for microscopic analysis. This method counts both viable and nonviable mold spores.

Samples were analyzed by Environmental Protection Agency (EPA) approved and credited laboratory EMSL.

Samples results are attached.

[3] Zefon International Inc. <www.zefon.com>

3.0 Results:

TEMPERATURE, RELATIVE HUMIDITY, CARBON MONOXIDE, CARBON DIOXIDE & TOTAL VOLATILE ORGANIC COMPOUNDS by PID
09:00 AM

Location	W	D	#	Temperature (°F)	Humidity %RH	CO (ppm)	CO_2 (ppm)	TVOCs ($\mu g/m^3$)
Outside	-	-	-	26.4	25.7	0.0	433	0
Main Office	C	C	8	70.7	41.8	0.0	742	135
D37	C	C	0	67.9	25.9	0.0	630	0
Cafeteria	C	O	2	67.8	19.2	0.0	591	43
Fitness Center	C	C	14	67.3	9.3	0.0	493	0
Gymnasium	C	C	1	66.4	17.5	0.0	528	0
Nurse	-	C	0	69.2	19.4	0.0	639	142
Auditorium	-	C	0	67.4	14.2	0.0	482	0
C13 Music	-	C	13	67.8	20.6	0.0	833	18
C10	C	C	11	69.5	17.6	0.0	1,099	246
C3 Teachers	C	C	0	71.7	17.2	0.0	801	248
B31	C	O	1	71.7	11.4	0.0	774	126
Library	C	O	1	73.1	23.1	0.0	678	39
B42	C	C	0	71.1	12.0	0.0	857	142
B48	C	C	16	70.6	15.6	0.0	935	276
B2	C	C	4	73.7	13.3	0.0	803	188
B9	C	C	0	71.0	37.0	0.0	581	0
A12	-	C	1	70.0	18.2	0.0	698	190
B17	C	C	19	73.6	16.0	0.0	1,273	453
A7A	C	C	2	70.4	9.9	0.0	571	285

***Total PM - PM_{10}*, Respirable, $PM_{2.5}$ and PM1**
09:00 AM

Location	Total PM	PM 10 (mg/m^3)	Respirable (mg/m^3)	PM 2.5 (mg/m^3)	PM1 (mg/m^3)
Main Office	0.141	0.039	0.007	0.004	0.003
D37	0.021	0.005	0.002	0.001	0.001
Cafeteria	0.021	0.005	0.002	0.002	0.001
Fitness Center	0.007	0.002	0.001	0.000	0.000
Gymnasium	0.021	0.003	0.001	0.001	0.000
Nurse	0.009	0.002	0.001	0.000	0.000
Auditorium	0.002	0.001	0.000	0.000	0.000
C13 Music	0.037	0.007	0.002	0.001	0.001
C10	0.035	0.005	0.002	0.002	0.001
C3 Teachers	0.101	0.038	0.006	0.003	0.003
B31	0.002	0.001	0.000	0.000	0.000
Library	0.028	0.007	0.002	0.001	0.001
B42	0.004	0.001	0.000	0.000	0.000
B48	0.041	0.008	0.002	0.002	0.002

B2	0.070	0.018	0.004	0.002	0.002
B9	0.004	0.001	0.000	0.000	0.000
A12	0.008	0.003	0.002	0.002	0.002
B17	0.097	0.033	0.011	0.009	0.008
A7A	0.010	0.004	0.001	0.001	0.001

TEMPERATURE, RELATIVE HUMIDITY, CARBON MONOXIDE, CARBON DIOXIDE & TOTAL VOLATILE ORGANIC COMPOUNDS by PID

1:00 PM

Location	W	D	#	Temperature (°F)	Humidity %RH	CO (ppm)	CO_2 (ppm)	TVOCs ($\mu g/m^3$)
Outside	-	-	-	32.6	18.6	0.0	429	0
B2	O	C	4	72.0	14.4	0.0	593	18
B48	C	C	5	70.8	18.4	0.0	1,165	209
B42	C	O	1	68.6	15.5	0.0	1,081	133
Library	C	O	1	73.2	27.6	0.0	647	16
Main Office	C	C	6	73.1	42.3	0.0	750	46
D37	C	O	0	73.1	23.7	0.0	687	34
Cafeteria	C	C	2	70.0	22.7	0.0	937	333
Fitness Center	C	C	18	67.9	13.6	0.0	666	0
Gymnasium	C	C	7	66.7	20.8	0.0	753	0
Nurse	-	O	2	70.4	23.3	0.0	830	264
Auditorium	C	C	0	68.2	13.8	0.0	496	0
C13 Music	-	C	0	67.8	18.1	0.0	503	0
C11	C	O	0	68.4	24.0	0.0	1,587	156
C3 Teachers	C	C	6	73.1	22.2	0.0	1,259	356
B31	C	C	0	69.3	15.2	0.0	1,038	31
B17	O	C	23	78.0	17.1	0.0	1,176	211
B9	C	C	0	75.0	13.6	0.0	504	0
A12	-	C	24	71.1	23.4	0.0	1,313	257
A7A	C	C	1	71.8	10.2	0.0	587	101

