

REPORT OF FINDINGS

INDOOR AIR QUALITY STUDY
CRYSTAL LAKE ELEMENTARY SCHOOL DISTRICT 47
RICHARD BERNOTAS MIDDLE SCHOOL
170 N OAK STREET
CRYSTAL LAKE, IL 60014

MOLD SAMPLING

Prepared by

PEPPER ENVIRONMENTAL TECHNOLOGIES, INC.
411 Lake Zurich Road, Barrington, Illinois 60010

February 22, 2025

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INTRODUCTION

Brief overview of the consultant’s responsibilities:

Pepper Environmental Technologies, Inc. (PET) was contracted by Crystal Lake Elementary School District 47 representative, Mr. David Schuh, to perform an indoor air quality test within Rooms located in Richard Bernotas Middle School, located at 170 N. Oak St., Crystal Lake, Illinois 60014.

Date air sampling performed:

February 20, 2025

Weather conditions for February 20, 2025

Cold. 0-5 MPH Wind. Approximately 15 degrees Fahrenheit (F) around 10 AM. Indoor HVAC controlled by automated control systems. Operation of HVAC normal/no problems or discrepancies in system. Control sample were collected indoors due to below zero outdoor temperatures.

Name of Crystal Lake Elementary School District 47 point of contact.

Mr. David Schuh
 Director of Operations
 Operations Center
 221 Liberty Rd.
 Crystal Lake, Illinois 60014
 Phone (815) 788-5061

Name and address of laboratory:

EMSL Analytical Inc.
 4140 Litt Drive
 Hillside, Illinois 60162
 Phone: (773) 313-0099

TEST PERFORMED/SCOPE OF WORK

Air sampling for mold spores using a high-volume stationary pump and “Air-O-Cell” cassettes.

Substances, Media types, Methods of Analysis

Analysis	Media Type	Method/Model
Mold Spores in Air	Air-O-Cell Cassettes	Micro-SOP-201/Zefon Bio Pump Plus

Sampling began by removing the tape seals covering the inlet and outlet of the Air-O-Cell and being placed on the side of the cassette. The sampling pump was turned on and calibrated using the supplied rotometer. Finding the flow rate to be 15 liters per minute the Air-O-Cell Cassette was placed on the air pump and re started. The sample collection in both areas was 5 minutes for a total volume of 75 Liters of air. After 5 minutes of sample time the cassette was removed from the pump and the tape resecured on the cassette.

Summary of Findings, Number of Air Samples, Locations

Analysis	Number	Location(s)
Mold Spores in Air	Room 32	Ascospores, Aspergillus /Penicillium, Basidiospores, unidentifiable spores
Mold Spores in Air	Doorway 5	Aspergillus /Penicillium, Basidiospores, unidentifiable spores

SUMMARY OF MOLD AIR SAMPLING RESULTS

Currently there are no federal, state, or local standards regulating exposure to molds. In lieu of any standard, samples are usually evaluated in one of two ways. The first is by comparing the total airborne concentration of spores found inside the building to those found outside the building. Typically, inside concentrations are less than outdoor concentrations. If the opposite occurs, it may be an indication of a concern. The second method is to evaluate the genus/species of the mold spores identified. In general, airborne mold specie-types identified inside a building should be similar to those found outside the building. If significant variations are observed, it may also be an indication of a potential mold problem.

In the case of the indoor air samples, mold spore concentrations found on the collected sample was a total spores count of 1,020 spores per square millimeter (sp/m³).

The control air sample total spores count of 590 spores per square millimeter (sp/m³). 1.8 times lower than the indoor sample.

The mold specie-types found indoors is similar to spores found on the control sample. According to the CDC The most common indoor molds are Cladosporium, Penicillium, and Aspergillus. Mold is found both indoors and outdoors. The National Institute of Health reports the Aspergillus species is a ubiquitous mold in home and hospital environments.

Some literature suggests that airborne spores generally should be less than approximately 1,500 cts/m³. Aspergillus /Penicillium and other hyaline spores are on average less than 700 cts/m³.

Basidiospore levels of 1,000–5,000 per cubic meter are common and usually not a health concern.

