Soil and Land Use Technology, Inc.
1818 New York Ave. NE, Ste 231, Washington, DC 20002
Telephone: (301) 595-3783
www.salutinc.com

December 28, 2020

Prince George's County Public School
Environmental Safety Office
13306 Old Marlboro Pike
Upper Marlboro, MD 20772

Attention: Alex Baylor
alex.baylor@pgcps.org

Subject: Indoor Air Quality Survey
Robert Frost Elementary School
6419 85th Avenue
New Carrollton, MD 20784

Mr. Baylor:

On November 30, 2020, a Soil and Land Use Technology, Inc. (SaLUT) Industrial Hygienist conducted an indoor air quality (IAQ) evaluation at Robert Frost Elementary School, a property maintained by Prince George's County Public School (PGCPS) located at 6419 85th Avenue, New Carrollton, MD 20784. The inspection was performed in accordance with PGCPS contract number IFB 022-19.

Methodology

The IAQ evaluation conducted by SaLUT included a visual assessment, IAQ instrumentation screening, and a collection of interior air samples for mold in representative locations throughout the building. Additionally, one building exterior environmental air sample was taken for comparison.

Air-borne fungal spore samples were collected on *Air-O-Cell* cassettes using a Buck BioAire calibrated pump. The air samples were taken between three and five feet from the ground. In tandem with collecting mold samples, real-time readings for carbon dioxide, carbon monoxide, temperature and relative humidity were collected using a Fluke 975 Air Meter in representative areas within the facility.

The fungal spore air samples were delivered to EMSL Analytical, Inc. of Beltsville, Maryland for analysis. Fungal spores and particulates in air samples were analyzed by Optical Microscopy (methods EMSL 05-TP-003 and ASTM D7391). The sample chain-of-custody and laboratory reports are attached.

Observations

The table below summarizes the main observations from the IAQ survey at Robert Frost Elementary School, visited on November 30, 2020.

Table 1-Observations

Location	Summary of Observations 11-30-2020
Cafeteria	2'x4' ceiling tiles and 1'x1' tile floor; No visual signs of microbial growth; Mild odor; Stained ceiling tiles; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
Hallway next to Classroom 1	2'x4' ceiling tiles and 1'x 1' tile floor; No visual signs of microbial growth, and no odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC
2nd floor Hallway next to Classroom 12	2'x4' ceiling tiles and 1'x 1' tile floor; No visual signs of microbial growth, and no odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
Hallway next to GYM	2'x4' ceiling tiles and 1'x 1' tile floor; No visual signs of microbial growth, and no odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
Hallway next to Storage 1	2'x4' ceiling tiles and 1'x 1' tile floor; No visual signs of microbial growth, and no odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.

Measurements of Indoor Environmental Quality Parameters

Table 2 depicts a summary of average measurements of comfort.

Temperature

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) have published recommendations for year round acceptable temperatures in Standard 55-2010 *Thermal Environmental Conditions for Human Occupancy*. The winter comfort range is 20 to 24°C (68 to 75°F) and 23 to 26°C (73 to 79°F) is the summer comfort range. The temperature readings were within the ASHRAE recommended ranges in the representative spaces.

Relative Humidity (RH)

RH is a key factor for mold growth. Mold has the potential of growing on suitable surfaces with humidity levels above 60%. ASHRAE Standard 62.1-2010 *Ventilation for Acceptable Indoor Air Quality* recommends a maximum indoor RH of 65% to preclude the likelihood of condensation on cool surfaces encouraging mold growth. The RH readings were within the ASHRAE recommended ranges in the representative areas.

Carbon Dioxide (CO_2)

Under conditions of maximum occupancy, ASHRAE Standard 62.1-2010, Appendix C, infers that the acceptable CO_2 upper limit is the prevailing outdoor CO_2 concentration plus 700 parts per million (ppm). On the day of the space evaluation, the outdoor (building exterior) CO_2 concentration was approximately 452 ppm therefore indoor concentrations should not exceed approximately 1,152 ppm (700 + 452). The maximum average interior CO_2 concentration detected was 506 ppm in the Cafeteria, a range within the ASHRAE recommendations, per Table 2 below.

Carbon Monoxide (CO)

CO is a colorless and odorless gas that is produced by the incomplete combustion of carbon containing fuels. Oil, gasoline, diesel fuels, wood, coke, and coal are major sources of CO. All registered CO concentrations were below the EPA National Ambient Air Quality Standard (NAAQS) of 9 ppm, per Table 2 below.