***Total PM - PM_{10}*, Respirable, *$PM_{2.5}$* and PM1**

1:00 PM

Location	Total PM	PM 10 (mg/m^3)	Respirable (mg/m^3)	PM 2.5 (mg/m^3)	PM1 (mg/m^3)
B2	0.058	0.014	0.003	0.003	0.002
B48	0.016	0.003	0.001	0.001	0.001
B42	0.012	0.003	0.001	0.001	0.001
Library	0.015	0.006	0.001	0.001	0.000
Main Office	0.097	0.029	0.005	0.003	0.002
D37	0.009	0.003	0.001	0.001	0.000
Cafeteria	0.021	0.011	0.006	0.005	0.004
Fitness Center	0.037	0.005	0.002	0.001	0.001
Gymnasium	0.032	0.006	0.002	0.001	0.001
Nurse	0.031	0.006	0.002	0.001	0.001

Auditorium	0.000	0.000	0.000	0.000	0.000
C13 Music	0.000	0.000	0.000	0.000	0.000
C11	0.063	0.023	0.005	0.003	0.003
C3 Teachers	0.105	0.040	0.008	0.005	0.004
B31	0.019	0.005	0.002	0.001	0.001
B17	0.070	0.022	0.006	0.004	0.004
B9	0.003	0.001	0.000	0.000	0.000
A12	0.028	0.005	0.003	0.001	0.001
A7A	0.006	0.002	0.001	0.000	0.000

AIRBORNE MOLD and PARTICULATE

Lab ID #	Location	Total Mold Counts/M^3	Pollen	Insect Fragment	Hyphal Fragments
131800564-0001	B2	20	ND	ND	ND
131800564-0002	B48	7	ND	ND	ND
131800564-0003	B42	ND	ND	ND	ND
131800564-0004	Library	40	ND	ND	ND
131800564-0005	Main Office	47	ND	ND	ND
131800564-0006	D31	ND	ND	ND	ND
131800564-0007	Cafeteria	20	ND	ND	ND
131800564-0008	Fitness Center	ND	ND	ND	ND
131800564-0009	Auditorium	7	ND	ND	ND
131800564-0010	Gymnasium	27	ND	ND	ND
131800564-0011	C13 Music	ND	ND	ND	ND
131800564-0012	Nurse	7	ND	ND	ND
131800564-0013	C11	2	ND	ND	ND
131800564-0014	C3 Teachers	40	ND	ND	ND
131800564-0015	B30	ND	ND	ND	ND
131800564-0016	B17	20	ND	ND	ND
131800564-0017	B9	60	ND	ND	ND
131800564-0018	A12	20	ND	ND	ND
131800564-0019	A7A	7	ND	ND	ND
131800564-0020	Outside	20	ND	ND	ND

AIRBORNE MOLD and PARTICULATE
(Subjective Scales)

Lab ID #	Location	Skin Fragment Density (SFD)	Fibrous Particulates (FP)	Total Background Particulate (TBP)
131800564-0001	Administration Office	3	1	3
131800564-0002	Data Analyst Office	2	1	3

Lab ID #	Location	Skin Fragment Density (SFD)	Fibrous Particulates (FP)	Total Background Particulate (TBP)
131800564-0001	B2	2	1	3
131800564-0002	B48	2	1	3
131800564-0003	B42	2	1	2
131800564-0004	Library	2	1	3
131800564-0005	Main Office	3	1	3
131800564-0006	D31	2	1	2
131800564-0007	Cafeteria	3	1	3
131800564-0008	Fitness Center	1	1	2
131800564-0009	Auditorium	1	1	2
131800564-0010	Gymnasium	3	1	3
131800564-0011	C13 Music	1	1	2
131800564-0012	Nurse	2	1	2
131800564-0013	C11	3	1	3
131800564-0014	C3 Teachers	3	1	4
131800564-0015	B30	2	1	2
131800564-0016	B17	2	1	2
131800564-0017	B9	1	1	2
131800564-0018	A12	3	1	3
131800564-0019	A7A	2	1	3
131800564-0020	Outside	1	1	2

Legend:

W: Windows; D; Doors; # Number of Occupants (e.g. 25 Occupants = 25); O = Open; C = Closed;
mg/m^3- milligrams per cubic meter
$\mu g/m^3$ - micrograms per cubic meter
ppm - parts per million;
ppb - parts per billion;
CO OSHA PEL is 30 ppm and ACGIH TLV is 25 ppm;
CO_2 - OSHA PEL is 5000 ppm, Mass DOH Guideline is 800 ppm;
TVOC – Seifert "Target Guideline Value" of 0.3-mg/m^3

4.0 Observations and Interpretation of Results:

9:00AM:

Temperature and Relative Humidity (T & RH):

The outside temperature and relative humidity were approximately 26.4ºF and 25.7%. Massachusetts Department of Public Health (MDPH) recommends that indoor air temperatures be maintained in a range of 70 - 78 ºF and 40 to 60 % for indoor air relative humidity in order to provide for the comfort of building occupants.

Interior temperature and relative humidity were 66.4 – 73.6ºF and 9.9 – 41.8 % during the test period. Interior temperature tests were mostly within the MDPH recommended temperature range of 70 - 78 ºF. Interior relative humidity test were below the MDPH recommended relative humidity range of 40 to 60 %.

TVOCs:

TVOC levels on this day were mostly lower than the Seifert "Target Guideline Value" of 300-µg/m^3 (0.3 mg/m^3). ***TVOC*** level at Room B17 (0.453 mg/m^3) was found to exceed the Seifert recommended level. The Seifert Target Guideline Value (reference #3 and #8 below) is a widely recognized ***TVOCs*** guideline for pollutant levels based on Seifert's personal judgment, rather than on toxicological data, for long term exposure. Seifert proposed that 1 week after completion of construction or renovation ***TVOC*** concentration of 50 times higher be acceptable (i.e. 15 mg/m^3) and after 6 weeks, 10 times higher be acceptable (i.e. 3 mg/m^3). ***TVOCs*** test levels were between 0.0 and 0.453 mg/m^3, mostly lower than the Seifert target guideline of 0.3 mg/m^3, and much lower than the 1-week and 6-week post-construction/renovation acceptable limits of 15 mg/m^3 and 3 mg/m^3.

Neither OSHA (Occupational Safety and Health Administration) nor ACGIH (American Conference of Governmental Industrial Hygienists) promulgates exposure standards for ***TVOCs*** that relate to protection of the general population as opposed to industrial occupational standards. Both have limits on individual VOCs but they relate to industrial occupational standard.

The testing conducted was of short duration and did not assess representative full-day occupancy levels. Measurements were made using a real-time, portable ***TVOC*** monitor referenced to isobutylene and not by sample collection for individual VOC analysis by gas chromatography technique and evaluation based on Seifert's chemical classes.

Mølhave of Denmark reported at INDOOR AIR '90 (reference #8 below) on low levels of indoor air VOCs and human health. Bearg summarized Mølhave's findings as follows.

Table 4.5 Tentative Dose-Response Relationship for Discomfort Resulting from Exposure to Solvent-Like VOCs

Total concentration (mg/m^3)	Irritation and discomfort	Exposure
< 0.20	No irritation or discomfort	The comfort range
0.20 - 3.0	Irritation and discomfort possible if other exposures interact	The multifactorial exposure range
3.0 – 25	Exposure effect and probable headache possible if other exposures interact	The discomfort range
> 25	Additional neurotoxic effects other than headache may occur	The toxic range

Bearg points out that the overlap between Seifert's and Mølhave's recommendations could be interpreted as a consensus on recommendations for guideline values.

TVOC level at Room B17 is mostly due to the presence of aerosol sprays, cleansers, disinfectants or air fresheners.

Carbon Monoxide:
No ***CO*** levels were detected during testing.

Carbon Dioxide:
CO_2 levels were mostly lower than acceptable range. ***CO_2*** levels at Room C10 (1,099ppm) and Room B17 (1,273 ppm) were found to exceed the MDPH recommended level. For comparative purposes, fresh outdoor air has approximately 433 ppm of ***CO_2***. All areas were well below the OSHA/NIOSH limit of 5,000 ppm and mostly lower than the MDPH guideline of 800 ppm for publicly occupied buildings. MDPH recommends an optimal level of below 600 ppm. Exposure to high levels of ***CO_2*** for prolonged periods could cause building occupants to become lethargic and generally uncomfortable. ***CO_2*** levels will rise over the course of the day especially in those areas which have a high occupancy. ***CO_2*** at these levels are a comfort as opposed to a health issue.

