MOLD AND MOISTURE ASSESSMENT REPORT

LOIS HARRISON-JONES ELEMENTARY SCHOOL

3021 MAPLEWOOD AVE
RICHMOND, VIRGINIA 23221

ECS PROJECT NO. 47:14153-J

FOR: RICHMOND PUBLIC SCHOOLS FACILITY SERVICES

FEBRUARY 26, 2024

February 26, 2024

Mr. Ronald Hathaway Jr.
Richmond Public Schools Facility Services
1461-A Commerce Road
Richmond, Virginia 23224
Rhathawa@rvaschools.net

ECS Project No. 47:14153-J

Reference: Mold and Moisture Assessment, Lois Harrison-Jones Elementary School, 3021 Maplewood Ave, Richmond, Virginia

Dear Mr. Hathaway Jr.:

ECS Mid-Atlantic, LLC (ECS) is pleased to provide Richmond Public Schools Facility Services with the results of the above-referenced Mold and Moisture Assessment performed at Lois Harrison-Jones Elementary School located at 3021 Maplewood Ave in Richmond, 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 47:47:30369-EP and the terms and conditions of the agreement authorizing those services.

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

Sincerely,

ECS Mid-Atlantic, LLC

Israel Santana, III
Environmental Project Manager
isantana@ecslimited.com
804-353-6333

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Director of Industrial Hygiene
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1.0 PROJECT DESCRIPTION

The building located at 3021 Maplewood Ave in Richmond, Virginia is a school building known as Lois Harrison-Jones Elementary School. The building contains approximately 43,984 square feet of space and was reportedly originally constructed in 1980.

Based on information provided by Richmond Public Schools Facility Services representatives, ECS understands that building occupants have reported mold and moisture concerns in the building to the Richmond Public Schools Facility Services Department. Richmond Public Schools Facility Services has requested ECS to conduct a Mold and Moisture Assessment to evaluate these concerns..

2.0 PURPOSE

The purpose of the Mold and Moisture Assessment was to conduct visual observations and testing for mold and moisture 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 practices and methods specified by guidelines and industry standards for the identification of mold and moisture-affected building materials.

3.1 Mold and Moisture

The assessment included a non-invasive visual and olfactory survey for evidence of mold and moisture within the subject building. The assessments focused on the client-selected areas indicated by Richmond Public Schools Facility Services. 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. ECS could not access the mechanical room beneath the library because no one on-site could provide access during the site visits. Additional assessment should be performed in this area to determine if mold or moisture impacted building materials are present. ECS observed two outbuildings behind the main school building. ECS did not assess these structures as part of the assessment as they were not requested to be included by the client.

Ambient temperature and relative humidity were measured during the survey using a Fluke thermo-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.

ECS measured the moisture content in various building materials in multiple locations within the surveyed areas utilizing a Protimeter brand hand-held moisture meter. The instrument may be operated in two independent modes. The non-destructive “search mode” uses radio-frequency induction to detect moisture in a substrate. Using the search mode, the Protimeter is capable of detecting moisture in solid, homogeneous materials at depths up to 10 millimeters (0.39 inches). When operated in search mode, the Protimeter produces qualitative readings (“dry”, “at risk”, “wet”)

along with a relative numerical reading corresponding to the appropriate qualitative reading. The Protimeter may also be used in "measure mode" to obtain actual moisture percentage readings in wood and other solid, non-conductive materials. Measurements are taken by inserting the pins of a moisture probe into the material being tested. For wood substrates, the moisture percentage is expressed as "% Moisture Content (MC)"; for other materials this number is expressed as "% Wood Moisture Equivalent (WME)". In general, %MC or %WME values of less than 17 are considered "dry", values greater than or equal to 17 but less than 20 are considered "at risk" for moisture damage, and values of 20 or greater are considered "wet". Values of greater than 17 % typically are considered at risk for mold growth. This was not a comprehensive moisture mapping survey of all building materials within the areas surveyed but rather a non-invasive survey of moisture in select areas of specific building materials which may be impacted by moisture.

ECS measured the moisture content in various building materials in multiple locations within the surveyed areas utilizing a Delmhorst brand hand-held moisture probe (Model BD 2100). Based on the Delmhorst moisture meter scales for materials, moisture levels greater than 0.5% are considered elevated for drywall wallboard materials and are considered at risk for mold growth. Levels greater than 15% for wood materials and greater than 85% for plaster surfaces are considered elevated. This was not a comprehensive moisture mapping survey of all building materials within the areas surveyed but rather a non-invasive survey of moisture in select areas of specific building materials which may be impacted by moisture.

Samples collected were transported/shipped to Environmental Hazards Services (EHS) located in Richmond, Virginia for analysis. EHS is an AIHA (American Industrial Hygiene Association) EMLAP (Environmental Microbiology Laboratory Accreditation Program) accredited laboratory. The samples were analyzed for total spore concentrations in accordance to the laboratory's quantification methods.

Fungal spore air samples were collected using calibrated self contained battery operated air sampling pumps and Allergenco® cassettes. Samples were transported to Environmental Hazards Services located in Richmond, Virginia for analysis. Environmental Hazards Services 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.

Based on our observations and sampling data, ECS does not see any reason why the school should not be continued to be used based on our experience with similar school buildings across the Richmond area and our findings for this study. In general, our air sample results did not indicate any significantly elevated spore trap air samples in the classrooms above outdoor comparison samples. As would be expected with any school building, new or old, areas of mold and moisture were observed and it is our understanding that the recommendations identified in the assessment reports are being addressed or will be addressed by RPSFS.

