LIMITED MOLD AND MOISTURE ASSESSMENT

JOHN ADAMS ELEMENTARY SCHOOL

5651 RAYBURN AVENUE
ALEXANDRIA, VIRGINIA 22311

ECS PROJECT NO. 47:11652-C2

FOR: ALEXANDRIA CITY PUBLIC SCHOOLS

FEBRUARY 23, 2022

February 23, 2022

Mr. John Contreras
Alexandria City Public Schools
1340 Braddock Place
Suite 620
Alexandria, Virginia 22314

ECS Project No. 47:11652-C2

Reference: Limited Mold and Moisture Assessment, John Adams Elementary School, 5651 Rayburn Avenue, Alexandria, Virginia

Dear Mr. Contreras:

ECS Mid-Atlantic, LLC (ECS) is pleased to provide Alexandria City Public Schools with the results of the above referenced Limited Mold and Moisture Assessment performed at John Adams Elementary School located at 5651 Rayburn Avenue in Alexandria, Virginia. This report summarizes our observations, analytical results, findings, and recommendations related to the work performed. The work described in this report was performed by ECS in general accordance with the Scope of Services described in ECS Proposal Number 47:18741-EPR and the terms and conditions of the agreement authorizing those services.

ECS appreciates this opportunity to provide Alexandria City Public Schools with our services. If we can be of further assistance to you, please do not hesitate to contact us.

Sincerely,

ECS Mid-Atlantic, LLC

Lauren E. Kesslak, CIH, CSP
Project Manager
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TABLE OF CONTENTS

PAGE

TABLE OF APPENDICES

1.0 PROJECT DESCRIPTION

The building located at 5651 Rayburn Avenue in Alexandria, Virginia is a school building known as the John Adams Elementary School. It is ECS's understanding that a moldy or musty odor has been noted in room 145. Alexandria City Public Schools (ACPS) has requested ECS to conduct a limited mold and moisture assessment to evaluate these concerns. The assessment was limited to room 145. No other materials or areas were included in this assessment.

Room 145 is an approximately 600 square foot office located within the school building. The room has a carpet floor, concrete block walls, and a floating ceiling tile ceiling system. Above the ceiling ECS observed paper thermal system insulation over fiberglass and cardboard sheeting. ECS was informed by ACPS that the room previously had a flood where the carpet was wet. ECS is unaware of the source of the flooding, the extent of the flooding, how long the carpet remained wet, or what remediation efforts were made at this time.

2.0 PURPOSE

The purpose of the Limited Mold and Moisture Assessment was to conduct visual observations and testing for mold to identify evidence of moisture-affected building materials or selective amplification of mold within tested areas of the subject building.

3.0 METHODOLOGY

ECS performed the authorized Scope of Services in general accordance with our proposal, standard industry practice(s) and methods specified by guidelines and industry standards for the identification of mold and moisture impacted building materials.

Mold and Moisture

The assessment included a non-invasive visual and olfactory survey for evidence of mold and moisture within the subject property. The assessments focused on the client-selected area indicated by Alexandria City Public Schools. The ECS site personnel observed readily accessible areas and selected building materials to evaluate visible suspect fungal growth and/or moisture impacted materials. A reasonable effort was made to identify water and mold impacted areas; however, this does not imply a guarantee that all possible reservoirs of mold were identified because mold or water-impacted building materials may be hidden by walls, flooring, partitions, etc.

Ambient temperature and relative humidity were measured during the survey using an Extech hygrometer. The purpose of these measurements was to identify elevated interior humidity levels, which could potentially support indoor mold growth or indicate ongoing moisture problems.

Fungal spore air samples were collected by means of a high volume pump and Air-O-Cell® cassettes. Samples were transported to EMSL Analytical, Inc. located in Beltsville, Maryland for analysis. EMSL Analytical, Inc. is accredited by the Environmental Microbiology Laboratory Accreditation Program, administered by the American Industrial Hygiene Association. Air samples were reported to the genus or group level according to the laboratory standard quantification procedures.