Table 2: Robert Frost Elementary School, Instrumental Screening Levels
November 30, 2020 (7:30 AM-9:30 AM)

Sample Location	Temp °F	RH%	CO ppm	CO_2 ppm
Standards	**ASHRAE 68 to 75°F***	**ASHRAE <65%**	**NAAQS 9**	**ASHRAE 1,152**
Cafeteria	69.8	63.1	2	506
Hallway next to Classroom 1	71.6	63	2	476
2nd floor Hallway next to Classroom 12	74.3	58.1	2	458
Hallway next to GYM	69.8	69.9	2	473
Hallway next to storage 1	70.7	66.4	2	471
Outside EXT EV sample	67.1	77.3	2	452

PM – Particulate Matter size
°F – Degrees Fahrenheit
CO – Carbon Monoxide
ppm – parts per million
µg/m^3 – micrograms per cubic meter
RH% - % Relative Humidity
CO_2 – Carbon Dioxide
* - Winter Comfort Range

Mold-in-Air Samples

There are no definitive regulations or standardized guidelines for addressing airborne mold in an indoor setting. If building systems (ventilation, envelope) are functioning properly, the indoor population profile should mimic what is encountered outdoors and the concentrations should be below the outdoor (building exterior) environmental sample levels.

Tables 3 summarizes airborne mold spore sampling results and locations. On November 30, 2020, total mold counts in representative samples (spore count/m^3 of air) in all the areas inspected were lower than the outdoor concentrations. Laboratory analysis follows this report (see attachment).

Table 3: Robert Frost Elementary School – Measurements of Mold-in-Air Samples November 30, 2020 (7:30 AM-9:30 AM)

Spore Types	Cafeteria	Hallway next to Classroom 1	2nd floor Hallway next to Classroom 12	Hallway next to Gym
Alternaria (Ulocladium)	-	-	-	-
Ascospores	100	480	-	12300
Aspergillus/Penicillium	40	1000	40	830
Basidiospores	40600	4360	1000	57200
Bipolaris++	-	-	-	-
Chaetomium	-	-	-	-
Cladosporium	200	90	-	-
Curvularia	-	-	-	-
Epicoccum		10	-	-
Fusarium	-	-	-	-
Ganoderma	-	-	-	-
Myxomycetes++	10	10	40	10
Pithomyces++	-	-	-	-
Rust	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-
Unidentifiable Spores	-	-	-	-
Zygomycetes	-	-	-	-
Nigrospora	-	-	-	-
Hyphal Fragment	40	-	-	-
Insect Fragment	-	-	-	-
Pollen	-	-	-	-
Total Fungi	**40950**	**5950**	**1080**	**70340**

* Spore Counts per cubic meter of air (Counts/m^3).
++Includes other spores with similar morphology.

Table 3: Robert Frost Elementary School – Measurements of Mold-in-Air Samples continued November 30, 2020 (7:30 AM-9:30 AM)

Spore Types	Hallway next to storage 1	Outside EXT EV sample	Field Blank
Alternaria (Ulocladium)	-	-	-
Ascospores	1200	27400	--
Aspergillus/Penicillium	90	-	-
Basidiospores	40600	4800	-
Bipolaris++	-	-	-
Chaetomium	-	-	-
Cladosporium	230	-	-
Curvularia	-	-	-
Epicoccum	-	-	-
Fusarium	-	-	-
Ganoderma	-	-	-
Myxomycetes++	-	90	-
Pithomyces++	-	-	-
Rust	-	-	-
Scopulariopsis/Microascus	-	-	-
Stachybotrys/Memnoniella	-	-	-
Unidentifiable Spores	-	-	-
Zygomycetes	-	-	-
Nigrospora	40	-	-
Hyphal Fragment	-	-	-
Insect Fragment	-	-	-
Pollen	-	-	-
Total Fungi	**42160**	**75490**	**No Trace**

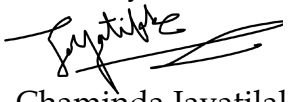
*Spore Counts per cubic meter of air (Counts/m^3).
++Includes other spores with similar morphology.

