

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

Prepared by

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

July 27, 2023

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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:

May 30 through June 5, 2023

Weather conditions for June 1, 2023

Warm. Mild Wind. Approximately 85 degrees Fahrenheit (F) around noon.

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. Delmhorst direct read for moisture in porous surfaces. IAQ 8670 direct read for carbon dioxide (CO₂), carbon monoxide (CO), relative humidity (%RH), and temperature (T). Direct read for hydrogen sulfide (H₂S) using portable 4-gas detector. All instruments calibrated before use.

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
Moisture	Direct Read	Delmhorst BD-2100
Hydrogen Sulfide	Direct Read	Portable 4-in-1 Gas Detector
Carbon Dioxide	Direct Read	TSI Model 8762
Carbon Monoxide	Direct Read	TSI Model 8762
Temperature	Direct Read	TSI Model 8762
Relative Humidity	Direct Read	TSI Model 8762

Summary of Findings, Number of Air Samples, Locations

Analysis	Number	Location(s)
Mold Spores in Air	24	B-1, B-2, B-3, B-4, B-5, M. Keller Office, Fac Rm 1 M. Carl Office, Rooms 3, 6, 11A, 12, 12A, 23, 30, 32, 34, 35, 36, 41, 42, Outdoors North, South, East and West
Moisture	Readings on walls and floors and or carpets	B-1, B-2, B-3, B-4, B-5, M. Keller Office, Fac Rm 1 M. Carl Office, Rooms 3, 6, 11A, 12, 12A, 23, 30, 32, 34, 35, 36, 41, 42, Outdoors North, South, East and West
Hydrogen Sulfide	Readings on Friday morning and First thing Monday morning	Office B3A (Pit), Classroom B4, Science Rooms 7, 8, 9, 10, 29, Art Room 30, Science Lab 38
Carbon Dioxide Carbon Monoxide Temperature Relative Humidity	Multiple reading in 20 interior locations multiple days	B-1, B-2, B-3, B-4, B-5, M. Keller Office, Fac Rm 1 M. Carl Office, Rooms 3, 6, 11A, 12, 12A, 23, 30, 32, 34, 35, 36, 41, 42, Outdoors North, South, East and West

SUMMARY OF MOLD AIR SAMPLING RESULTS

Please find the attached mold air sample laboratory report. Mold air samples were collected in 20 indoor target locations and four (4) outdoor locations around the building on June 1, 2023.

The indoor sampling locations included:

- Lower Level
 - Rooms B-1, B-2, B-3, B-4, B-5, M. Keller's Office
- Ground Level:
 - Rooms: Faculty Room 1/M. Carl's Office, 3, 6, 11A, 12, 12A, 23, 30, 32, 34, 35, 36, 41 and 42

The outdoor sampling locations included:

- The four (4) cardinal directions:
 - North Side of Building, South Side of Building, East Side of Building and West Side of Building

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 19 of the 20 ranged from "none-detected" to 430 spores per square millimeter (sp/m^3). One sample, collected in Room 36, was determined to be $1,040 \text{ sp}/\text{m}^3$. All mold specie-types found indoors were also found outdoors during the time of the study. The indoor average was $263.5 \text{ sp}/\text{m}^3$.

Outdoor air sample results ranged from 7,180 to 16,340 sp/m^3 with an average outdoor concentration of $10,757 \text{ sp}/\text{m}^3$. The outdoor average concentrations measured during this study were determined to be 40 times higher than the indoor average.

No sampling equipment malfunctions were noted during the study. Additionally, no out of place odors were noted at the time of the study. Mold spore concentrations found on sample B-18, collected in Room 36, were notably higher than all other indoor sample concentrations. Room 36 is located across the hall from the Main Entrance, and the front door to the Main Entrance was being used during the time of sampling in Room 36. Outdoor mold spore concentrations on the South side of the building, near the Main Entrance, were eight (8) times higher than the concentrations found in Room 36, which may explain why the mold spore concentrations on sample B-18 were notably higher compared to the other indoor samples.

SUMMARY OF DIRECT READ FINDINGS

Please find the attached tables containing the direct read findings taken at Richard Bernotas Middle School in Crystal Lake, Illinois from May 30th through July 5th, 2023.