It is important to note that fungal spore samples represent a snapshot in time of a constantly changing microbiome. Environmental conditions such as temperature and humidity may influence sample results. The goal of the sampling performed was not to establish precise numerical concentrations over time, but rather to generally identify the dominant fungi in the sampled locations and the general significance of their relative concentrations as compared to outdoor concentrations or unaffected locations.

4.0 RESULTS

The following is a summary of laboratory results, measurements, findings and observations.

4.1 Mold and Moisture

ECS was informed by ACPS that the room has a musty odor that is most present on Monday mornings after the room has been closed over the weekend. ECS observed several supply and return registers within the room.

ECS observed light water staining on three ceiling tiles and approximately 3 linear feet of pipe insulation within the office. At the time of the assessment, ECS noted a musty odor mixed with Potpourri. No Potpourri or air fresheners were observed to be in active use during the assessment. No visible apparent microbial growth was observed during the assessment. ECS observed an air filtration device in the office provided to the occupants by ACPS. The filter appeared to be clean at the time of the assessment.

It is possible that the musty odor is related to the previous flooding event where the carpet was wet.

Below is a summary of the sampling data collected as part of this evaluation.

4.1.1 Temperature and Relative Humidity

The following table summarizes the indoor air temperature and relative humidity readings collected by ECS from various locations.

ECS collected temperature and relative humidity readings in room 145. The key to controlling mold growth is moisture control. The EPA recommends maintaining the relative humidity (RH) below 60%, ideally 30 to 50%, to prevent mold growth. ASHRAE recommends general temperature a range of 68 to 76°F (comfort range) assuming relative humidity is between 30 to 65% RH.

The interior temperature was within the recommended ANSI/ASHRAE ranges. The interior relative humidity was consistent with the recommended AINSI/ASHRAE RH range.

Temperature and Relative Humidity

Location	Relative Humidity (%)	Temperature (°F)
Ambient (Outside)	23	34
Room 145	32	74

4.1.2 Spore-Trap Air Samples

A fungal spore-trap air sample was collected from Room 145. Representative exterior samples were collected for comparison. The following table summarizes the results of sample analysis reported in spore counts per cubic meter of air.

Spore-Trap Sample Results

Sample Number	Sample Location	Total Fungal Spore Concentration (count/cubic meter)
1	Outside 1	140
2	Room 145	80
3	Outside 2	300

In general, indoor fungal spore concentrations in room 145 were below outdoor concentrations. One count of *Penicillium/Aspergillus* was observed from the sample within room 145 while no counts were observed in the samples collected outside. While one count is generally not considered to be a significant finding, the *Penicillium/Aspergillus* species generally growth in humid moist environments. There are currently no accepted regulatory standards or guidelines with respect to acceptable fungal levels inside buildings. It is important to note however that spore trap measurements can fluctuate rapidly and the readings reported should not be used as a definitive indication that mold and or health hazards related to mold are present or absent.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on our understanding of the purpose of the Limited Mold and Moisture Assessment, the results of laboratory analysis, and our findings and observations, ECS presents the following recommendations.

Mold and Moisture

ECS recommends the replacement or thoroughly cleaning and drying of the carpet, replacement of stained ceiling tiles, and replacement of limited areas of pipe insulation with water staining. Removal of the water stained and impacted carpet should be performed using appropriate work practices within the remediation work area using dust controls. ECS recommends that the filter in the air purifier be changed regularly.

6.0 LIMITATIONS

The conclusions and recommendations presented within this report are based upon a reasonable level of assessment within normal bounds and standards of professional practice for a site in this particular geographic setting. ECS is not responsible or liable for the discovery and elimination of hazards that may potentially cause damage, accidents, or injuries.

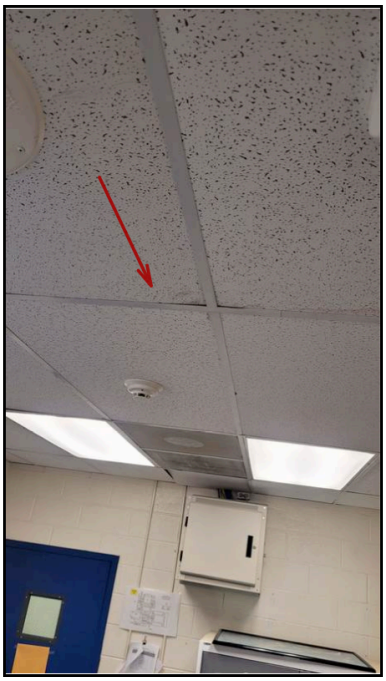
This survey is not intended to represent an exhaustive research of every potential hazard or condition that may exist, nor does it claim to represent indoor conditions or events that arise after the survey. This report has been prepared in accordance with generally accepted environmental practices. Our conclusions and findings are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided by others. The scope of services performed was limited to those requested by the Client and does not constitute a full microbial assessment of the site or a comprehensive moisture survey of the site. The data provided in this study is only indicative of conditions sampled at the immediate time of the study.

This report does not warrant against future operations or conditions, nor does it warrant against extant, or future, conditions of a type or at a location not investigated. Because of the nature of this type of work and the difficulties involved in conducting remediation work, ECS cannot guarantee that the methods or recommendations described in this report will eliminate all potential indoor air quality issues. Since performance of the remediation work is also beyond ECS scope of services, ECS also cannot be held responsible for the execution of the remediation work. The reported microbial levels are only reflective of conditions at the time of this test and that microbial populations can vary over time, depending upon a number of conditions, including environmental factors (i.e., temperature and relative humidity). The work performed in conjunction with this assessment and the data developed is intended as a description of available information at the dates and locations given.

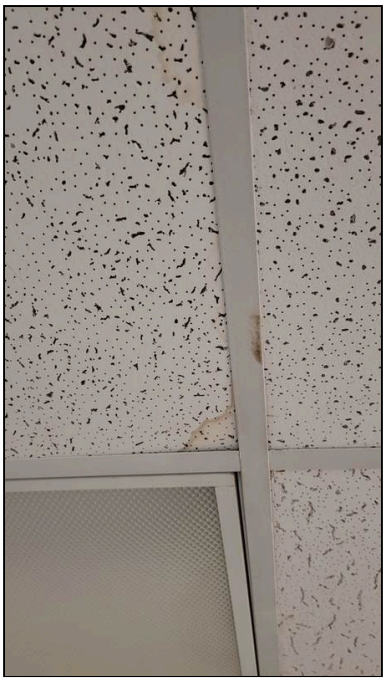
The observations, conclusions, and recommendations pertaining to environmental conditions at the subject site are necessarily limited to conditions observed, and/or materials reviewed at the time this study was undertaken. No warranty, expressed or implied, is made with regard to the conclusions and recommendations presented within this report. This report is provided for the exclusive use of the client. This report is not intended to be used or relied upon in connection with other projects or by other unidentified third parties without the written consent of ECS and the client.

Our recommendations are in part based on federal, state, and local regulations and guidelines. ECS does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies, any conditions at the site that may present a potential danger to public health, safety, or the environment. Under this scope of services, ECS assumes no responsibility regarding any response actions initiated as a result of these findings. General compliance with regulations and response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements.

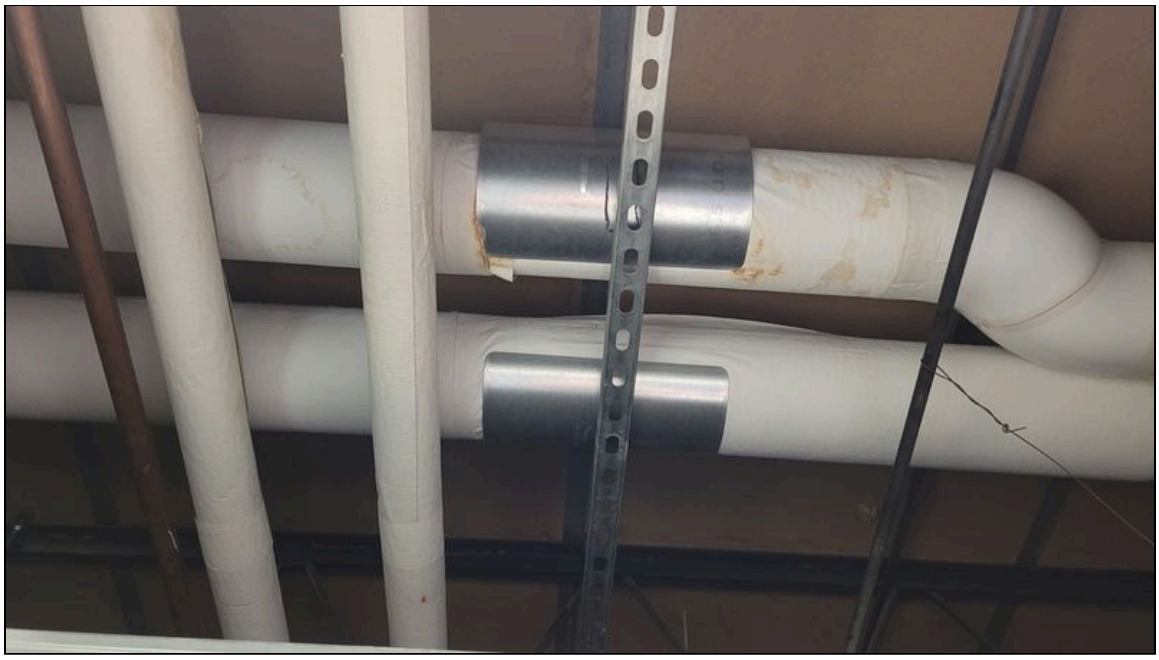
Appendix I: Site Photographs



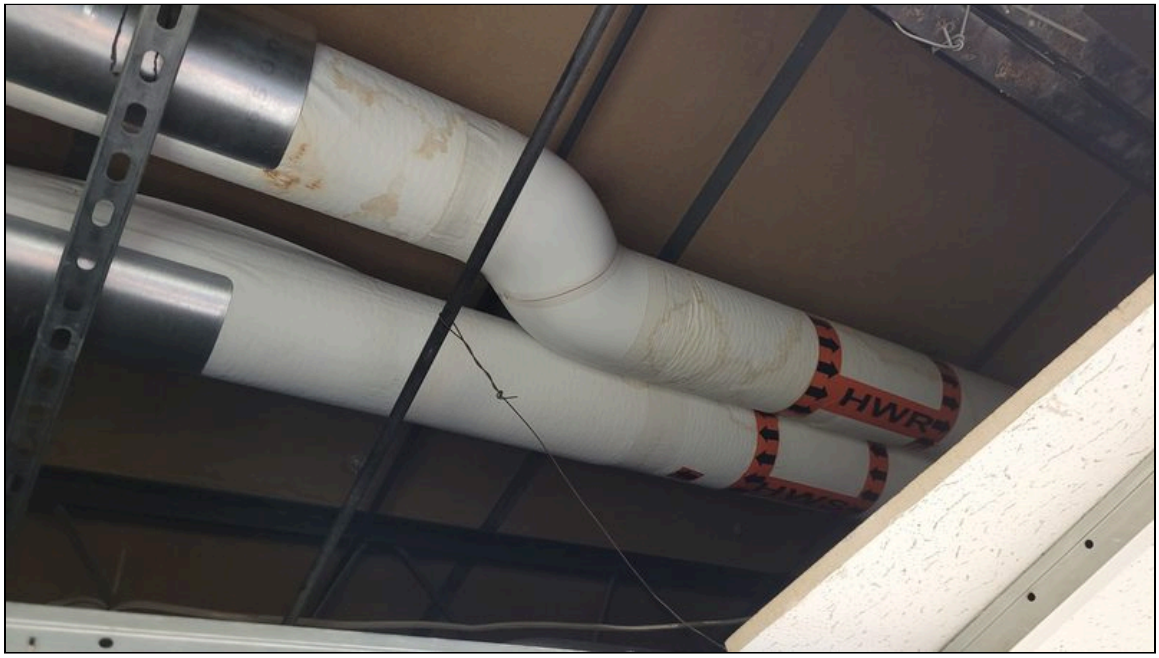
1 - View of water stained ceiling tile



2 - View of water stained ceiling tile



3 - View of water staining on pipes



4 - View of water staining on pipes

Appendix II: Air Sample Results

ACPS - Charles Barrett Elementary School
1115 Martha Custis Drive, Alexandria, Virginia
Site Visit: September 3, 2021
ECS Project No. 47:11652-I

Fungal Spore Trap Air Sample Results

Sample Number	Sample Location	Alternaria	Ascospores	Basidiospores	Botrytis	Cercospora	Cladosporium	Colorless	Curvularia	Drechslera/ Bipolaris	Epicoccum	Hyphae / Hyphal fragments	Oidium	Penicillium/ Aspergillus	Pestalotiopsis	Pithomyces	Polythrincium	Rusts	Smuts/Periconia/ Myxomycetes	Torula	Unknown/Other	Total*
1	Outdoors - Pre-Survey			40								40							100			140
2	Room 145			40										40								80
3	Outdoors, post-survey			300								40										300

All results are in spores per cubic meter (spores/m3)
Blank = None detected **Bold Red** = organisms of concern detected in greater concentrations indoors than outdooors
*Note: Total counts may not match laboratory reports due to rounding.

Appendix III: Laboratory Report(s)

OrderID: 192201040

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Microbiology Chain of Custody

EMSL Order Number *(Lab Use Only)*: 192201040

EMSL ANALYTICAL, INC.
200 ROUTE 130 NORTH
CINNAMINSON, NJ 08077
PHONE: (800) 220-3675
FAX:(856) 786-0262

Company Name: ECS	**EMSL-Bill to:** ☒ Same ☐ Different If Bill to is Different note instructions in Comments *Third Party Billing requires written authorization from third party.*
Street:	
City: Chantilly **State/Province:** VA	**Zip/Postal Code:** 20151 **Country:** USA
Report To (Name): Lauren Kosiak	**Telephone #:** 202-494-7649
Email Address: LKosiak@ecslimited.com	**Fax #:** **Purchase Order:**
Project Name/Number: 11652-[illegible] C2	**Please Provide Results:** ☐ Fax ☒ Email
U.S. State Samples Taken: **Project Zip Code:**	**Connecticut Samples:** ☐ Commercial ☐ Residential
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	M174 MoldSnap	M012 *Pseudomonas aeruginosa* (P/A***)	M115 Sewage Screen - Water (P/A***)
M030 Micro 5	M032 Allergenco-D	M024 *Pseudomonas aeruginosa* (MFT*)	M116 Sewage Screen - Water (MPN**)
M041 Fungal Direct Examination		M015 Heterotrophic Plate Count	M117 Sewage Screen - Swab (P/A***)
M169 Pollen ID & Enumeration		M017 Total Coliform & *E. coli* (Colilert P/A***)	M013 Sewage Screen - Swab (MFT*)
M280 Dust Characterization Level-1		M018 Total Coliform & *E. coli* (MFT*)	M133 *Methicillin-resistant Staph. aureus* (MRSA)
M281 Dust Characterization Level-2		M114 Total Coliform & *E. coli* Enumeration (Colilert MPN**)	M031 Rapid-growing non-TB *Mycobacteria* Detection & Enumeration
M005 Viable Fungi- Air Samples (Genus ID & Count)		M019 Fecal Coliform (MFT*)	M014 Endotoxin Analysis
M006 Viable Fungi- Air Samples (Includes *Penicillium, Aspergillus, Cladosporium, Stachybotrys* Species ID & Count)		M020 Fecal *Streptococcus* (MFT*)	M044 Group Allergen (Cat, Dog, Cockroach, Dust Mite)
M007 Culturable fungi - Surface Samples (Genus ID & Count)		M029 *Enterococci* (MFT*)	Other See Analytical Price Guide
M008 Culturable fungi - Surface Samples (Includes *Penicillium, Aspergillus, Cladosporium, Stachybotrys* Species ID & Count)		M129 *Enterococci* (Enterolert P/A***)	*Legionella* Analysis Please use EMSL *Legionella* COC
M009 Bacteria Culture Gram Stain & Count		M180 Real Time qPCR-ERMI 36 Panel	
M010 Bacteria Count & ID - 3 Most Prominent		M025 Sewage Screen –Water (MFT*)	
M011 Bacteria Count & ID - 5 Most Prominent			

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

Name of Sampler: **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)
Example A1	Kitchen Sink/Tap	Water	☒ P ☐ NP	M017	100 mL	9/1/13 4:00 PM	
1	outside	air	☐ P ☐ NP	M001	75L		
2	145	↓	☐ P ☐ NP	↓	75L		
3	outside	↓	☐ P ☐ NP	↓	75L		
			☐ P ☐ NP				
			☐ P ☐ NP				

Client Sample # (s): - **Total # of Samples:** 3 **Samples Received Chilled?** Yes / No (Lab Use Only)

Relinquished (Client): **Date:** 2-18-22 **Time:** 1:57 pm

Received (Lab): Tracy Tyler DS **Date:** **Time:**

Comments/Special Instructions:

John Adams ES

'22 FEB 18 PM 1:50

Controlled Document – COC-34 Micro R8 11/14/2017

EMSL Analytical, Inc.

10752 Baltimore Avenue Beltsville, MD 20705

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

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

EMSL Order: 192201040
Customer ID: ECMA78
Customer PO:
Project ID:

Attention: Lauren Kesslak
ECS Mid-Atlantic, LLC
14026 Thunderbolt Place
Suite 100
Chantilly, VA 20151
Project: 11652-C2

Phone: (703) 471-8400
Fax: (703) 471-8400
Collected Date: 02/18/2022
Received Date: 02/18/2022 01:50 PM
Analyzed Date: 02/18/2022 - 02/21/2022

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

Lab Sample Number:	192201040-0001			192201040-0002			192201040-0003		
Client Sample ID:	1			2			3		
Volume (L):	75			75			75		
Sample Location:	OUTSIDE			145			OUTSIDE		
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	-	-	-	1	40	50	-	-	-
Basidiospores	1	40	28.6	1	40	50	6	300	100
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	3	100	71.4	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**4**	**140**	**100**	**2**	**80**	**100**	**6**	**300**	**100**
Hyphal Fragment	1	40	-	-	-	-	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.

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

Abubakar Barry, Microbiology Laboratory Manager or other Approved Signatory

Initial report from: 02/21/2022 12:21 PM

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

Appendix IV: Mold Reference and Guidance Documents

MOLD REFERENCE DOCUMENTS AND GUIDANCE

Standards and Publications

Mold Remediation in Schools and Commercial Buildings, EPA, EPA 402-K-01-001, September 2008

A Brief Guide to Mold in the Workplace, Occupational Safety Health Administration (OSHA), SHIB 03-10-10, updated 11-08-13

ANSI/IICRC S520-2015 Standard and Reference Guide for Professional Mold Remediation, Institute of Inspection, Cleaning, and Restoration Certification, Third Edition

ANSI/IICRC S500-2021 Standard and Reference Guide for Professional Water Damage Restoration, Institute of Inspection, Cleaning, and Restoration Certification, Fifth Edition

Bioaerosols: Assessment and Control, American Conference of Governmental Industrial Hygienists, 1999.

Building Air Quality: A Guide for Building Owners and Facility Managers, National Institute for Occupational Safety and Health (NIOSH) and Environmental Protection Agency (EPA) EPA 402F-91-102, December 1991

Mold Moisture and Your Home, EPA, EPA-402-K-02-003, September 2012

WHO Guidelines for Indoor Air Quality: Dampness and Mould, World Health Organization (WHO), 2009

Guidelines on Assessment and Remediation of Fungi in Indoor Environments, New York City Department of Health and Mental Hygiene, November 2008.

Damp Buildings, Human Health, and HVAC Design, Report of the ASHRAE Multidisciplinary Task Group: Damp Buildings, American Society of Heating, Refrigerating, and Air Conditioning Engineers, 2020

Websites

EPA – Mold Resources, https://www.epa.gov/mold

Centers for Disease Control and Prevention (CDC), https://www.cdc.gov/mold/faqs.htm

Department of Energy and the Environment (DOEE), Mold Assessment and Remediation Licensure Regulations https://doee.dc.gov/service/mold-professional-licensing

Virginia Department of Health, Environmental Health, Public Health Toxicology, Mold https://www.vdh.virginia.gov/environmental-health/public-health-toxicology/mold/