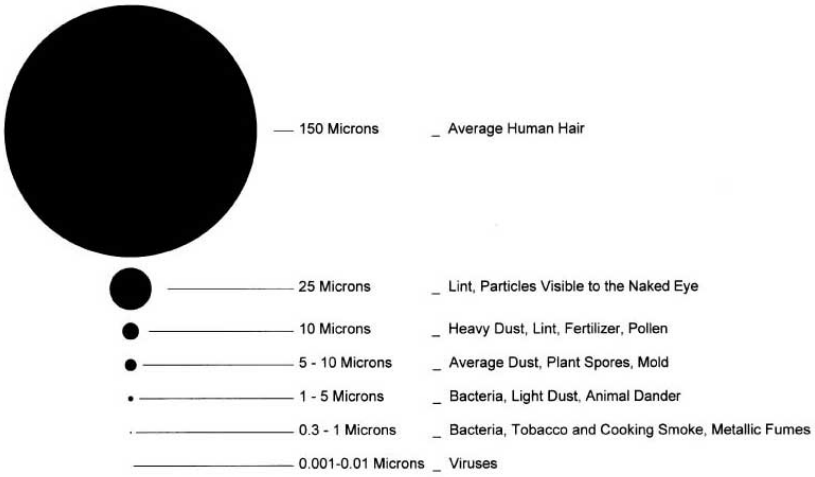
Airborne Particulate Matter:
Dust monitoring is one aspect of air quality that an industrial hygienist can use to determine the amount of dust particles present in the workplace, cities or communities over a given period of time.

The Particulate Matter (PM) monitoring focused on measuring a range of particulate sizes in the air that are equal to or less than 10 micrometers (PM10) and equal to or less than 2.5 micrometers (PM2.5) in diameter (course dust and fine dust respectively), i.e. PM capable of penetrating the outer defenses of the respiratory tract, such as the mouth and nose, and can pass into the lungs based on PM size. PM air pollutants include but are not limited to soot, smoke, salts, metals, acids and soil and road dust. These pollutants are typically monitored along work site fence lines, industrial complexes, during wildfires, and high traffic areas (vehicle exhaust).

EPA's health-based National Ambient Air Quality Standard (NAAQS) for PM10 is 150-$\mu g/m^3$ and for PM2.5 is 35-$\mu g/m^3$ (measured as a 24hr period concentration) for outdoor (ambient) air. The OSHA Permissible Exposure Limit (PEL) for occupational exposure for respirable dust is 5-mg/m^3 (5,000-$\mu g/m^3$) for a time-weighted average (8 hour) exposure. While the EPA NAAQS is an outdoor, ambient air standard, it is a useful reference guide for acceptable air quality in general with limits far below OSHA worker compliance requirement levels.

The TSI DustTrak DRX 8534 real-time PM monitor used in this survey is able to measure PM simultaneously as PM10, PMresp, PM2.5 and PM1, i.e. particles in the size range categories of 10, Respirable (4), 2.5 and 1 micrometer diameter.

Figure 1.1-Visual Particle Size Comparison Chart.



Indoor levels of PM10 recorded in areas tested during the survey ranged from **1 to 39-µg/m^3**.

Indoor level of PMresp (respirable dust) recorded in areas tested during the survey was **1 to 11-µg/m^3**.

Indoor level of PM2.5 recorded in areas tested during the survey was **1 to 9-ug/m^3**.

The airborne Particulate Matter (PM) levels were significantly lower than the EPA National Ambient Air Quality Standards (NAAQS) limits during the test period of **150-µg/m^3** for PM10, **5,000-µg/m^3**for PM respirable and **35-µg/m^3**for PM2.5.

Direct reading PM monitors are not a reference method for OSHA compliance Respirable Dust testing. However, the direct reading instrument is useful in providing accurate order of magnitude evaluation of Respirable Dust levels.

1:00PM:

Temperature and Relative Humidity (T & RH):

The outside temperature and relative humidity were approximately 32.6ºF and 18.6%. Massachusetts Department of Public Health (MDPH) recommends that indoor air temperatures be maintained in a range of 70 - 78 ºF and 40 to 60 % for indoor air relative humidity in order to provide for the comfort of building occupants.

Interior temperature and relative humidity were 66.7 – 78.0ºF and 10.2 – 42.3 % during the test period. Interior temperature tests were mostly within the MDPH recommended temperature range of 70 - 78 ºF. Interior relative humidity test were below the MDPH recommended relative humidity range of 40 to 60 %.

