

INDOOR AIR QUALITY SURVEY

SAMPLING LOCATION:

East Pennsboro Elementary School
840 Panther Parkway
Enola, Pennsylvania

SAMPLING DATE:

August 3, 2017

PREPARED FOR:

Mr. Chad Reigle
East Pennsboro Area School District
890 Valley Street
Enola, Pennsylvania 17025

CALI PROJECT NUMBER:

17-1081-008

REPORT DATE:

August 7, 2017

Survey Performed By:



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Table of Contents

Executive Summary:	2
Unusual Mold Expiations:.....	2
Methods and Analysis – Air Sampling:	2
Standards – Bacterial/Mold:.....	2
Survey Results:.....	3
Recommendations:.....	3
Non-Viable Mold Spore Trap Sample Results Table #1:	4
Non-Viable Mold Spore Trap Sample Results Table #2:	5
Non-Viable Mold Spore Trap Sample Results Table #3:	6
Mold Definitions:	7

Executive Summary:

In August 2017, Cumberland Analytical Laboratories, Inc. (CALI) was contracted by the East Pennsboro Area School District to perform an Indoor Air Quality Survey at the East Pennsboro Elementary School. This survey consisted of the collection of air samples for airborne fungal contaminants on August 3, 2017, by Richard E. Roush, CIAQM, Project Manager of Cumberland Analytical Laboratories, Inc.

Unusual Mold Expiations:

The results table listed below showed that **unusual mold conditions exist** in **2 of the samples**. Please refer to the individual sample results (Page 4, Page 5 and Page 6) for more detailed information regarding these individual samples.

Sample No.	Sample Location	Sample Type	Unusual Mold Conditions Exist
01	Room 116	Mold Air	No
02	Outside Room 115	Mold Air	No
03	Hallway by Faculty Break Room	Mold Air	No
04	Hallway by Room 106	Mold Air	No
05	Room 104	Mold Air	No
06	Room 001	Mold Air	Yes
07	Hallway by Outside Room 2	Mold Air	Yes
08	Outside Room 09 Hallway	Mold Air	No
09	Room 009	Mold Air	No
010	Outside	Mold Air	N/A

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. Sample analysis provided by Environmental Hazard Services, located in Richmond, Virginia.

The samples were packaged for proper shipment and delivered to EHS Laboratories an American Industrial Hygiene Association (AIHA) accredited laboratory located out of Richmond, Virginia. *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 10,000 Particles/m³ is unacceptable. Total levels should not exceed 2,000 Particles/m³, and each individual count should not exceed 650 Particles/m³. 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.

Survey Results:

The result of the Non-Viable Spore Trap Sample collected on 08/03/2017, **showed that unusual mold condition exists in 2 of the samples (Sample #6 and Sample #7)**. Please refer to the individual sample results as listed on Page 4, Page 5 and Page 6 of this report, for more detailed information regarding this individual sample.

Recommendations:

It is recommended that to lower the total spore counts in this area, good housekeeping practices should be intensified while including the use of a bio-cide cleaning solution and HEPA vacuuming. Housekeeping is an effective measure to maintain Indoor Air Quality within a structure, as well as minimize the release of harmful materials into the structure that will negatively affect Indoor Air Quality. Cleaning and sterilizing activities also will decrease the risk of exposure to biological growth and contamination. Also, an air scrubber containing a HEPA filter should be used during and after the cleanup for a minimum of 24-36 hours at which time the areas should be retested to ensure that airborne fungal populations have been lowered to acceptable levels.

Indoor Air Quality Survey Report for the East Pennsboro Area School District
East Pennsboro Elementary School on August 3, 2017
CALI Project Number: 17-1081-008
Report Date: August 7, 2017
Page 4

Non-Viable Mold Spore Trap Sample Results Table #1:

Spore ID	17-08-00641-010		17-08-00641-001		17-08-00641-002		17-08-00641-003		17-08-00641-004	
	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)
Cladosporium Spores	87	1200	4	53	3	40	15	200	7	93
Penicillium/Aspergillus Group Spores	10	130	4	53	4	53	2	27	0	0
Alternaria Spores	1	13	0	0	0	0	2	27	0	0
Aureobasidium Spores	1	13	0	0	0	0	1	13	1	13
Pyricularia Spores	3	40	0	0	0	0	1	13	0	0
Curvularia Spores	1	13	0	0	0	0	1	13	0	0
Pithomyces Spores	2	27	0	0	3	40	0	0	0	0
Epicoccum Spores	0	0	0	0	0	0	1	13	0	0
Cercospora Spores	3	40	0	0	0	0	0	0	0	0
Nigrospora Spores	4	53	0	0	0	0	0	0	0	0
Fusarium Spores	2	27	0	0	0	0	0	0	0	0
Smuts, Periconia, Myxomycetes	7	93	0	0	1	13	3	40	2	27
Total Spores (Spores/m3)	----	1600	----	110	----	150	----	350	----	130

Indoor Air Quality Survey Report for the East Pennsboro Area School District
East Pennsboro Elementary School on August 3, 2017
CALI Project Number: 17-1081-008
Report Date: August 7, 2017
Page 5

Non-Viable Mold Spore Trap Sample Results Table #2:

Lab No. Client Sample ID: Date Collected: Collection Location: Sampling Media: Analytical Sensitivity spores/m3: Volume (L):	17-08-00641-010 010 08/03/2017 OUTSIDE Air-O-Cell 13.3 75		17-08-00641-005 05 08/03/2017 Room 104 Air-O-Cell 13.3 75		17-08-00641-006 06 08/03/2017 Room 001 Air-O-Cell 13.3 75		17-08-00641-007 07 08/03/2017 Hallway Outside Room 2 Air-O-Cell 13.3 75		17-08-00641-008 08 08/03/2017 Outside Room 09 Hallway Air-O-Cell 13.3 75	
Spore ID	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)
Cladosporium Spores	87	1200	2	27	1	13	3	40	6	80
Penicillium/Aspergillus Group Spores	10	130	1	13	243	3200	270	3600	21	280
Alternaria Spores	1	13	0	0	0	0	2	27	1	13
Aureobasidium Spores	1	13	0	0	0	0	1	13	0	0
Arthrinium Spores	0	0	0	0	0	0	0	0	1	13
Pyricularia Spores	3	40	0	0	0	0	0	0	0	0
Curvularia Spores	1	13	0	0	0	0	0	0	0	0
Stachybotrys Spores	0	0	0	0	0	0	0	0	2	27
Chaetomium Spores	0	0	0	0	0	0	0	0	1	13
Pithomyces Spores	0	0	0	0	0	0	0	0	1	13
Cercospora Spores	3	40	0	0	0	0	0	0	0	0
Nigrospora Spores	4	53	0	0	0	0	0	0	1	13
Fusarium Spores	2	27	0	0	0	0	0	0	0	0
Spegazzinia Spores	0	0	0	0	0	0	0	0	1	13
Smuts, Periconia, Myxomycetes	7	93	0	0	0	0	5	67	4	53
Total Spores (Spores/m3)	----	1600	----	40	----	3300	----	3800	----	520

Indoor Air Quality Survey Report for the East Pennsboro Area School District
East Pennsboro Elementary School on August 3, 2017
CALI Project Number: 17-1081-008
Report Date: August 7, 2017
Page 6

Non-Viable Mold Spore Trap Sample Results Table #3:

Lab No. Client Sample ID: Date Collected: Collection Location: Sampling Media: Analytical Sensitivity spores/m3: Volume (L):	17-08-00641-010 010 08/03/2017 OUTSIDE Air-O-Cell 13.3 75	17-08-00641-009 09 08/03/2017 Room 009 Air-O-Cell 13.3 75		
Spore ID	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)
Cladosporium Spores	87	1200	10	130
Penicillium/Aspergillus Group Spores	10	130	14	190
Alternaria Spores	1	13	0	0
Aureobasidium Spores	1	13	0	0
Pyricularia Spores	3	40	0	0
Curvularia Spores	1	13	0	0
Pithomyces Spores	0	0	0	0
Cercospora Spores	3	40	0	0
Nigrospora Spores	4	53	0	0
Fusarium Spores	2	27	0	0
Spegazzinia Spores	0	0	0	0
Smuts, Periconia, Myxomycetes	7	93	0	0
Total Spores (Spores/m3)	----	1600	----	320

Indoor Air Quality Survey Report for the East Pennsboro Area School District
East Pennsboro Elementary School on August 3, 2017
CALI Project Number: 17-1081-008
Report Date: August 7, 2017
Page 7

Mold Definitions:

Spore Name	Description
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.
Penicillium/Aspergillus Group Spores	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.
Alternaria Spores	Reported to be allergenic. Commonly found growing in carpets and on indoor textiles. These fungi have been indicated as a potential cause of hypersensitivity pneumonitis. Rare species known to produce tenuazonic acid and other toxic metabolites that may cause disease in humans.
Aureobasidium Spores	Reported to be allergenic. Commonly found in high moisture areas such as bathrooms and kitchens. Rarely associated with skin disorders.
Arthrinium Spores	Reported to be allergenic. Typically found associated with agriculture. Rarely found in indoor samples.
Pyricularia Spores	No information regarding the health effects of this genus is available at this time. All mold should be treated as potential allergens.
Curvularia Spores	Reported to be allergenic. No additional health data for this genus is available at this time.
Stachybotrys Spores	Toxigenic. Also recognized as an allergen. Typically, a fungus of dark green/black coloration, it grows readily on building materials with a high cellulose content but low in nitrogen, and is rarely observed in outdoor samples. Certain strains of Stachybotrys may produce the mycotoxin, trichothecene under appropriate conditions which has been documented to cause problems associated with the circulatory, alimentary, skin and nervous systems. Absorption of trichothecene into the tissues of the human lung may cause a condition known as pneumomycosis. Although there have been conflicting studies concerning the toxicity of this fungi, it still appears that extreme caution should be practiced when dealing with this mold.
Chaetomium Spores	Reported to be allergenic. Some species may be associated with disease in humans. Commonly found on the paper used as facing on sheetrock.
Pithomyces Spores	Reported to be allergenic. Some species may, in rare instances, produce the toxin sporidesmin.
Epicoccum Spores	Reported to be allergenic. Commonly found on plants, textiles and products made of paper.
Cercospora Spores	No information regarding the health effects of this genus is available at this time. All molds should be treated as potential allergens.
Nigrospora Spores	Reported to be allergenic. No additional health data for this genus is available at this time.
Fusarium Spores	Toxigenic. Also recognized as an allergen. Certain species of Fusarium may produce the mycotoxin, trichothecene, under appropriate conditions, which has been documented to cause problems associated with the circulatory, alimentary, skin and nervous systems. Absorption of trichothecene into the tissues of the human lung may cause a condition known as pneumomycosis. Symptoms may appear following exposure from either inhalation or ingestion. Rarely connected to infections of the eye, skin and nails.
Spegazzinia Spores	Reported to be allergenic. Rarely found indoors.
Smuts, Periconia, Myxomycetes	Reported to be allergenic. This class of fungal spores is most often related to agriculture and plant disease and is rarely found indoors.