Ascospore levels, concentrations of over 5,000 spores/m³ may be of a concern to susceptible populations.

CONCLUSIONS AND RECOMMENDATIONS

Mold spores do not appear to be a likely pollutant sources in the areas tested

Based on our air monitoring results and data, the indoor target locations monitored during this study appear to be safe for occupancy and are not considered elevated. Based on the wide range of sensitivities that vary amongst occupants, PET recommends that Crystal Lake School District 47 continues:

- Using “green” cleaning agents to perform the daily housekeeping activities.
- Keeping exterior doors closed whenever possible.
- Monitoring ceilings and walls for signs of water intrusion.
- Regularly changing filters on heating, ventilation and air conditioning equipment.

CONFIDENTIALITY

Pepper Environmental Technologies, Inc. has treated all aspects of this study as strictly confidential.

This study was not intended to include every health hazard or exposure that may be present in the building; only those items specifically addressed in the report were evaluated. Results are based on conditions observed during our survey. Substantial changes in conditions, methods of operation, or materials used can alter the outcome of an environmental survey. If you have any questions concerning this study, please let us know.

Pepper Environmental Technologies Inc. has conducted this study in the interest of Crystal Lake Elementary School District 47 to assist in preventing occupant illness and in meeting environmental obligations. In this respect, we hope the results of this study are useful.

Respectfully submitted,

Pepper Environmental Technologies, Inc.

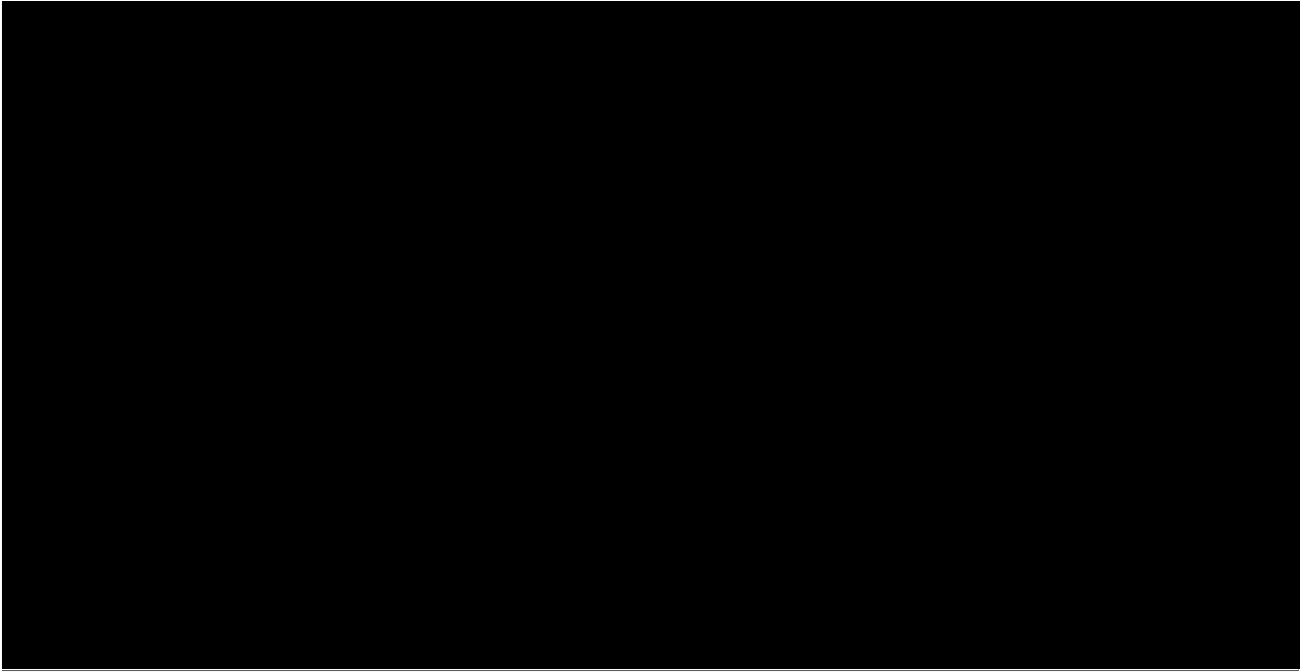


Brent Barth
Senior Project Manager

Forms Attached:

Sample Location

FEBRUARY 20, 2025 - MOLD SAMPLE LOCATIONS



Room 32



Door 5

EMSL Laboratory Report



EMSL Analytical, Inc.

4140 Litt Drive Hillside, IL 60162
 Tel/Fax: (773) 313-0099 / (773) 313-0139
<http://www.EMSL.com> / chicagolab@emsl.com

EMSL Order: 262501549
 Customer ID: PEPE25
 Customer PO: 2400913EEE
 Project ID:

Attention: Brent Barth
 Pepper Environmental
 411 Lake Zurich Road
 Barrington, IL 60010

Phone: (312) 266-4700
Fax:
Collected Date:
Received Date: 02/20/2025 03:23 PM
Analyzed Date: 02/20/2025 - 02/21/2025

Project: RBMS

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

Lab Sample Number: Client Sample ID: Volume (L): Sample Location:	262501549-0001 RM 32 75			262501549-0002 DOOR 5 FOYER 75		
	CENTER			CENTER		
Spore Types	Raw Count†	Count/m³	% of Total	Raw Count†	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-
Ascospores	1	40	3.9	-	-	-
Aspergillus/Penicillium++	19	830	81.4	9	400	67.8
Basidiospores	3	100	9.8	3	100	16.9
Bipolaris++	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-
Rust	1	10*	1	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-
Unidentifiable Spores	1	40	3.9	2	90	15.3
Zygomycetes	-	-	-	-	-	-
Total Fungi	25	1020	100	14	590	100
Hyphal Fragment	-	-	-	1	40	-
Insect Fragment	-	-	-	-	-	-
Pollen	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	3	-	-	3	-
Fibrous Particulate (1-4)	-	2	-	-	2	-
Background (1-5)	-	1	-	-	1	-

† Due to method stopping rules, extrapolated raw counts are reported in parenthesis.
 ++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.



Andrei Poluchowicz, Microbiology Technical Manager
 or other Approved Signatory

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

EMSL Analytical, Inc. maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. EMSL Analytical, Inc. bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. Skin Fragment and Fibrous Particulate ratings are based on the percent of non-fungal material they represent: 1 (1-25%), 2 (26-50%), 3 (51-75%), or 4 (76-100%). Background ratings are based on the total area covered by non-fungal particles: 1 (1-25%), 2 (26-50%), 3 (51-75%), 4 (76-99%), or 5 (100%; overtested). 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 >= 100 are extrapolated based on the percentage analyzed.
 Samples analyzed by EMSL Analytical, Inc. Hillside, IL/AHA LAP, LLC-EMLAP Accredited #102902

Initial report from: 02/21/2025 11:04 AM

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

OrderID: 262501549

Microbiology Chain of Custody Form
EMSL Order Number / Lab Use Only

411 Lake Zurich Rd.
Cinnaminson, NJ 08077
Barrington


PHONE: 8474899846

EMAIL: bbarth@pepperenvironmental.com

EMSL ANALYTICAL, INC.
TESTING LABS • PROTOCOLS • TRAINING

262501549

If BB-To is the same as Report-To leave this section blank. Third-party billing requires written authorization.

Customer Information Customer ID: PEPE 025 Company Name: Pepper Environmental Technologies, Inc. Contact Name: Brent Barth Street Address: 411 Lake Zurich Rd. City, State, Zip Code: Barrington Country: US Phone: Brent 847 489-9846 Email(s) for Report: bbarth@pepperenvironmental.com		Billing Information Billing ID: Company Name: Pepper Environmental Technologies, Inc. Billing Contact: Street Address: City, State, Zip Code: Country: Phone: Email(s) for Invoice:					
Project Information Project Name/No: RBMS EMSL LIMS Project ID: (If applicable, EMSL will provide) State Samples Collected: IL Zip Code Samples Collected: State of Connecticut (CT) must select project location: <input type="checkbox"/> Commercial (Taxable) <input type="checkbox"/> Residential (Non-taxable)		Purchase Order: 2400913 EEE No. of Samples in Shipment: 2					
Sampled By Name: Brent Sampled By Signature: 		Sterile, Sodium Thiosulfate Preserved Bottle Used: <input type="checkbox"/> Bioicide Used in Source (specify) Public Water Supply Samples: <input type="checkbox"/> Note: All results may automatically be reported to DOH if required by State. Turn-Around-Time (TAT) <small>Please call ahead for large projects and/or turn around times 8 hours or less. 32 hour TAT available for select tests only, samples must be submitted by 11:30am.</small> <input type="checkbox"/> 3 Hour <input type="checkbox"/> 6 Hour <input checked="" type="checkbox"/> 24 Hour <input type="checkbox"/> 32* Hour <input type="checkbox"/> 48 Hour <input type="checkbox"/> 72 Hour <input type="checkbox"/> 96 Hour <input type="checkbox"/> 1 Week <input type="checkbox"/> 2 Week					
MICROBIOLOGY TEST CODES							
M001 Air-O-Cell M030 MICRO 5 M041 Fungal Direct Examination M169 Pollen ID & Enumeration 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) M280 Dust Characterization Level-1 M281 Dust Characterization Level-2 Add On to Spore Trap & M041 Analyses <small>*available at certain lab locations*</small> M280A Dust Characterization Level-1 M281A Dust Characterization Level-2		M174 MoldSnap M032 Allergenco-D M009 Bacteria Culture Gram Stain & Count M010 Bacteria Count & ID - 3 Most Prominent M011 Bacteria Count & ID - 5 Most Prominent M012 Pseudomonas aeruginosa (PIA***) M024 Pseudomonas aeruginosa (MFT*) M015 Heterotrophic Plate Count M017 Total Coliform & E. Coli (Coliart PIA***) M018 Total Coliform & E. Coli (MFT*) M114 Total Coliform & E. Coli Enumeration (Coliart MPN***) M019 Fecal Coliform (MFT*) M020 Fecal Streptococcus (MFT*) M029 Enterococci (MFT*) M129 Enterococci (Enterolert PIA***) M180 Real Time qPCR-ERMI 35 Panel M025 Sewage Screen - Water (MFT*)					
M115 Sewage Screen - Water (PIA***) M116 Sewage Screen - Water (MPN***) M117 Sewage Screen - Swab (PIA***) M013 Sewage Screen - Swab (MFT*) M730 Methicillin-resistant Staph. aureus (MRSA) M031 Rapid-growing non-TB Mycobacteria Detection & Enumeration M014 Endotoxin Analysis M044 Group Allergen (Cat, Dog, Cockroach, Dust Mite) M095 Bacteroides Other - See Analytical Proc Guide for Test Code Legionella Analysis Please use EMSL Legionella COC		*MFT= Membrane Filtration Technique **MPN = Most Probable Number ***PIA = Presence/Absence					
Sample #	Sample Location/Description	Sample Type (Matrix)	Potable / Non-Potable (Only for Water)	Test Code	Volume/Area	Date / Time Collected	Temperature (Lab Use Only)
Example: Sample 1	Kitchen	Water	Potable	M017	1,000 ml	1/1/2024 3:30pm	
Rm 32	center	Air		M001	75 L	2/20/25 10:25-10:30	
Door 5 Foyer	center	Air		M001	75 L	2/20/25 10:35/10:40	
Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)							
Method of Shipment: walk-in Relinquished by: Brent Barth Date/Time: 2/20/25				Sample Condition Upon Receipt: <input type="checkbox"/> Received on Ice? Check if Yes: Received by:  Date/Time: 2/20/25 Received by:  Date/Time: NE 3:23			

Consolidated Document - COC-04 Micro R16 11/29/2024

AGREE TO ELECTRONIC SIGNATURE (By checking, I consent to signing this Chain of Custody document by electronic signature)

EMSL Analytical, Inc.'s Laboratory Terms and Conditions are incorporated into this Chain of Custody by reference in their entirety. Submission of samples to EMSL Analytical, Inc. constitutes acceptance and acknowledgment of all terms and conditions by Customer.