TVOCs:

TVOC levels on this day were mostly lower than the Seifert "Target Guideline Value" of300-µg/m^3 (0.3 mg/m^3). ***TVOC*** levels at the Cafeteria (0.333 mg/m^3) and Room C3 (0.356 mg/m^3) were found to exceed the Seifert recommended level. The Seifert Target Guideline Value (reference #3 and #8 below) is a widely recognized ***TVOCs*** guideline for pollutant levels based on Seifert's personal judgment, rather than on toxicological data, for long term exposure. Seifert proposed that 1 week after completion of construction or renovation ***TVOC*** concentration of 50 times higher be acceptable (i.e. 15 mg/m^3) and after 6 weeks, 10 times higher be acceptable (i.e. 3 mg/m^3). ***TVOCs*** test levels were between 0.0 and 0.356 mg/m^3, mostly lower than the Seifert target guideline of 0.3 mg/m^3, and lower than the 1-week and 6-week post-construction/renovation acceptable limits of 15 mg/m^3 and 3 mg/m^3.

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Bearg points out that the overlap between Seifert's and Mølhave's recommendations could be interpreted as a consensus on recommendations for guideline values.

TVOC levels at the Cafeteria and Room C3 are mostly due to the presence of aerosol sprays, cleansers, disinfectants or air fresheners.

Carbon Monoxide:
No ***CO*** levels were detected during testing.

Carbon Dioxide:
CO_2 levels were mostly lower than acceptable range. ***CO_2*** levels at Room B48 (1,165ppm), Room B42 (1,081ppm), Cafeteria (967ppm), Nurse (830ppm), Room C11 (1,587ppm), Room C3 (1,259ppm), Room B31 (1,038ppm), Room B17 (1,176ppm) and Room A12 (1,313ppm) were found to exceed the MDPH recommended level. For comparative purposes, fresh outdoor air has approximately 433 ppm of ***CO_2***. All areas were well below the OSHA/NIOSH limit of 5,000 ppm and mostly lower than the MDPH guideline of 800 ppm for publicly occupied buildings. MDPH recommends an optimal level of below 600 ppm. Exposure to high levels of ***CO_2*** for prolonged periods could cause building occupants to become lethargic and generally uncomfortable. ***CO_2*** levels will rise over the course of the day especially in those areas which have a high occupancy. ***CO_2*** at these levels are a comfort as opposed to a health issue.

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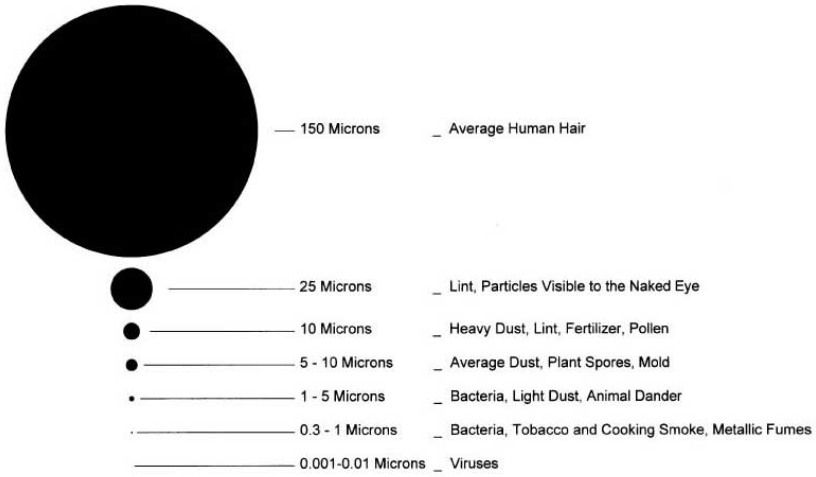
Dust monitoring is one aspect of air quality that an industrial hygienist can use to determine the amount of dust particles present in the workplace, cities or communities over a given period of time.

The Particulate Matter (PM) monitoring focused on measuring a range of particulate sizes in the air that are equal to or less than 10 micrometers (PM10) and equal to or less than 2.5 micrometers (PM2.5) in diameter (course dust and fine dust respectively), i.e. PM capable of penetrating the outer defenses of the respiratory tract, such as the mouth and nose, and can pass into the lungs based on PM size. PM air pollutants include but are not limited to soot, smoke, salts, metals, acids and soil and road dust. These pollutants are typically monitored along work site fence lines, industrial complexes, during wildfires, and high traffic areas (vehicle exhaust).

EPA's health-based National Ambient Air Quality Standard (NAAQS) for PM10 is 150-µg/m^3 and for PM2.5 is 35-µg/m^3 (measured as a 24hr period concentration) for outdoor (ambient) air. The OSHA Permissible Exposure Limit (PEL) for occupational exposure for respirable dust is 5-mg/m^3 (5,000-µg/m^3) for a time-weighted average (8 hour) exposure. While the EPA NAAQS is an outdoor, ambient air standard, it is a useful reference guide for acceptable air quality in general with limits far below OSHA worker compliance requirement levels.

The TSI DustTrak DRX 8534 real-time PM monitor used in this survey is able to measure PM simultaneously as PM10, PMresp, PM2.5 and PM1, i.e. particles in the size range categories of 10, Respirable (4), 2.5 and 1 micrometer diameter.

Figure 1.1-Visual Particle Size Comparison Chart.



Indoor levels of PM10 recorded in areas tested during the survey ranged from **1 to 40-µg/m^3**.

Indoor level of PMresp (respirable dust) recorded in areas tested during the survey was **1 to 8-µg/m^3**.

Indoor level of PM2.5 recorded in areas tested during the survey was **1 to 5-ug/m^3**.

The airborne Particulate Matter (PM) levels were significantly lower than the EPA National Ambient Air Quality Standards (NAAQS) limits during the test period of **150-µg/m^3** for PM10, **5,000-µg/m^3**for PM respirable and **35-µg/m^3**for PM2.5.

Direct reading PM monitors are not a reference method for OSHA compliance Respirable Dust testing. However, the direct reading instrument is useful in providing accurate order of magnitude evaluation of Respirable Dust levels.

Airborne Mold:

There are currently no guidelines or standards promulgated by a government agency or widely recognized scientific organizations for the interpretation of airborne mold spore levels. The most commonly employed tool used to assess if mold growth is occurring and there is amplification in a structure is to evaluate the indoor levels and species as well as to compare levels and species of mold outdoors to indoors. Typically, if there were more molds indoors, and/or if species were present indoors which were not present outdoors, then growth and amplification is likely occurring and further evaluation and perhaps remediation is recommended.

Indoor airborne mold spore concentrations were either lower or slightly higher than the outside sample. Based on comparisons with historical data from projects of similar type, building utilization, geographic location and season, breathing zone indoor airborne levels are considered very low. Indoor mold spore counts in the winter are typically in the 500-1,500 spores/cubic meter range.

Breathing zone indoor samples indicated the presence of several common types of mold which are not considered to be hazardous and were also found outside.

Pollen, insect fragments and Hyphal fragments were either very low or not present in the samples. Hyphal fragment is a non-reproductive part of the mold.

Total background particulate on all samples was assessed as "1-4" on a scale of 1 - 5 where 1 is low and 5 is high. Skin fragment density on all samples was assessed as "1-3" on a scale where 1 is low and 4 is high. The total background levels are measured to determine airborne dust not related to airborne mold. Skin fragments are measured to determine proper housing cleaning.

5.0 Conclusions and Recommendations:

Most IAQ parameters tested were within the acceptable ranges. Relative humidity test were lower than the MDPH recommended relative humidity range of 40 to 60 %. ***CO_2*** levels at few areas were higher than recommended level. It is recommended that the Air Handling Units (AHUs) are continuously checked to insure that the AHUs are pulling insufficient volumes of fresh air. It is also recommended that windows are opened during lunch break to introduce fresh air.

Testing for airborne mold indicates normal background levels. Also, no visual mold growth was observed during testing.

6.0 Limitations and Conditions:

This report has been completed based on visual and physical observations made and information available at the time of the site visits. This report is intended to be used as a summary of available information on existing conditions with conclusions based on a reasonable and knowledgeable review of evidence found in accordance with normally accepted industry standards, state and federal protocols, and within the scope and budget established by the client. Any additional data obtained by further review must be reviewed by UEC and the conclusions presented herein may be modified accordingly.

This report and attachments, prepared for the exclusive use of Owner for use in an environmental evaluation of the subject site, are an integral part of the inspections and opinions should not be formulated without reading the report in its entirety. No part of this report may be altered, used, copied or relied upon without prior written permission from UEC, except that this report may be conveyed in its entirety to parties associated with Owner for this subject study.

REFERENCES:

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3. Seifert, B. Regulation Indoor Air. In: Indoor Air '90, Proceedings of the 5th International Conference on Indoor Air Quality and Climate, Volume V, p. 35. Toronto1990.
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5. BOCA, 1993. The BOCA National Mechanical Code 1993 8th edition Building Officials and Code Administrators International., Inc., Country Club Hills, Ill
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7. Field Guide for the Determination of Biological Contaminants in Environmental Samples. (2005)
8. Bearg, David W. Indoor Air Quality and HVAC Systems. (1993). Pages 76, 77 and others.

OrderID: 131800564

131800564

UEC universal environmental consultants
12 Brewster Road
Framingham, MA 01702
Phone: 508.628.5486
Fax: 508.628.5488

CHAIN OF CUSTODY

BUILDING / SITE NAME: Fuller School
WORK AREA:
TOWN / CITY: Framingham
STATE: MA

Analysis Type	Turnaround Time (x) 6-8 Hr	12 Hr	24 Hr	48 Hr	72 hr
TEM / AHERA					
TEM / Level II					
TEM / Dust					
TEM / Bulk					
TEM / Water					
PLM					
Mold			X		
Other:					

Specific Project Notes

SAMPLE ID	MATERIAL DESCRIPTION	SAMPLE LOCATION	START	STOP	TIME	L/MIN	VOLUME
1	25534754	B2	1041	1051	10	15	150
2	25534769	B48	1043	1053	10	15	150
3	25534795	B42	1052	1102	10	15	150
4	2553 4757	Library	1055	1105	10	15	150
5	25534726	main office	1104	1114	10	15	150
6	25534750	D31	1107	1117	10	15	150
7	2553 5075	Cafeteria	1115	1125	10	15	150
8	2553 5068	Fitness Center	1119	1129	10	15	150
9	2553 5081	Auditorium	1126	1136	10	15	150
10	2553 5086	Gym	1131	1141	10	15	150
11	2553 4761	C13 music	1137	1147	10	15	150
12	2553 5062	nurse	1142	1152	10	15	150
13	2553A806	C11	1149	1159	10	15	150
14	2553 4776	C3 Teachers	1154	1204	10	15	150
15	25318598	B30	1200	1210	10	15	150
16	2553 4775	B17	1205	1215	10	15	150
17	25534737	B9	1212	1222	10	15	150
18	2553 4771	A12	1217	1227	10	15	150
19	2 553 4802	A7A	1224	1234	10	15	150
20	25317859	outside	1229	1239	10	15	150

SAMPLED BY:	DATE/TIME:	RECEIVED BY:	DATE/TIME:
Jason Bewtie	1-26-18		
RELINQUISHED BY:	DATE/TIME:	RECEIVED IN LAB BY:	DATE/TIME:

REC'D 17:25 EST
EMSL-BOSTON JAN 26 2018
VI

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Universal Environmental Consultants
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Framingham, MA 01702

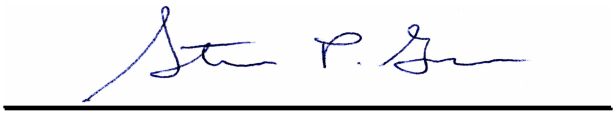
Project: Fuller School - Framingham, MA

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected: 01/26/2018
Received: 01/26/2018
Analyzed: 01/29/2018

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	131800564-0001			131800564-0002			131800564-0003		
Client Sample ID:	1-25534754			2-25534769			3-25534795		
Volume (L):	150			150			150		
Sample Location	B2			B48			B42		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	1	20	100	-	-	-	-	-	-
Basidiospores	-	-	-	-	-	-	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	1*	7*	100	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Spegazzinia	-	-	-	-	-	-	-	-	-
Total Fungi	**1**	**20**	**100**	**1**	**7**	**100**	**-**	**None Detect**	**-**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	22	-	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	3	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	3	-	-	3	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



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

Samples analyzed by EMSL Analytical, Inc. Woburn, MA AIHA-LAP, LLC --EMLAP Accredited #180179

Initial report from: 01/29/2018 14:37:15

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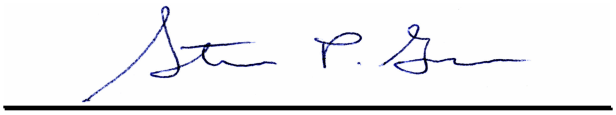
Fax: (508) 628-5488
Collected: 01/26/2018
Received: 01/26/2018
Analyzed: 01/29/2018

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	131800564-0004			131800564-0005			131800564-0006		
Client Sample ID:	4-25534757			5-25534726			6-25534750		
Volume (L):	150			150			150		
Sample Location	Library			Main Office			D31		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	2	40	100	-	-	-	-	-	-
Basidiospores	-	-	-	-	-	-	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	2	40	85.1	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	1*	7*	14.9	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Spegazzinia	-	-	-	-	-	-	-	-	-
Total Fungi	**2**	**40**	**100**	**3**	**47**	**100**	**-**	**None Detect**	**-**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	22	-	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	3	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	3	-	-	3	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



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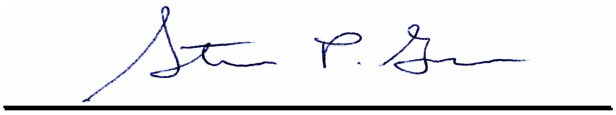
Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	131800564-0007			131800564-0008			131800564-0009		
Client Sample ID:	7-25535075			8-25535068			9-255350801		
Volume (L):	150			150			150		
Sample Location	Cafeteria			Fitness Center			Auditorium		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	-	-	-	-	-	-	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	1*	7*	100
Pithomyces	1	20	100	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Spegazzinia	-	-	-	-	-	-	-	-	-
Total Fungi	**1**	**20**	**100**	**-**	**None Detect**	**-**	**1**	**7**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	22	-	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	3	-	-	1	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	3	-	-	2	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



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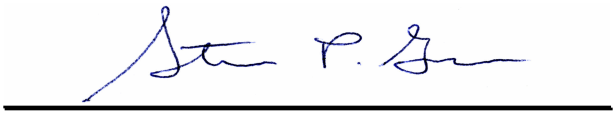
Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	131800564-0010			131800564-0011			131800564-0012		
Client Sample ID:	10-25535086			11-25534761			12-25535062		
Volume (L):	150			150			150		
Sample Location	Gym			C13 Music			Nurse		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	-	-	-	-	-	-	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	1	20	74.1	-	-	-	1*	7*	100
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces	1*	7*	25.9	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Spegazzinia	-	-	-	-	-	-	-	-	-
Total Fungi	**2**	**27**	**100**	**-**	**None Detect**	**-**	**1**	**7**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	22	-	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	3	-	-	1	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	3	-	-	2	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



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EMSL Order: 131800564
Customer ID: UEC63
Customer PO:
Project ID:

Attn: Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
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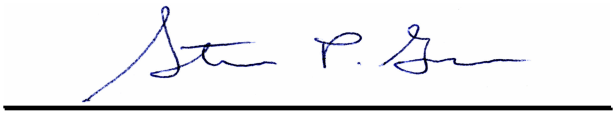
Phone: (617) 984-9772
Fax: (508) 628-5488
Collected: 01/26/2018
Received: 01/26/2018
Analyzed: 01/29/2018

Project: Fuller School - Framingham, MA

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	131800564-0013			131800564-0014			131800564-0015		
Client Sample ID:	13-25534806			14-25534776			15-25318598		
Volume (L):	1650			150			150		
Sample Location	C11			C3 Teachers			B30		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	1	2	100	2	40	100	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Spegazzinia	-	-	-	-	-	-	-	-	-
Total Fungi	**1**	**2**	**100**	**2**	**40**	**100**	**-**	**None Detect**	**-**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	2	-	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	<1*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	3	-	-	3	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	3	-	-	4	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



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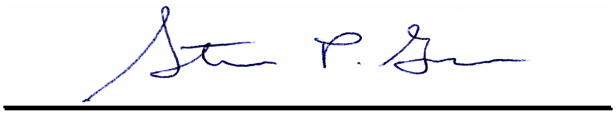
Project: Fuller School - Framingham, MA

Phone: (617) 984-9772
Fax: (508) 628-5488
Collected: 01/26/2018
Received: 01/26/2018
Analyzed: 01/29/2018

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	131800564-0016			131800564-0017			131800564-0018		
Client Sample ID:	16-25534775			17-25534737			18-25534771		
Volume (L):	150			150			150		
Sample Location	B17			B9			A12		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	-	-	-	1	20	33.3	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	2	40	66.7	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	1	20	100
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Spegazzinia	1	20	100	-	-	-	-	-	-
Total Fungi	**1**	**20**	**100**	**3**	**60**	**100**	**1**	**20**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	22	-	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	1	-	-	3	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	3	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



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Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number:	131800564-0019			131800564-0020		
Client Sample ID:	19-25534802			20-25317859		
Volume (L):	150			150		
Sample Location	A7A			Outside		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria	-	-	-	-	-	-
Ascospores	-	-	-	1	20	100
Aspergillus/Penicillium	-	-	-	-	-	-
Basidiospores	-	-	-	-	-	-
Bipolaris++	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-
Pithomyces	1*	7*	100	-	-	-
Rust	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-
Torula	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-
Spegazzinia	-	-	-	-	-	-
Total Fungi	**1**	**7**	**100**	**1**	**20**	**100**
Hyphal Fragment	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-
Pollen	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	22	-	-	22	-
Analyt. Sensitivity 300x	-	7*	-	-	7*	-
Skin Fragments (1-4)	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-
Background (1-5)	-	3	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
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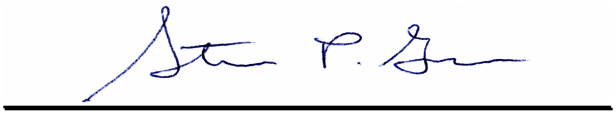

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