INDOOR AIR QUALITY SURVEY

PROJECT LOCATION:
Rockhill Elementary School
510 Meadow Street
Rockhill Furnace, Pennsylvania 17249

PROJECT DATE:
August 12, 2019

PREPARED FOR:
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CALI PROJECT NUMBER:
19-1049-005

REPORT DATE:
August 14, 2019

SURVEY PERFORMED BY/REPORT REVIEWED BY:

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Executive Summary:

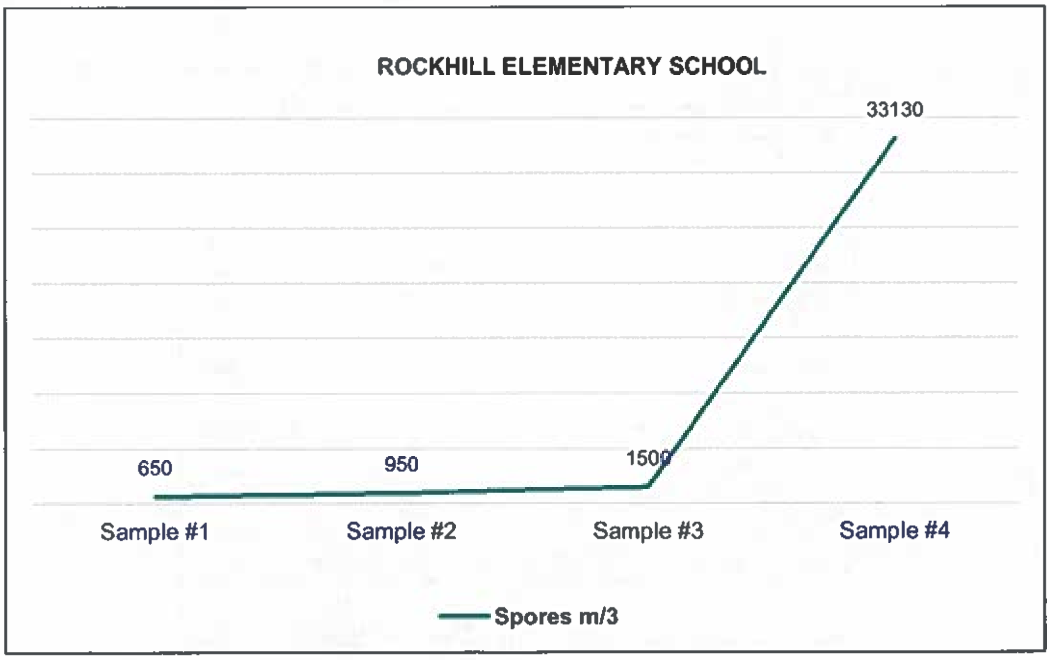
In August of 2019, Cumberland Analytical Laboratories, Inc. (CALI) was contracted by the Southern Huntingdon County School District to perform an Indoor Air Quality Survey at the Rockhill Elementary School. This survey consisted of the collection of air samples for airborne fungal contaminants.

Unusual Mold Explanations and Survey Results:

The results of the Non-Viable Spore Trap Samples collected showed that **NO** unusual mold condition exists in the samples. Please refer to the individual sample results as listed in the Non-Viable Spore Trap Results Table for more detailed information regarding this individual sample result.

Sample No.	Sample Location	Sample Type	Unusual Mold Conditions Exist
1	Room 105	Mold Air	No
2	Room 100	Mold Air	No
3	Room 109	Mold Air	No
4	Outside	Mold Air	N/A

Non-Viable Mold Spore Trap Samples IAQ Chart:



Test Results: Allergenco-D(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391) Table #1:

Lab Sample Number: Client Sample ID: Volume (L): Sample Location:	371917807-0001 01 75 Room 105			371917807-0002 02 75 Room 100			371917807-0003 03 75 Room 109		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Ascospores	2	90	13.8	-	-	-	1*	10*	0.7
Aspergillus/Penicillium	1	40	6.2	-	-	-	1	40	2.7
Basidiospores	12	520	80	20	870	91.6	33	1400	93.3
Cladosporium	-	-	-	1	40	4.2	1	40	2.7
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	1	40	4.2	-	-	-
Rust	-	-	-	-	-	-	1*	10*	0.7
Total Fungi	15	650	100	22	950	100	37	1500	100
Hyphal Fragment	-	-	-	-	-	-	1*	10*	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	1	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

Test Results: Allergenco-D(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391) Table #2:

Lab Sample Number: Client Sample ID: Volume (L): Sample Location:	371917807-0004 04 75 Outside		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**
Ascospores	33	1400	4.2
Aspergillus/Penicillium	9	400	1.2
Basidiospores	693	30200	91.2
Cladosporium	14	610	1.8
Ganoderma	10	440	1.3
Myxomycetes++	1	40	0.1
Rust	1	40	0.1
Total Fungi	761	33130	100
Hyphal Fragment	1	40	-
Analyt. Sensitivity 600x	-	44	-
Analyt. Sensitivity 300x	-	13*	-
Skin Fragments (1-4)	-	1	-
Fibrous Particulate (1-4)	-	1	-
Background (1-5)	-	1	-

Mold Definitions:

Spore Name	Description
Ascospores	Considered an allergen, ascospores produce toxins, which can pose a series of health issues for humans if exposed to for long periods of time. Ascospores are a type of mold that typically develops during the winter on fallen, dead leaves that were previously infested. When it rains, it triggers the release spores in the air. You can find this type of mold practically anywhere, but indoors it will start growing on moist materials.
Aspergillus/Penicillium	Reported to be allergenic. Many species have been documented to produce mycotoxins, which may be associated with pulmonary disease in humans and other animals. Research studies have implicated several of these toxins as carcinogens in laboratory animals following inhalation. A wide number of organisms have been grouped into these two genera. Extremely difficult to identify down to species level. Typically identified in soil, cellulose, food, paint, compost piles, carpeting, wallpaper and in the fiberglass insulation used in interior ductwork.
Basidiospores	Reported to be allergenic. These spores are produced by mushrooms and are difficult to identify down to species level.
Cladosporium Spores	Reported to be allergenic. Most commonly identified spore in outdoor samples. Highly seasonal. Indoor species may differ from outdoor species. Typically found inside supply ducts.
Ganoderma	Ganoderma is a genus of polypore fungi in the family Ganodermataceae that includes about 80 species, many from tropical regions. Because of their genetic diversity, use in traditional Asian medicines, and potential in bioremediation, they are an important genus economically. Ganoderma can be differentiated from other polypore's because they have a double-walled basidiospore. They are sometimes called shelf mushrooms or bracket fungi.
Myxomycetes	Reported to be allergenic. This class of fungal spores is most often related to agriculture and plant disease and is rarely found indoors.
Hyphal Fragment	Hyphae are small fragments of the mycelium of a mold. Mycelium is a mass of hyphae; this is the vegetative body portion of the mold. It is common to find small number of hypha fragments in outdoor air and possibly in indoor dust. Their presence in indoor air samples in a high quantity or as large segments.
Rust	Plant diseases tend to be associated with this type of fungus. The two groups (smuts and rusts) produce wind-carrying, resistant teliospores which is the basis for how they are classified. Rusts are known to attack the vegetative part of plants e.g. leaves and stems while smuts are mostly related to plants' reproductive parts such as seeds. They are also causing of asthma and hay fever in humans.

Recommendations:

No further testing is warranted at this time.

Methods and Analysis – Air Sampling:

Particle air sampling techniques were used. Air samples were collected using a calibrated high volume-sampling pump and Allergenco D Cassettes. The samples were packaged for proper shipment and delivered to EMSL Analytical, Inc. Industrial Hygiene Association (AIHA) accredited laboratory located out of Cinnaminson, New Jersey.

While the results and information of this analysis are considered to be reliable, CALI assumes no responsibility for the accuracy of these results.

Standards – Bacterial/Mold:

There are no current Permissible Exposure Levels or Safe Levels established by OSHA or NIOSH. EPA has guidelines on mold remediation in schools, yet no clearance levels have been established. Molds are a major source of indoor allergens. Molds can also trigger asthma. Even when dead or unable to grow, mold can cause health effects such as allergic reactions. The types and severity of health effects associated with exposure to mold depend, in part, on the type of mold present and the extent of the occupants' exposure and existing sensitivities or allergies. Prompt and effective remediation of moisture problems is essential to minimize potential mold exposures and their potential health effects.

Statistically, total spore counts are always significantly correlated with counts conducted on Agar Plate samples. On average, total mold spore to culturable mold ratios are in the range of 10:1. A concentration dominated by one genus such as Penicillium or Aspergillus even at 14,000 Particles/m^3 is unacceptable. Total levels should not exceed 2,000 Particles/m^{30}, and each individual count should not exceed 650 Particles/m^3. For remediation, a reduction of airborne spores based upon Pre and Post sampling, compared to exterior sample results, and no evidence of mold growth present is the goal.