4.1 Mold and Moisture

Main School Building

- Moisture stained ceiling tiles were observed sporadically in areas throughout the hallways, classrooms, and cafeteria in areas where drop ceiling tiles are present. None of the areas tested were determined to have elevated moisture content. In general much of the staining observed on ceiling tiles was likely caused by old roof leaks, pipe or HVAC condensation leaks or general leaking pipes;
- Suspect mold was observed on the ceiling mounted fan coil units throughout the school. ECS observed heavy dust on the face of the units and suspect mold was growing from the accumulated dust.
- ECS also observe heavy mold growth on the fiberglass pipe insulation associated with the ceiling mounted fan coil units throughout the school;
- During the site visit an active water leak was occurring in the Cafeteria. Three ceiling tiles were impacted by the water leak.
- ECS observed cracked/Peeling paint on the perimeter plaster wall in room 109 . Causation appears to be a possible roof leak or water infiltrating through the exterior wall;
- ECS observed a window in room 112 having water damage possibly from a caulk failure on the exterior portion of the building;
- ECS observed the window lintel in room 203 with water damage possibly from caulk failure or a roof leak.
- The exterior wall in room 208 was observed to have bubbling/paint peeling from a previous water intrusion. Moisture reading taken from plaster was in the dry range.

Exterior Envelope

- ECS observed areas of failed asbestos containing caulk and window glaze throughout the exterior of the building. from normal age and weathering.

4.1.1 Spore-Trap Air Samples

Fungal spore-trap air samples were collected from classrooms and functionally distinct spaces in the school where students and faculty would be expected to spend the most time. 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)
A1	Outdoors, main entrance	2800
A2	Media center	530
A3	103	110
A4	104	40
A5	105	380
A6	106	380
A7	Teachers lounge	460
A8	107	450
A9	108	400
A10	109	1100
A11	110	670
A12	111	110
A13	Outdoors, main entrance	2800
A14	112	150
A15	114	480
A16	115	380
A17	116	560
A18	117	470
A19	118	800
A20	200	87
A21	201	76
A22	202	47
A23	203	310
A24	204	67
A25	205	720
A26	206	20
A27	207	27

Sample Number	Sample Location	Total Fungal Spore Concentration (count/cubic meter)
A28	208	210
A29	209	87
A30	Cafeteria	150
A31	Gymtorium	340
A32	Main office	100
A33	Speech office	310
A34	Outdoors, main entrance	620

Analytical results of the mold air testing determined that total spore counts reported in the rooms tested in the school were below the level of total airborne mold spores reported on the outside samples. The fungal genera detected were also generally comparable with fungal genera detected outdoors with the exception of room 115, 116, 117, 201, 203, and 205 which had small elevations of *Stachybotrys sp*. and other genera. Based on our observations these elevations appear related to the moisture intrusion and other mold/moisture impact observations observed.

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.

4.1.2 Temperature and Humidity

The key to understanding humidity is that warmer air can contain greater quantities of moisture than cooler air. Relative humidity is defined as the ratio of the amount of moisture contained in the air to the maximum amount of moisture the air can contain at that temperature. The dew point temperature is defined as the temperature at which the amount of moisture in the air reaches saturation. The dew point is a more accurate indication of the actual amount of moisture in the air, because it is independent of temperature.

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) has published several standards for ventilated buildings. *ANSI/ASHRAE Standard 62.1-2019, Ventilation for Acceptable Air Quality* specifies that indoor humidity should be maintained below 60 degrees Fahrenheit (°F) dew point temperature. The EPA recommends that indoor relative humidity be maintained below 60%, ideally 30-50%, to prevent mold growth. The *OSHA Technical Manual,* Section III, Chapter 2 for Indoor Air Quality Investigations specifies a thermal comfort range of 68°F to 76°F and a relative humidity range of 20% to 60% to maximize comfort for all occupants.

The following table summarizes the indoor air temperature and relative humidity readings collected by ECS during the survey.

Temperature and Relative Humidity

Location	Relative Humidity (%)	Temperature (°F)
Outdoors, main entrance	28.3	61.4
Media center	36.6	69.6
103	37.4	71.5
104	39.4	70.6
105	34.0	73.9
106	34.0	73.8
Teachers lounge	35.3	72.8
107	29.5	75.8
108	32.3	72.2
109	30.9	70.4
110	27.2	70.4
111	27.2	70.6
Outdoors, main entrance	29.4	61.4
112	32.4	69.3
114	35.5	68.4
115	34.0	69.7
116	29.1	68.2
117	35.8	72.3
118	34.8	72.2
200	32.5	72.7
201	28.8	71.4
202	31.5	72.8
203	33.3	71.8
204	37.4	71.0
205	32.5	73.4
206	33.8	73.8
207	33.8	74.8
208	33.5	73.3

Location	Relative Humidity (%)	Temperature (°F)
209	26.6	71.9
Cafeteria	30.1	72.7
Gymtorium	27.8	69.3
Main office	32.5	72.5
Speech office	31.7	72.9
Outdoors, main entrance	48.0	51.9

The temperature and relative humidity within the school class rooms and office spaces were within the EPA and ASHRAE guidelines.

4.1.3 Moisture in Building Materials

The following table summarizes moisture content readings collected.