The findings through the direct reading instrument indicate the indoor testing areas met target guidelines for temperature. Humidity levels ranged from within range to slightly above recommended target levels by a small margin. Porous surface moisture readings indicated “dry” conditions. The direct reading instrument suggests that H₂S, CO₂ and CO are not likely pollutant sources in the areas tested. Synopses of the findings per analytical measurement are as follows:

Moisture Readings

Moisture readings were measured on porous walls and floors in each target indoor location. Moisture readings ranged from 0.0 to 0.1, indicating “dry” conditions.

Hydrogen Sulfide

The findings through direct readings on the 4-gas meter were consistently non-detectable at the time of the study. Minor sewer gas smells were noted on Monday morning on June 1st at Office B3A (the “Pit”) but H₂S measurements were non-detectable.

Thermal Comfort

The temperature measured during the test periods met the recommended ASHRAE guidelines of 68° to 74 ° F for indoor air in a commercial building. Please reference the attached direct read table for specific measurements.

Relative Humidity

ASHRAE target guidelines for relative humidity are typically 30 – 60 % for indoor air in a commercial building. Recommendations for an individual’s comfort level may be acceptable from a low of 25% to a high of 80% relative humidity. Humidity levels in the indoor locations were within ASHRAE target levels except for on June 1st where some readings reached levels of 65%. Please reference the attached direct read table for specific measurements.

Carbon Dioxide

The testing recorded that the maximum Carbon Dioxide (CO₂) concentration measured throughout the target indoor locations was 587 parts per million (ppm). The maximum concentration was below the American Society of Heating and Air Conditioning Engineers (ASHRAE) action Level of 1,000 ppm, which is a generic guideline for acceptable IAQ. Please reference the attached direct read table for specific measurements.

Carbon Monoxide

The data from the continuous monitor showed that the Carbon Monoxide (CO) concentration indoors ranged from less than 1.0 ppm to 1.4 ppm. Target levels recommend that indoor CO levels be less than 9.0 ppm. Result during this study suggest that the potential health risk from CO is not a likely pollutant source in all areas tested indoors.

CONCLUSIONS AND RECOMMENDATIONS

Based on our air monitoring results and data, we find that the indoor target locations monitored during this study appear to be safe for occupancy and are without elevated levels of airborne irritants with regards to the constituents measured during this study. 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

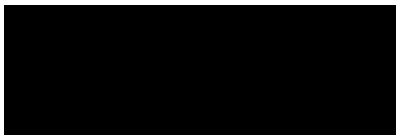
Pepper Environmental Technologies, Inc. has treated all aspects of this study as strictly confidential.

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.



Steve Soloma
Senior Project Manager

*Forms Attached:
EMSL Laboratory Report, Direct Read Findings Tables*

APPENDIX

Mold Laboratory Results & Direct Read Tables



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: 262304728
Customer ID: PEPE25
Customer PO:
Project ID:

Attention: Steve Soloma
Pepper Environmental
411 Lake Zurich Road
Barrington, IL 60010

Phone: (630) 710-3834
Fax:
Collected Date: 06/01/2023
Received Date: 06/01/2023 01:40 PM
Analyzed Date: 06/06/2023 - 06/08/2023

Project: 2200797HHH / D47 RBMS+CES

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

Lab Sample Number:	262304728-0001			262304728-0002			262304728-0003		
Client Sample ID:	B-1			B-2			B-3		
Volume (L):	75			75			75		
Sample Location:	RM B-1			RM B-2			RM B-3		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	7	300	69.8	2	90	100	3	100	100
Basidiospores	1	40	9.3	-	-	-	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	2	90	20.9	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Oidium++	-	-	-	-	-	-	-	-	-
Peronospora++	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Torula++	-	-	-	-	-	-	-	-	-
Total Fungi	10	430	100	2	90	100	3	100	100
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	3	-	-	3	-	-	2	-
Fibrous Particulate (1-4)	-	2	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

++ 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.