Findings and Conclusions

The comfort parameters (i.e., temperature, RH, CO_2, and CO levels) in the representative areas conform to ASHRAE and/or NAAQS guidelines. On November 30, 2020, total mold counts in representative area samples (spore count/m^3 of air) in all the areas inspected were lower than the outdoor concentrations with the exception of Hallway next to Gym, indicating no amplified mold growth.

Thank you for the opportunity to provide industrial hygiene services for PGCPS. If you have any questions, please contact me at 301.595.3783.

Sincerely,



Chaminda Jayatilake, PE, CIH, CSP, CHMM
Certified Industrial Hygienist
Soil and Land Use Technology Inc. (SaLUT)

Attachment

Attachment - Mold Spore Sample Analytical Results and Chain-of-Custody Forms

Attachment

Mold Spore Sample Analytical Results and Chain-of-Custody Forms

EMSL Analytical, Inc.

10768 Baltimore Avenue Beltsville, MD 20705

Tel/Fax: (301) 937-5700 / (301) 937-5701

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

EMSL Order: 192011818
Customer ID: SALU50
Customer PO:
Project ID:

Attention: Indika Jayatilake
SaLUT
1818 New York Avenue, NE
Suite 231
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Phone: (301) 595-3783
Fax: (301) 595-3787
Collected Date: 11/30/2020
Received Date: 11/30/2020 02:31 PM
Analyzed Date: 12/02/2020

Project: ROBERT FROST ES/PGCPS IAQ - 6419 85TH AVE, NEW CARROLLTON, MD 20784

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

Lab Sample Number:	192011818-0001			192011818-0002			192011818-0003		
Client Sample ID:	01			02			03		
Volume (L):	75			75			75		
Sample Location:	CAFETERIA			HW NEXT TO RM 1			2ND FL HW NEXT TO RM 12		
Spore Types	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	3	100	0.2	11	480	8.1	-	-	-
Aspergillus/Penicillium	1	40	0.1	23	1000	16.8	1	40	3.7
Basidiospores	930	40600	99.1	100	4360	73.3	23	1000	92.6
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	5	200	0.5	2	90	1.5	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	1*	10*	0.2	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1*	10*	0	1*	10*	0.2	1	40	3.7
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Total Fungi	**940**	**40950**	**100**	**138**	**5950**	**100**	**25**	**1080**	**100**
Hyphal Fragment	1	40	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	1	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

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

Abubakar Barry, Microbiology Laboratory Manager or other Approved Signatory

Initial report from: 12/03/2020 09:13 AM

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

EMSL Analytical, Inc.

10768 Baltimore Avenue Beltsville, MD 20705

Tel/Fax: (301) 937-5700 / (301) 937-5701

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Project: ROBERT FROST ES/PGCPS IAQ - 6419 85TH AVE, NEW CARROLLTON, MD 20784

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

Lab Sample Number:	192011818-0004			192011818-0005			192011818-0006		
Client Sample ID:	04			05			06		
Volume (L):	75			75			75		
Sample Location:	HW NEXT TO GYM			HW NEXT TO STORAGE 1			OUTSIDE EXT EV SAMPLE		
Spore Types	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**	**Raw Count**	**Count/M³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	281	12300	17.5	28	1200	2.8	627	27400	36.3
Aspergillus/Penicillium	19	830	1.2	2	90	0.2	-	-	-
Basidiospores	1310	57200	81.3	930	40600	96.3	1100	48000	63.6
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	17*	230*	0.5	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1*	10*	0	-	-	-	2	90	0.1
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	1	40	0.1	-	-	-
Total Fungi	**1611**	**70340**	**100**	**978**	**42160**	**100**	**1729**	**75490**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	1	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

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

Abubakar Barry, Microbiology Laboratory Manager or other Approved Signatory

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Project: ROBERT FROST ES/PGCPS IAQ - 6419 85TH AVE, NEW CARROLLTON, MD 20784