Summary of Moisture Readings from Building Materials

Location	Building Component	Substrate Material	Moisture Content (%)
Room 109	Wall	Plaster	45.5
Room 208	Wall	Plaser	53.2

Moisture readings were taken within the wall plaster within rooms 109 and 208 where ECS observed water impacted plaster. ECS in unable to determine the source of moisture, therefore, further investigation of the source of the water intrusion is recommended. ECS speculates that the source is through exterior walls or roof leaks.

5.0 CONCLUSIONS AND RECOMMENDATIONS

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

5.1 Mold and Moisture

ECS recommends remediation be performed for all water and mold impacted materials within the surveyed areas as soon as reasonably possible. This includes all materials that have visible suspected mold and/or have been subjected to elevated moisture conditions for greater than 48 hours without proper drying efforts.

General

ECS recommends that a qualified mold remediation/drying contractor be retained to properly remove mold impacted materials. Remediation activities should be performed in general accordance with the guidelines described in EPA's March 2001 document "Mold Remediation in Schools and Commercial Buildings" and under the OSHA 2010 Guidelines for mold removal. Additional remedial guidance documents are also referenced in Section at the end of this report. Workers performing this work should wear proper personal protective equipment (PPE) including HEPA filtered respirators and disposable clothing (per OSHA standards for PPE).

ECS recommends that a building envelope study be performed for the building by a qualified engineer. Correction of building envelope and water intrusion issues should be performed prior to or concurrent with any remediation activities.

Setup

In general accordance with the EPA and OSHA guidelines, ECS recommends containment of the remediation areas using plastic barriers and tape to create negative pressure containment during removal of mold impacted materials. The contractor should seal HVAC vents in the work area(s), as well as all other penetrations and openings. A HEPA-filtered local exhaust ventilation (negative air machine) should be utilized within the work area directly adjacent to the area(s) being cleaned and should maintain negative pressure and HEPA filtration continuously inside the containment during remediation activities and prior to clearance sampling.

Scope of Work

All impacted drywall materials that have visible growth and/or have sustained water impacts should be removed in excess of 2 feet beyond the visible extent of mold or water stains where feasible. Further observation of the wall and ceiling systems may be necessary during remediation efforts to determine if additional materials will need to be removed. **As noted previously, any active moisture leaks into the building should be properly accessed and corrected prior to or concurrent with mold remediation activities. In addition, prior to performing any work the remediation contractor shall review all asbestos reports for the school building.**

ECS makes the following recommendations concerning abatement of mold and/or moisture impacted materials in the building:

- Assessment of the building envelope by a qualified engineer or contractor to determine what repairs should be made to the exterior of the building in order to properly seal the building envelope and prevent further moisture intrusion. The envelope assessment should include an assessment of the integrity of the porticos and roof throughout the building as well;
- Moisture stained ceiling tiles were observed sporadically in areas throughout the hallways, offices, cafeteria/auditorium, and kitchen in areas where drop ceiling tiles are present. None of the areas tested were determined to have elevated moisture content. In general much of the staining observed on ceiling tiles was likely caused by old roof leaks, pipe condensation or leaking pipes. Have a qualified mold remediation contractor or qualified maintenance staff remove and replace all moisture impacted ceiling tiles. Perform any mold remediation as described in this protocol above this section if needed;

- A heavy build-up of dust and dirt was observed associated with the ceiling supply vents throughout the building. Perform localized cleaning of the HVAC system and review the cleaning and maintenance schedule for the units; Use a mold remediation contractor or qualified school maintenance staff. Perform any mold remediation as described in this protocol above this section; Note: Having dust accumulation and suspect mold at the diffusers is not uncommon and is a normal preventive maintenance measure to monitor and correct.
- ECS also observed heavy mold growth on the fiberglass pipe insulation associated with the ceiling mounted fan coil units throughout the school. Have a qualified mold remediation contractor or qualified maintenance staff remove and replace all mold and moisture impacted fiberglass pipe insulation. Perform any mold remediation as described in this protocol above this section, as needed;
- During the site visit an active water leak was occurring in the Cafeteria. Three ceiling tiles were impacted by the water leak. Have a maintenance staff removed any water impacted ceiling tiles, and have a roofing contractor inspect the roof above the cafeteria for any leaks; Dry any remaining materials.
- Cracked/Peeling paint was observed on the exterior plaster wall of room 109. . Causation appears to be possible water intrusion from a roof leak or water infiltrating from the exterior wall; Repair the plaster wall and verify the area is dry and suspect mold is not present. Perform any mold remediation as described in this protocol, above this section;
- ECS observed a window in room 112 having water damage (showing peeling/rust) possibly from caulk failure on the exterior portion of the building; Repair the window casing as well as the exterior caulk/glaze failure (by an asbestos abatement contractor) to prevent further water intrusion from occurring;
- ECS observed the window lintel in room 203 with water damage possibly from caulk failure or a roof leak. Further review by a maintenance staff is recommended;
- The wall in room 208 was observed to have bubbling/paint peeling from a previous water intrusion occurring. Moisture reading taken from plaster was in the dry range. Repair the plaster wall and verify the area is dry and suspect mold is not present. Perform any mold remediation as described in this protocol, above this section;
- Repair and replace the damaged asbestos exterior window caulk/glaze and exterior vent caulk throughout the building. Any disturbance or the removal of the material will need to be performed by a Virginia licensed Asbestos Abatement Contractor. If these windows will be removed and replaced then the windows and associated caulking should be disposed of as Category II Non-Friable ACM by a licensed abatement contractor.

Note: The purpose of this survey was to evaluate areas where moisture intrusion or suspected visible mold growth has occurred and provide findings and recommendations for remedial work efforts. Identification and recommendations for correction of sources of moisture should be performed by a qualified engineer. Because of the nature of the environment, complete elimination of all microbial organisms within a building cannot be expected and is not the goal of remediation. The goal of remediation is to restore the affected materials to at least the condition of unaffected materials. It is important to note that the reported mold levels are only reflective of conditions at the time of this test and that mold populations can vary over time, depending upon a number of conditions, including

environmental factors (i.e., temperature and relative humidity). If significant mold growth reappears, or if the occupants experience prolonged allergic-type health complaints, they should seek further investigation of the problem.

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.

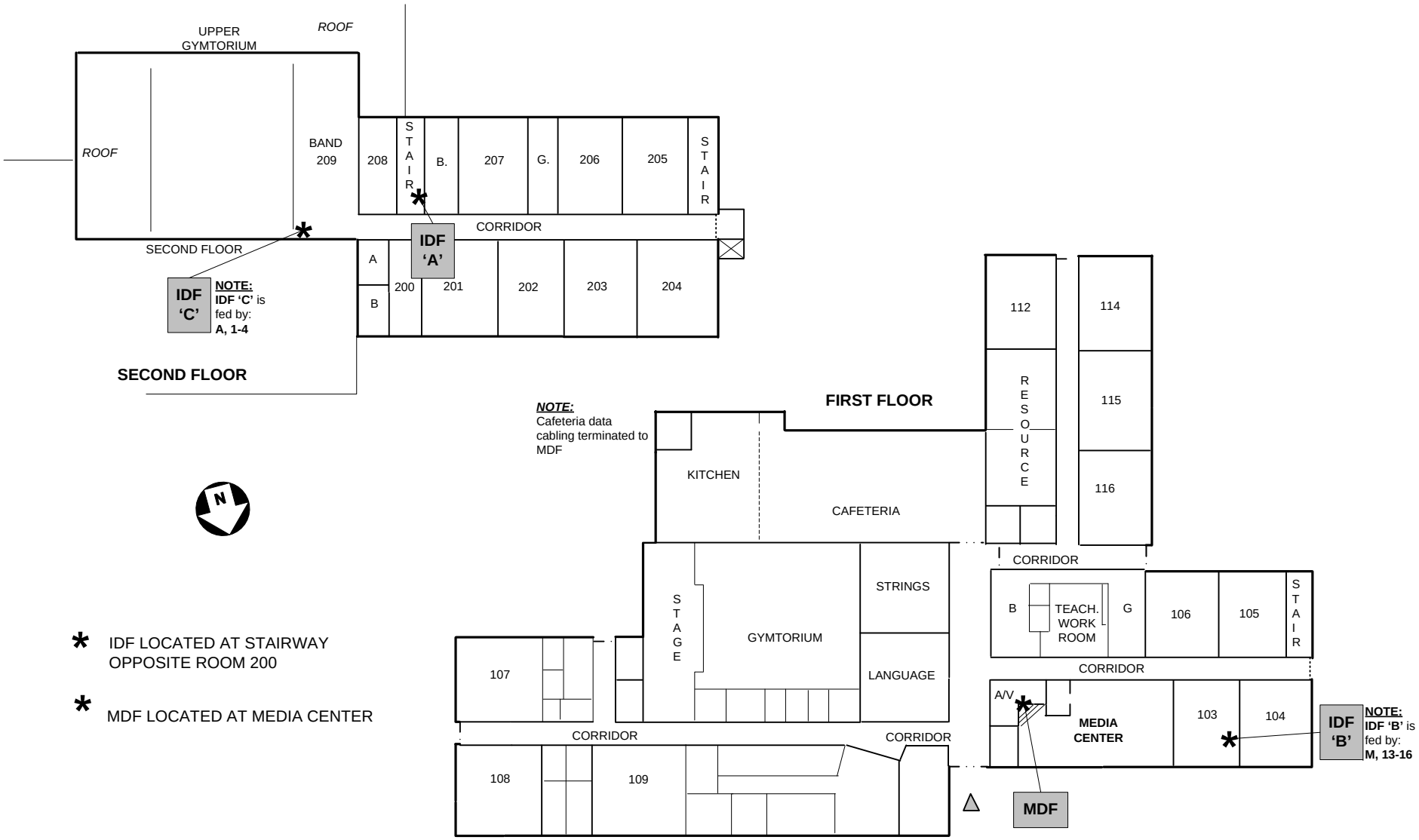
The observations, conclusions, and recommendations pertaining to environmental conditions at the subject site are necessarily limited to conditions observed, and/or materials reviewed at the time this study was undertaken. No warranty, expressed or implied, is made with regard to the conclusions and 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: School Diagram

RICHMOND PUBLIC SCHOOLS
DATA SYSTEMS CONNECTIONS AND FLOOR PLAN LAYOUT

JOHN B. CARY ELEMENTARY



Prepared: Nov. 3, 1997
Updated: August 19, 2008
File Name: CARY DATA SYS. LAYOUT RE-DRAW 08192008.vsd

Appendix II: Mold Laboratory Report

Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

Client: ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

Report Number: 23-11-02251

Received Date: 11/15/2023
Analyzed Date: 11/21/2023, 11/22/2023
Reported Date: 11/22/2023

Project/Test Address: Lois Harrison-Jones Elementary; 3021 Maplewood; Richmond, Virginia

Client Number:
200625

Fax Number:
804-353-9478

Laboratory Results

Lab # :	23-11-02251-001		23-11-02251-002		23-11-02251-003		23-11-02251-004		23-11-02251-005	
Client Sample ID :	A1		A2		A3		A4		A5	
Date Collected :	11/14/2023		11/14/2023		11/14/2023		11/14/2023		11/14/2023	
Collection Location :	OUTDOORS MAIN ENTRANCE		MEDIA CENTER		103		104		105	
Sampling Media :	Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell	
Analytical Sensitivity (spores/m3) :	6.7		6.7		6.7		6.7		6.7	
Volume (L) :	150		150		150		150		150	
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	266	1800	24	160	7	47	4	27	25	170
Penicillium/Aspergillus group spores	91	610	37	250	4	27	2	13	12	80
Aureobasidium spores	5	33	1	6.7					1	6.7
Drechslera/Bipolaris group spores	2	13	2	13						
Curvularia spores	1	6.7								
Stachybotrys spores	1	6.7	1	6.7						
Epicoccum spores	7	47	1	6.7						
Pestalotia spores	1	6.7							1	6.7
smuts, Periconia, myxomycetes	43	290	13	87	5	33			18	120
TOTAL SPORES(Spores/m3)		2800		530		110		40		380
Analyst:	Kitana Usher		Kitana Usher		Kitana Usher		Kitana Usher		Kitana Usher	

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Laboratory Results

Lab # :	23-11-02251-006		23-11-02251-007		23-11-02251-008		23-11-02251-009		23-11-02251-010	
Client Sample ID :	A6		A7		A8		A9		A10	
Date Collected :	11/14/2023		11/14/2023		11/14/2023		11/14/2023		11/14/2023	
Collection Location :	106		TEACHERS LOUNGE		107		108		109	
Sampling Media :	Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell	
Analytical Sensitivity (spores/m3) :	6.7		6.7		6.7		6.7		6.7	
Volume (L) :	150		150		150		150		150	
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	18	120	32	210	36	240	25	170	69	460
Penicillium/Aspergillus group spores	25	170	6	40	4	27	3	20	29	190
Alternaria spores							1	6.7	1	6.7
Aureobasidium spores	2	13	2	13			2	13	7	47
Drechslera/Bipolaris group spores	1	6.7			1	6.7				
Stachybotrys spores	1	6.7							1	6.7
Pithomyces spores							1	6.7	1	6.7
smuts, Periconia, myxomycetes	9	60	29	190	27	180	26	170	56	370
Bispora spores	1	6.7					2	13	2	13
TOTAL SPORES(Spores/m3)		380		460		450		400		1100
Analyst:	Kitana Usher		Kitana Usher		Kitana Usher		Kitana Usher		Kitana Usher	

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Laboratory Results

Lab # :	23-11-02251-011		23-11-02251-012		23-11-02251-013		23-11-02251-014		23-11-02251-015	
Client Sample ID :	A11		A12		A13		A14		A15	
Date Collected :	11/14/2023		11/14/2023		11/14/2023		11/14/2023		11/14/2023	
Collection Location :	110		11		OUTDOORS MAIN ENTRANCE		112		114	
Sampling Media :	Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell	
Analytical Sensitivity (spores/m3) :	6.7		6.7		6.7		6.7		6.7	
Volume (L) :	150		150		150		150		150	
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Cladosporium spores	27	180	12	80	247	1600	11	73	33	220
Penicillium/Aspergillus group spores	69	460	2	13	68	450	6	40	18	120
Alternaria spores					4	27				
Aureobasidium spores					16	110			4	27
Drechslera/Bipolaris group spores					3	20				
Curvularia spores					1	6.7				
Stachybotrys spores	1	6.7			3	20			1	6.7
Torula spores					1	6.7				
Epicoccum spores					9	60				
Cercospora spores					1	6.7				
Nigrospora spores					2	13				
smuts, Periconia, myxomycetes	4	27	2	13	62	410	5	33	15	100
Bispora spores							1	6.7	1	6.7
TOTAL SPORES(Spores/m3)		670		110		2800		150		480
Analyst:	Kitana Usher		Kitana Usher		Kitana Usher		Kitana Usher		Kitana Usher	

Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

Client: ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

Report Number: 23-11-02251

Received Date: 11/15/2023
Analyzed Date: 11/21/2023, 11/22/2023
Reported Date: 11/22/2023

Project/Test Address: Lois Harrison-Jones Elementary; 3021 Maplewood; Richmond, Virginia

Client Number: 200625

Fax Number: 804-353-9478

Laboratory Results

Lab # :	23-11-02251-016		23-11-02251-017		23-11-02251-018		23-11-02251-019		23-11-02251-020	
Client Sample ID :	A16		A17		A18		A19		A20	
Date Collected :	11/14/2023		11/14/2023		11/14/2023		11/14/2023		11/14/2023	
Collection Location :	115		116		117		118		200	
Sampling Media :	Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell	
Analytical Sensitivity (spores/m3) :	6.7		6.7		6.7		6.7		6.7	
Volume (L) :	150		150		150		150		150	
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	26	170	14	93	35	230	38	250	4	27
Penicillium/Aspergillus group spores	17	110	68	450	20	130	46	310	6	40
Aureobasidium spores	4	27								
Drechslera/Bipolaris group spores					2	13				
Curvularia spores							1	6.7		
Stachybotrys spores	3	20	1	6.7	1	6.7				
smuts, Periconia, myxomycetes	6	40	1	6.7	12	80	35	230	3	20
Bispora spores	1	6.7								
TOTAL SPORES(Spores/m3)		380		560		470		800		87
Analyst:	Kitana Usher		Kitana Usher		Kitana Usher		Kitana Usher		Kitana Usher	

Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

Client: ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

Report Number: 23-11-02251

Received Date: 11/15/2023
Analyzed Date: 11/21/2023, 11/22/2023
Reported Date: 11/22/2023

Project/Test Address: Lois Harrison-Jones Elementary; 3021 Maplewood; Richmond, Virginia

Client Number: 200625

Fax Number: 804-353-9478

Laboratory Results

Lab # :	23-11-02251-021		23-11-02251-022		23-11-02251-023		23-11-02251-024		23-11-02251-025	
Client Sample ID :	A21		A22		A23		A24		A25	
Date Collected :	11/14/2023		11/14/2023		11/14/2023		11/14/2023		11/14/2023	
Collection Location :	201		202		203		204		205	
Sampling Media :	Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell	
Analytical Sensitivity (spores/m3) :	6.7		6.7		6.7		6.7		6.7	
Volume (L) :	150		150		150		150		150	
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	2	13	1	6.7	15	100	2	13	28	190
Penicillium/Aspergillus group spores	5	33	4	27	20	130	7	47	49	330
Aureobasidium spores	1	6.7	1	6.7	3	20			1	6.7
Drechslera/Bipolaris group spores									1	6.7
Curvularia spores									1	6.7
Stachybotrys spores	1	6.7			2	13			2	13
smuts, Periconia, myxomycetes	2	13	1	6.7	6	40	1	6.7	26	170
TOTAL SPORES(Spores/m3)		73		47		310		67		720
Analyst:	Kitana Usher		Kitana Usher		Kitana Usher		Kitana Usher		Kitana Usher	

Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

Client: ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

Report Number: 23-11-02251

Received Date: 11/15/2023
Analyzed Date: 11/21/2023, 11/22/2023
Reported Date: 11/22/2023

Project/Test Address: Lois Harrison-Jones Elementary; 3021 Maplewood; Richmond, Virginia

Client Number: 200625

Fax Number: 804-353-9478

Laboratory Results

Lab # :	23-11-02251-026										
Client Sample ID :	A26										
Date Collected :	11/14/2023										
Collection Location :	206										
Sampling Media :	Air-O-Cell										
Analytical Sensitivity (spores/m3) :	6.7										
Volume (L) :	150										
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	1	6.7									
Penicillium/Aspergillus group spores	1	6.7									
Curvularia spores	1	6.7									
TOTAL SPORES(Spores/m3)		20									
Analyst:	Kitana Usher										

Sample Narratives:

(Sample 001) M02: Large amounts of particulate observed.
(Sample 013) M03: Substantial amount of particulate observed, counts may be underestimated.

Environmental Hazards Services, L.L.C

Client Number: 200625 Report Number: 23-11-02251

Project/Test Address: Lois Harrison-Jones Elementary; 3021 Maplewood; Richmond, Virginia

Method: Non-Culturable Spore Trap Examination

Reviewed By Authorized Signatory: Tasha Eaddy

Tasha Eaddy
QA/QC Clerk

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Sample location, description, volume, etc., was provided by the client. The Client is hereby notified that due to the subjective nature of fungal analysis and the growth process of fungal infestation, laboratory samples can and do change over time relative to the originally sampled material. This report shall not be reproduced except in full, without the written consent of Environmental Hazards Services, L.L.C.

ENVIRONMENTAL HAZARDS SERVICES, LLC

Mold Chain of Custody Form

Company Name	ECS Mid-Atlantic	Account #	
Company Address	2119 North Hamilton Street	City/State/Zip	Richmond/VA/23230
Phone	804-353-6333	Email	rcurran@ecslimited.com
Project / Testing Address	Lois Harrison-Jones Elementary, 3021 Maplewood Richmond, Virginia		
PO Number	47:14153-J	Collected By	Rob Curran
Collection Date & Time	11/14/23	Outside Air Temp	Indoor Air Temp
Was there any precipitation (rain, sleet or snow) 2 hours of less before taking the samples?	☐ Yes	☑ No	

Turn-Around Time: ◉ 5 Day ○ 3 Day ○ 2 Day ○ 1 Day ○ Same Day / Weekend - Must Call Ahead

SAMPLE TYPE CODES

AIR/ NON VIABLE		SPORE TRAP		SWAB SAMPLE SURFACE	
Bulk	B	Air-O-Cell	AOC	Non Porous	NP
Swab	S	Cyclex D	C	Semi Porous	SP
Bio-Tape	T	BioSIS	B	Porous	P
Wall Check	W	Micro 5	M5		

LAB NUMBER	Client Sample ID	Collection Location	Sample Type	Air Samples: Spore Trap Type	Air Samples: Air Volume (Total Liter)	Swab Samples: Surface Type (NP/SP)	Swab Samples: Area of Mold (Square Feet)	Qualitative Particulate Analysis Additional $10.00 per sample	Comments
1	A1	Outdoors, main entrance	B	AOC	150				5688763
2	A2	Media center	B	AOC	150				5688746
3	A3	103	B	AOC	150				5688775
4	A4	104	B	AOC	150				5688772
5	A5	105	B	AOC	150				5688781
6	A6	106	B	AOC	150				5688780
7	A7	Teachers lounge	B	AOC	150				5688769
8	A8	107	B	AOC	150				5688756
9	A9	108	B	AOC	150				5688758
10	A10	109	B	AOC	150				5688726
11	A11	110	B	AOC	150				5688736
12	A12	111	B	AOC	150				5688774
13	A13	Outdoors, main entrance	B	AOC	150				5688719

Released By:	Robert Curran	Date:	11/15/23	Time:	3:02pm
Signature:	Robert Curran				

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Received By: _____

Signature: _____

Date: 11/16/23 Time: 3:31 ☐ AM ☐ PM

☐ Portal Contact Added

23-11-02251

Due Date:
11/22/2023
(Wednesday)
ER

7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

ENVIRONMENTAL HAZARDS SERVICES, LLC

Mold Chain of Custody Form

Company Name	ECS Mid-Atlantic	Account #	
Company Address	2119 North Hamilton Street	City/State/Zip	Richmond/VA/23230
Phone	804-353-6333	Email	rcurran@ecslimited.com
Project / Testing Address	Lois Harrison-Jones Elementary, 3021 Maplewood Richmond, Virginia		
PO Number	47:14153-J	Collected By	Rob Curran
Collection Date & Time	11/14/23	Outside Air Temp	Indoor Air Temp
Was there any precipitation (rain, sleet or snow) 2 hours of less before taking the samples?	☐ Yes	☑ No	

Turn-Around Time: ◉ 5 Day ○ 3 Day ○ 2 Day ○ 1 Day ○ Same Day / Weekend - Must Call Ahead

SAMPLE TYPE CODES

AIR/ NON VIABLE		SPORE TRAP		SWAB SAMPLE SURFACE	
Bulk	B	Air-O-Cell	AOC	Non Porous	NP
Swab	S	Cyclex D	C	Semi Porous	SP
Bio-Tape	T	BioSiS	B	Porous	P
Wall Check	W	Micro 5	M5		

LAB NUMBER	Client Sample ID	Collection Location	Sample Type	Air Samples: Spore Trap Type	Air Samples: Air Volume (Total Liter)	Swab Samples: Surface Type (NP/SP)	Swab Samples: Area of Mold (Square Feet)	Qualitative Particulate Analysis Additional $10.00 per sample	Comments
1	A14	112	B	AOC	150				5688749
2	A15	114	B	AOC	150				5688708
3	A16	115	B	AOC	150				5688715
4	A17	116	B	AOC	150				5688776
5	A18	117	B	AOC	150				5688725
6	A19	118	B	AOC	150				5688795
7	A20	200	B	AOC	150				5688752
8	A21	201	B	AOC	150				5688744
9	A22	202	B	AOC	150				5688743
10	A23	203	B	AOC	150				5688754
11	A24	204	B	AOC	150				5688739
12	A25	205	B	AOC	150				5688702
13	A26	206	B	AOC	150				5688718

Released By:	Robert Curran	Date:	11/15/23	Time:	
Signature:	Robert Curran				

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Received By: Sadler

Signature: Sadler

Date: 11/15/23 Time: 3:21 ☐ AM ☑ PM

☐ Portal Contact Added

2251

EHS Laboratories™

Attach Laboratory Label Here

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RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

Report Number: 23-11-02252

Received Date: 11/15/2023
Analyzed Date: 11/21/2023
Reported Date: 11/22/2023

Client: ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

Project/Test Address: Lois Harrison-Jones Elementary; 3021 Maplewood; Richmond, Virginia

Client Number:
200625

Fax Number:
804-353-9478

Laboratory Results

Lab # :	23-11-02252-001		23-11-02252-002		23-11-02252-003		23-11-02252-004		23-11-02252-005	
Client Sample ID :	A27		A28		A29		A30		A31	
Date Collected :	11/14/2023		11/14/2023		11/14/2023		11/14/2023		11/14/2023	
Collection Location :	207		208		209		CAFETERIA		GYMTORIUM	
Sampling Media :	Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell		Air-O-Cell	
Analytical Sensitivity (spores/m3) :	6.7		6.7		6.7		6.7		6.7	
Volume (L) :	150		150		150		150		150	
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			8	53	1	6.7	17	110	40	270
Penicillium/Aspergillus group spores	2	13			8	53	2	13	4	27
Alternaria spores									1	6.7
Curvularia spores			2	13						
smuts, Periconia, myxomycetes	2	13	22	150	4	27	3	20	6	40
TOTAL SPORES(Spores/m3)		27		210		87		150		340
Analyst:	Kathy Fletcher		Kathy Fletcher		Kathy Fletcher		Kathy Fletcher		Kathy Fletcher	

Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

Client: ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

Report Number: 23-11-02252

Received Date: 11/15/2023
Analyzed Date: 11/21/2023
Reported Date: 11/22/2023

Project/Test Address: Lois Harrison-Jones Elementary; 3021 Maplewood; Richmond, Virginia

Client Number:
200625

Fax Number:
804-353-9478

Laboratory Results

Lab # :	23-11-02252-006		23-11-02252-007		23-11-02252-008					
Client Sample ID :	A32		A33		A34					
Date Collected :	11/14/2023		11/14/2023		11/14/2023					
Collection Location :	MAIN OFFICE		SPEECH OFFICE		OUTDOORS MAIN ENTRANCE					
Sampling Media :	Air-O-Cell		Air-O-Cell		Air-O-Cell					
Analytical Sensitivity (spores/m3) :	6.7		6.7		6.7					
Volume (L) :	150		150		150					
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	5	33	6	40	31	210				
Penicillium/Aspergillus group spores	5	33	12	80	19	130				
Alternaria spores					1	6.7				
Epicoccum spores					2	13				
Nigrospora spores					1	6.7				
smuts, Periconia, myxomycetes	5	33	28	190	39	260				
TOTAL SPORES(Spores/m3)		100		310		620				
Analyst:	Kathy Fletcher		Kathy Fletcher		Kathy Fletcher					

Sample Narratives:

(Sample 005) M02: Large amounts of particulate observed.

Environmental Hazards Services, L.L.C

Client Number: 200625 Report Number: 23-11-02252

Project/Test Address: Lois Harrison-Jones Elementary; 3021 Maplewood; Richmond, Virginia

Method: Non-Culturable Spore Trap Examination

Reviewed By Authorized Signatory: Melissa Kanode

Melissa Kanode
QA/QC Clerk

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Sample location, description, volume, etc., was provided by the client. The Client is hereby notified that due to the subjective nature of fungal analysis and the growth process of fungal infestation, laboratory samples can and do change over time relative to the originally sampled material. This report shall not be reproduced except in full, without the written consent of Environmental Hazards Services, L.L.C.

ENVIRONMENTAL HAZARDS SERVICES, LLC

Mold Chain of Custody Form

Company Name	ECS Mid-Atlantic	Account #	
Company Address	2119 North Hamilton Street	City/State/Zip	Richmond/VA/23230
Phone	804-353-6333	Email	rcurran@ecslimited.com
Project / Testing Address	Lois Harrison-Jones Elementary, 3021 Maplewood Richmond, Virginia		
PO Number	47:14153-J	Collected By	Rob Curran
Collection Date & Time	11/14/23	Outside Air Temp	Indoor Air Temp
Was there any precipitation (rain, sleet or snow) 2 hours of less before taking the samples?		☐ Yes	☑ No

Turn-Around Time: ◉ 5 Day ○ 3 Day ○ 2 Day ○ 1 Day ○ Same Day / Weekend - Must Call Ahead

SAMPLE TYPE CODES

AIR/ NON VIABLE		SPORE TRAP		SWAB SAMPLE SURFACE	
Bulk	B	Air-O-Cell	AOC	Non Porous	NP
Swab	S	Cyclex D	C	Semi Porous	SP
Bio-Tape	T	BioSiS	B	Porous	P
Wall Check	W	Micro 5	M5		

LAB NUMBER	Client Sample ID	Collection Location	Sample Type	Air Samples: Spore Trap Type	Air Samples: Air Volume (Total Liter)	Swab Samples: Surface Type (NP/SP)	Swab Samples: Area of Mold (Square Feet)	Qualitative Particulate Analysis Additional $10.00 per sample	Comments
1	A27	207	B	AOC	150				5688748
2	A28	208	B	AOC	150				5688727
3	A29	209	B	AOC	150				5688745
4	A30	Cafeteria	B	AOC	150				5688706
5	A31	Gymtorium	B	AOC	150				5688703
6	A32	Main office	B	AOC	150				5688740
7	A33	Speech office	B	AOC	150				5688793
8	A34	Outdoors, main entrance	B	AOC	150				5688767
9			B	AOC	150				
10			B	AOC	150				
11			B	AOC	150				
12			B	AOC	150				
13			B	AOC	150				

Released By:	Robert Curran	Date:	11/15/23	Time:	
Signature:	Robert Curran				

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Received By: _____

Signature: _____

Date: 11/15/23 Time: 3:21 ☐ AM ☒ PM

☐ Portal Contact Added

23-11-02252

Due Date:
11/22/2023
(Wednesday)
ER

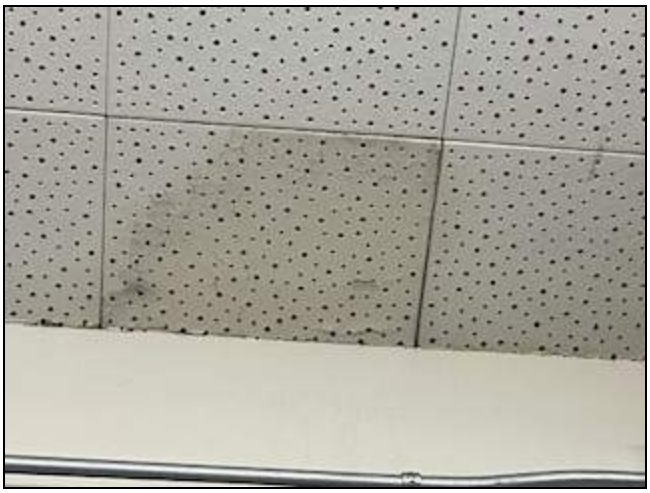
7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

Appendix III: Site Photographs

1 - General view of supply vent showing heavy dust accumulation.

2 - General view of ceiling tiles with water staining.



3 - General view of 1' x 1' ceiling tile with water staining observed.

4 - General view of ceiling mounted HVAC unit with suspect mold on supply diffuser.

5 - General view of pipe with suspect mold associated with a ceiling mounted HVAC unit.

6 - General view of pipe with suspect mold associated with a ceiling mounted HVAC unit.

7 - View of the window lintel having signs of water intrusion within room 203.

8 - Cafeteria - stained /water impacted ceiling tile showing active water leak from roof.

9 - Window in room 112 showing peeling paint possibly from water intrusion from caulk failure.

10 - View of wall bubbling/peeling paint from possible water intrusion in room 208.

11 - View of damaged ceiling tile and wall showing staining from a previous leak.

12 - View of exterior window sill with damaged caulk/sealant.

13 - View of degraded window glazing from weathering.

14 - View of damaged window glazing from weathering.

15 - View of roof drain draining against the foundation.

16 - View of exterior wall vent with caulk peeling and falling out.

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/