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%; overloaded, prohibiting accurate detection and quantification). High levels of background will obscure spores and other particulates, leading to underestimation. 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. 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. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

Samples analyzed by EMSL Analytical, Inc. Hillside, IL AIHA LAP, LLC-EMLAP Accredited #102992

Initial report from: 06/08/2023 02:16 PM

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Lab Sample Number: Client Sample ID: Volume (L): Sample Location:	262304728-0004			262304728-0005			262304728-0006		
	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
B-4				B-5			B-6		
75				75			75		
RM B-4				RM B-5			M, KELLER OFFICE		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	3	100	100	1	40	100	5	200	69
Basidiospores	-	-	-	-	-	-	2	90	31
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Oidium++	-	-	-	-	-	-	-	-	-
Peronospora++	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Torula++	-	-	-	-	-	-	-	-	-
Total Fungi	3	100	100	1	40	100	7	290	100
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	1*	10*	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	2	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

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


Andrei Poluchowicz, Microbiology Technical Manager
or other Approved Signatory

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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:	262304728-0007			262304728-0008			262304728-0009		
	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
B-7 75 FAC RM 1, M. CARL				B-8 75 RM 3			B-9 75 RM 6		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	2	90	100	9	400	95.2	2	90	50
Basidiospores	-	-	-	-	-	-	2	90	50
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	1*	10*	2.4	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	1*	10*	2.4	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Oidium++	-	-	-	-	-	-	-	-	-
Peronospora++	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Torula++	-	-	-	-	-	-	-	-	-
Total Fungi	2	90	100	11	420	100	4	180	100
Hyphal Fragment	-	-	-	1	40	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
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.

**Andrei Poluchowicz, Microbiology Technical Manager
or other Approved Signatory**

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

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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:	262304728-0010			262304728-0011			262304728-0012		
	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
B-10 75 RM 11 A				B-11 75 RM 12			B-12 75 RM 12 A		
Spore Types									
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	6	300	88.2	-	-	-	3	100	43.5
Basidiospores	1	40	11.8	-	-	-	2	90	39.1
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	1	40	17.4
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Oidium++	-	-	-	-	-	-	-	-	-
Peronospora++	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Torula++	-	-	-	-	-	-	-	-	-
Total Fungi	7	340	100	-	None Detect	-	6	230	100
Hyphal Fragment	-	-	-	-	-	-	1	40	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
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.



Andrei Poluchowicz, Microbiology Technical Manager
or other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Hillside, IL AIHA LAP, LLC-EMLAP Accredited #102992

Initial report from: 06/08/2023 02:16 PM

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



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: 262304728
Customer ID: PEPE25
Customer PO:
Project ID:

Attention: Steve Soloma
Pepper Environmental
411 Lake Zurich Road
Barrington, IL 60010


Phone: (630) 710-3834
Fax:
Collected Date: 06/01/2023
Received Date: 06/01/2023 01:40 PM
Analyzed Date: 06/06/2023 - 06/08/2023

Project: 2200797HHH / D47 RBMS+CES

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:	262304728-0013			262304728-0014			262304728-0015		
	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
B-13 75 RM 23				B-14 75 RM 30			B-15 75 RM 32		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	3	100	41.7	4	200	95.2	3	100	26.3
Basidiospores	1	40	16.7	1*	10*	4.8	3	100	26.3
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	3	100	41.7	-	-	-	2	90	23.7
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	2	90	23.7
Nigrospora	-	-	-	-	-	-	-	-	-
Oidium++	-	-	-	-	-	-	-	-	-
Peronospora++	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Torula++	-	-	-	-	-	-	-	-	-
Total Fungi	7	240	100	5	210	100	10	380	100
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
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.


Andrei Poluchowicz, Microbiology Technical Manager
or other Approved Signatory

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Project: 2200797HHH / D47 RBMS+CES

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:	262304728-0016			262304728-0017			262304728-0018		
	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
B-16 75 RM 34				B-17 75 RM 35			B-18 75 RM 36		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	1	40	3.8
Aspergillus/Penicillium	3	100	38.5	2	90	33.3	11	480	46.2
Basidiospores	2	90	34.6	1	40	14.8	10	440	42.3
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	2*	30*	11.5	1	40	14.8	1	40	3.8
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	1	40	15.4	3	100	37	1	40	3.8
Nigrospora	-	-	-	-	-	-	-	-	-
Oidium++	-	-	-	-	-	-	-	-	-
Peronospora++	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Torula++	-	-	-	-	-	-	-	-	-
Total Fungi	8	260	100	7	270	100	24	1040	100
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
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.



Andrei Poluchowicz, Microbiology Technical Manager
or other Approved Signatory

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

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Analyzed Date: 06/06/2023 - 06/08/2023
Project: 2200797HHH / D47 RBMS+CES

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:	262304728-0019			262304728-0020			262304728-0021			
	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	
B-19 75 RM 41				B-20 75 RM 42			B-21 75 OUTDOORS, WEST			
Spore Types										
Alternaria (Ulocladium)	-	-	-	-	-	-	2	90	1.3	
Ascospores	2*	30*	10.7	-	-	-	8	300	4.2	
Aspergillus/Penicillium	5	200	71.4	5	200	71.4	53	2300	32	
Basidiospores	-	-	-	1	40	14.3	59	2600	36.2	
Bipolaris++	-	-	-	-	-	-	-	-	-	
Chaetomium++	-	-	-	-	-	-	-	-	-	
Cladosporium	-	-	-	-	-	-	31	1400	19.5	
Curvularia	-	-	-	-	-	-	-	-	-	
Epicoccum	-	-	-	-	-	-	1	40	0.6	
Fusarium++	-	-	-	-	-	-	-	-	-	
Ganoderma	-	-	-	-	-	-	-	-	-	
Myxomycetes++	1*	10*	3.6	-	-	-	6	300	4.2	
Pithomyces++	-	-	-	-	-	-	-	-	-	
Rust	-	-	-	-	-	-	-	-	-	
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-	
Unidentifiable Spores	1	40	14.3	1	40	14.3	3	100	1.4	
Nigrospora	-	-	-	-	-	-	-	-	-	
Oidium++	-	-	-	-	-	-	-	-	-	
Peronospora++	-	-	-	-	-	-	-	-	-	
Polythrincium	-	-	-	-	-	-	1	40	0.6	
Torula++	-	-	-	-	-	-	1*	10*	0.1	
Total Fungi	9	280	100	7	280	100	165	7180	100	
Hyphal Fragment	-	-	-	-	-	-	1	40	-	
Insect Fragment	-	-	-	-	-	-	-	-	-	
Pollen	1*	10*	-	-	-	-	5	200	-	
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-	
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-	
Skin Fragments (1-4)	-	2	-	-	2	-	-	1	-	
Fibrous Particulate (1-4)	-	1	-	-	2	-	-	1	-	
Background (1-5)	-	1	-	-	1	-	-	1	-	

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



Andrei Poluchowicz, Microbiology Technical Manager
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Project: 2200797HHH / D47 RBMS+CES

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:	262304728-0022 B-22 75 OUTDOORS, NORTH			262304728-0023 B-23 75 OUTDOORS, EAST			262304728-0024 B-24 75 OUTDOORS, SOUTH		
	Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³
Alternaria (Ulocladium)	4*	50*	0.5	2	90	0.6	1	40	0.5
Ascospores	14	610	5.5	17	740	4.5	14	610	7.2
Aspergillus/Penicillium	102	4450	40.4	157	6850	41.9	72	3100	36.5
Basidiospores	68	3000	27.2	67	2900	17.7	52	2300	27.1
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	47	2100	19.1	113	4930	30.2	45	2000	23.5
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	1*	10*	0.1
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	1	40	0.2	-	-	-
Myxomycetes++	16	700	6.4	17	740	4.5	5	200	2.4
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	2	90	0.8	2*	30*	0.2	-	-	-
Nigrospora	-	-	-	1*	10*	0.1	-	-	-
Oidium++	-	-	-	-	-	-	4	200	2.4
Peronospora++	-	-	-	1*	10*	0.1	-	-	-
Polythrincium	1*	10*	0.1	-	-	-	-	-	-
Torula++	-	-	-	-	-	-	1	40	0.5
Total Fungi	254	11010	100	378	16340	100	195	8500	100
Hyphal Fragment	1*	10*	-	1	40	-	1	40	-
Insect Fragment	1	40	-	1	40	-	-	-	-
Pollen	2	90	-	15	660	-	4	200	-
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	-	-	2	-
Background (1-5)	-	1	-	-	1	-	-	1	-

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



Andrei Poluchowicz, Microbiology Technical Manager
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**COMFORT FACTOR MEASUREMENTS
CRYSTAL LAKE ELEMENTARY SCHOOL DISTRICT 47
RICHARD BERNOTAS MIDDLE SCHOOL
CRYSTAL LAKE, ILLINOIS
MAY 30 - JUNE 1, 2023**



LOCATION	DATE AND TIME	TEMPERATURE (°F)	RELATIVE HUMIDITY (%)	CARBON DIOXIDE (ppm)	CARBON MONOXIDE (ppm)
B-1	5/30/23 ~2PM	69	48	0.7	544
	5/31/23 ~7:30AM	72	54	0.7	419
	5/31/23 ~10:30AM	72	54	0.0	440
	6/1/23 ~9:00AM	71	62	1.2	540
	6/1/23 ~12:00PM	73	59	1.0	528
B-2	05/30/2023 ~2PM	69	47	0.6	500
	5/31/23 ~7:30AM	71	26	0.7	422
	5/31/23 ~10:30AM	71	55	0.0	430
	6/1/2023 ~9:00AM	70	61	0.7	500
	6/1/2023 ~12:00PM	72	59	0.7	507
B-3	05/30/2023 ~2PM	71	46	0.5	555
	5/31/23 ~7:30AM	72	52	0.7	439
	5/31/23 ~10:30AM	72	57	0.7	488
	6/1/23 ~9:00AM	71	60	0.7	490
	6/1/23 ~12:00PM	71	60	0.7	471
B-4	05/30/2023 ~2PM	70	46	0.5	497
	5/31/23 ~7:30AM	71	54	0.7	431
	5/31/23 ~10:30AM	71	57	0.7	483
	6/1/23 ~9:00AM	70	61	0.7	495
	6/1/23 ~12:00PM	71	60	0.7	464
B-5	05/30/2023 ~2PM	69	47	0.7	577
	5/31/23 ~7:30AM	71	62	0.6	488
	5/31/23 ~10:30AM	71	57	0.6	472
	6/1/23 ~9:00AM	69	62	0.7	499
	6/1/23 ~12:00PM	70	62	0.7	478
M. KELLER OFFICE (BASEMENT)	05/30/2023 ~2PM	71	45	0.2	515
	5/31/23 ~7:30AM	72	56	0.9	430
	5/31/23 ~10:30AM	72	59	0.3	413
	6/1/23 ~9:00AM	71	66	0.7	470
	6/1/23 ~12:00PM	73	61	0.7	485
FACULTY ROOM 1 M. CARL OFFICE (FIRST FLOOR)	05/30/2023 ~2PM	71	46	0.3	470
	5/31/23 ~7:30AM	72	50	0.5	450
	5/31/23 ~10:30AM	72	52	0.5	505
	6/1/23 ~9:00AM	71	63	1.4	512
	6/1/23 ~12:00PM	72	62	0.7	542

**COMFORT FACTOR MEASUREMENTS
CRYSTAL LAKE ELEMENTARY SCHOOL DISTRICT 47
RICHARD BERNOTAS MIDDLE SCHOOL
CRYSTAL LAKE, ILLINOIS
MAY 30 - JUNE 1, 2023**



LOCATION	DATE AND TIME	TEMPERATURE (°F)	RELATIVE HUMIDITY (%)	CARBON DIOXIDE (ppm)	CARBON MONOXIDE (ppm)
3	05/30/2023 ~2PM	71	46	0.3	470
	5/31/23 ~7:30AM	71	50	0.7	438
	5/31/23 ~10:30AM	72	52	0.6	432
	6/1/23 ~9:00AM	71	63	1.1	462
	6/1/23 ~12:00PM	72	61	0.7	485
6	05/30/2023 ~2PM	71	47	0.6	453
	5/31/23 ~7:30AM	72	50	0.5	424
	5/31/23 ~10:30AM	72	53	0.6	509
	6/1/23 ~9:00AM	71	63	0.7	480
	6/1/23 ~12:00PM	72	61	0.7	469
11A	05/30/2023 ~2PM	71	47	0.4	428
	5/31/23 ~7:30AM	72	52	0.6	459
	5/31/23 ~10:30AM	72	52	0.6	509
	6/1/23 ~9:00AM	73	58	0.0	460
	6/1/23 ~12:00PM	72	65	0.7	413
12	05/30/2023 ~2PM	72	49	0.5	437
	5/31/23 ~7:30AM	72	57	0.5	440
	5/31/23 ~10:30AM	72	58	0.6	407
	6/1/23 ~9:00AM	73	65	0.0	439
	6/1/23 ~12:00PM	72	65	0.7	413
12A	05/30/2023 ~2PM	72	49	0.4	417
	5/31/23 ~7:30AM	72	55	0.4	447
	5/31/23 ~10:30AM	72	56	0.4	422
	6/1/23 ~9:00AM	73	63	0.0	442
	6/1/23 ~12:00PM	72	60	0.7	442
23	05/30/2023 ~2PM	72	44	0.7	482
	5/31/23 ~7:30AM	72	47	0.6	440
	5/31/23 ~10:30AM	73	47	0.7	436
	6/1/23 ~9:00AM	73	58	0.0	480
	6/1/23 ~12:00PM	73	55	0.7	456
30	05/30/2023 ~2PM	73	42	0.5	487
	5/31/23 ~7:30AM	73	52	0.5	424
	5/31/23 ~10:30AM	73	51	0.7	434
	6/1/23 ~9:00AM	73	56	0.0	455
	6/1/23 ~12:00PM	73	55	0.7	452

**COMFORT FACTOR MEASUREMENTS
CRYSTAL LAKE ELEMENTARY SCHOOL DISTRICT 47
RICHARD BERNOTAS MIDDLE SCHOOL
CRYSTAL LAKE, ILLINOIS
MAY 30 - JUNE 1, 2023**



LOCATION	DATE AND TIME	TEMPERATURE (°F)	RELATIVE HUMIDITY (%)	CARBON DIOXIDE (ppm)	CARBON MONOXIDE (ppm)
32	05/30/2023 ~2PM	73	43	0.5	444
	5/31/23 ~7:30AM	73	46	0.5	422
	5/31/23 ~10:30AM	73	49	0.6	458
	6/1/23 ~9:00AM	74	54	0.0	485
	6/1/23 ~12:00PM	74	53	0.7	456
34	05/30/2023 ~2PM	71	42	0.7	471
	5/31/23 ~7:30AM	71	45	0.7	417
	5/31/23 ~10:30AM	72	47	0.7	413
	6/1/23 ~9:00AM	73	52	0.0	459
	6/1/23 ~12:00PM	72	55	0.6	444
35	05/30/2023 ~2PM	71	41	0.7	544
	5/31/23 ~7:30AM	72	45	0.4	431
	5/31/23 ~10:30AM	72	46	0.6	450
	6/1/23 ~9:00AM	73	52	1.1	440
	6/1/23 ~12:00PM	73	52	0.7	453
36	05/30/2023 ~2PM	71	45	0.6	436
	5/31/23 ~7:30AM	43	48	0.6	436
	5/31/23 ~10:30AM	73	51	0.5	439
	6/1/23 ~9:00AM	73	54	0.4	454
	6/1/23 ~12:00PM	74	53	0.7	432
41	05/30/2023 ~2PM	74	43	0.6	509
	5/31/23 ~7:30AM	74	45	0.5	421
	5/31/23 ~10:30AM	74	48	0.7	430
	6/1/23 ~9:00AM	74	53	0.7	455
	6/1/23 ~12:00PM	74	55	0.7	448
42	05/30/2023 ~2PM	74	43	0.5	565
	5/31/23 ~7:30AM	74	51	0.4	418
	5/31/23 ~10:30AM	74	51	0.2	404
	6/1/23 ~9:00AM	75	54	0.6	460
	6/1/23 ~12:00PM	75	55	0.6	455

ppm = parts per million

**HYDROGEN SULFIDE READINGS
 CRYSTAL LAKE ELEMENTARY SCHOOL DISTRICT 47
 RICHARD BERNOTAS MIDDLE SCHOOL
 CRYSTAL LAKE, ILLINOIS
 JUNE 2 - JUNE 5, 2023**



LOCATION	DATE AND TIME	HYDROGEN SULFIDE READINGS (ppm)
Office B3A (Pit)	6/2/23 ~7:00AM Friday	0
	6/5/23 ~7AM Monday	0 (Noticeable sewer smell documented during testing)
Classroom B4	6/2/23 ~7:00AM Friday	0
	6/5/23 ~7AM Monday	0
Science Room 7	6/2/23 ~7:00AM Friday	0
	6/5/23 ~7AM Monday	0
Science Room 8	6/2/23 ~7:00AM Friday	0
	6/5/23 ~7AM Monday	0
Science Room 9	6/2/23 ~7:00AM Friday	0
	6/5/23 ~7AM Monday	0
Science Room 10	6/2/23 ~7:00AM Friday	0
	6/5/23 ~7AM Monday	0
Science Room 29	6/2/23 ~7:00AM Friday	0
	6/5/23 ~7AM Monday	0
Art Room 30	6/2/23 ~7:00AM Friday	0
	6/5/23 ~7AM Monday	0
Science Lab 38	6/2/23 ~7:00AM Friday	0 (momentary sewer smell documented during testing)
	6/5/23 ~7AM Monday	0

ppm = parts per million