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

Lab Sample Number:	192011818-0007								
Client Sample ID:	07								
Volume (L):									
Sample Location:	FIELD BLANK								
Spore Types	**Raw Count**	**Count/M³**	**% of Total**						
Alternaria (Ulocladium)	-	-	-						
Ascospores	-	-	-						
Aspergillus/Penicillium	-	-	-						
Basidiospores	-	-	-						
Bipolaris++	-	-	-						
Chaetomium	-	-	-						
Cladosporium	-	-	-						
Curvularia	-	-	-						
Epicoccum	-	-	-						
Fusarium	-	-	-						
Ganoderma	-	-	-						
Myxomycetes++	-	-	-						
Pithomyces++	-	-	-						
Rust	-	-	-						
Scopulariopsis/Microascus	-	-	-						
Stachybotrys/Memnoniella	-	-	-						
Unidentifiable Spores	-	-	-						
Zygomycetes	-	-	-						
Nigrospora	-	-	-						
Total Fungi	-	**No Trace**	-						
Hyphal Fragment	-	-	-						
Insect Fragment	-	-	-						
Pollen	-	-	-						
Analyt. Sensitivity 600x	-	0	-						
Analyt. Sensitivity 300x	-	0*	-						
Skin Fragments (1-4)	-	-	-						
Fibrous Particulate (1-4)	-	-	-						
Background (1-5)	-	-	-						

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

Abubakar Barry, Microbiology Laboratory Manager
or other Approved Signatory

Initial report from: 12/03/2020 09:13 AM

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OrderID: 192011818

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Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*): 192011818

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FAX

Company Name: SaLUT Inc	**EMSL-Bill to:** ☒ Same ☐ Different If Bill to is Different note instructions in Comments**
Street: 1818 New York Ave NE Suite 231	*Third Party Billing requires written authorization from third party*
City: Washington **State/Province:** DC	**Zip/Postal Code:** 20002 **Country:** USA
Report To (Name): Indika Jayatilake	**Telephone #:** 301-595-3783
Email Address: ijayatilake@salutinc com	**Fax #:** **Purchase Order:**
Project Number/Location: Robert Frost ES / PGCPS IAQ	***Please Provide Results:*** ☐ Fax ☒ Email
Location Address: 6419 85th Ave, New Carrollton, MD 20784	**Connecticut Samples:** ☐ Commercial ☐ Residential

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide. TATs are subject to methodology requirements*

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

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

Turnaround Time (TAT) Options * - Please Check

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

Microbiology Test Codes

M001 Air-O-Cell
M030 Micro 5
M174 MoldSnap
M032 Allergenco-D
M041 Fungal Direct Examination
M169 Pollen ID & Enumeration
M280 Dust Characterization Level-1
M281 Dust Characterization Level-2
M005 Viable Fungi- Air Samples (Genus ID & Count)
M006 Viable Fungi- Air Samples (Includes *Penicillium, Aspergillus, Cladosporium, Stachybotrys* Species ID & Count)
M007 Culturable fungi - Surface Samples (Genus ID & Count)
M008 Culturable fungi - Surface Samples (Includes *Penicillium, Aspergillus, Cladosporium, Stachybotrys* Species ID & Count)
M009 Bacteria Culture Gram Stain & Count
M010 Bacteria Count & ID - 3 Most Prominent
M011 Bacteria Count & ID - 5 Most Prominent
M012 Pseudomonas aeruginosa (P/A***)

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

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

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

Name of Sampler: Jude Fonseka **Signature of Sampler:**

Sample #	Sample Location/Description	Sample Type	Potable/ NonPotable (only for waters)	Test Code	Volume/ Area	Date/Time Collected	Temperature (°C) (Lab Use Only)
01	Cafeteria	Air		M001	75L	11/30/2020	
02	H/W next to room 1	Air		M001	75L	11/30/2020	
03	2nd floor H/W next to room 12	Air		M001	75L	11/30/2020	
04	H/W next to GYM	Air		M001	75L	11/30/2020	
05	H/W next to Storage 1	Air		M001	75L	11/30/2020	
06	Outside Exterior EV Sample	Air		M001	75L	11/30/2020	

Client Sample # (s): - **Total # of Samples:** 07 **Samples Received Chilled? Yes / No**

Relinquished (Client): **Date:** **Time:**

Received (Lab): Received dropbox **Date:** **Time:**

Comments/Special Instructions:

RECEIVED
2020 DEC 30 P 2:31
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BALTIMORE, MD

Page 1 of _____

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Microbiology Chain of Custody

EMSL Order Number *(Lab Use Only)*:

PHONE:
FAX

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Location/Description	Sample Type	Potable/ NonPotable	Test Code	Volume/ Area	Date/Time Collected	Temperature (°C) (Lab Use Only)
07	Field Blank	Air		N/A	N/A	11/30/2020	

Comments/Special Instructions: