# SMITH & WESSEL ASSOCIATES, INC.

HAZARDOUS BUILDING MATERIALS AND AIR QUALITY SPECIALISTS

August 8, 2024

Ms. Sandra Duran **Combined Facilities Director** Town of Sudbury 275 Old Lancaster Road Sudbury, MA 01776

Re: Mold Air Sampling, Hosmer House – 299 Old Sudbury Road, Sudbury, MA

Dear Ms. Duran:

### Introduction & Summary

The Town of Sudbury retained Smith and Wessel Associates, Inc. (SWA) to perform a mold evaluation at the Hosmer House located at 299 Old Sudbury Road, Sudbury, Massachusetts. The house is historic, serves as a museum and was constructed circa 1793.

The initial assessment was conducted by Ted Sherry on September 6, 2023 after concerns arose that mold was observed on a leather book cover in the second floor art storage room. Testing was performed in the 2<sup>nd</sup> floor Art Storage room and adjacent spaces to determine for elevated moisture in building finishes and airborne mold spore levels. It was determined that elevated airborne mold spores were present in the Art Storage room as well as elevated moisture in some finishes.

Therefore, the Town contracted with Alpine Environmental, Inc. (Alpine) to remediate the Art Storage room. Alpine contained the work area and remediated all impacted finishes. Walls were opened up to evaluate for areas of water intrusion and corrective measures were implemented. In addition, a mini-split wall unit was removed and the wall patched as it was not operating correctly and thought to be in part some of the issue.

Following remediation of the space by Alpine, additional repairs were performed in an attempt to eliminate future water intrusion events. Following the work, SWA performed follow-up evaluations to determine if the work was successful. The first post remediation evaluation occurred on October 23, 2024. The airborne

TELEPHONE: (978) 346-4800 188 GREENVILLE STREET SPENCER, MA 01562 FAX: (978) 346-7265

mold spore concentrations were significantly lower and more in-line with what would be expected. SWA then waited a period of time and on November 13, 2024 conducted additional testing and normal conditions persisted in the spaces.

On August 1, 2024, Richard Bourassa conducted an annual follow up site visit for the purpose of evaluating current conditions.

### **Background & Observations**

During the August 1, 2024 assessment SWA observed a dehumidifier running in the Art Storage room and the air appeared dry and warm. No moisture was detected in any of the finishes and no visible mold growth or water staining was evident. SWA was also asked to evaluate the basement while on site. The basement was typical of such spaces during summer months and the air felt moist and musty odors were evident.

# Sampling & Analytical Methods

*Airborne Mold -* In order to assess levels of mold present in the spaces, airborne mold testing was performed utilizing a Buck BioAire Air-O-Cell<sup>TM</sup> sampling device following all manufacturers' recommended sampling procedures.

The Air-O-Cell™ is a direct-read total particulate sampling device. It is designed for the rapid collection and analysis of airborne particulates, including mold. A known volume of air, at a flow rate of 15 liters/minute, was drawn through each cassette and the filters analyzed to detect types of mold present in the air and the total number of spores. The cassettes were assigned unique sample numbers that were recorded onto a chain-of-custody form.

During the August 1, 2024 site visit, Mr. Bourassa collected five air samples that best replicated previous testing. The air samples collected including the following; one in the basement, one in the Art Storage room, one in the space outside the storage room, one in the adjacent bedroom, and one exterior comparison sample.

Laboratory results of the testing are presented as Appendix A of this report.

*Moisture Assessment* – Because elevated moisture is one of the leading causes of fungal amplification, contributes to the destruction of indoor building products, and can lead to the deterioration of buildings, SWA conducted testing of representative building finishes throughout the spaces using a General Tools moisture meter. The moisture meter is a conductance type meter that uses a two-

pin inspection mode enabling the consultant to instantly assess moisture conditions not only on a component surface, but also at depth.

The Protimeter Mini moisture meter identifies by means of green, yellow, and red LEDs whether a surface is in an air-dry (0-18%), borderline (18-22%), or damp condition (>22%) and quantifies this condition in terms of percent wood-moisture-equivalent (% WME).

#### **Findings**

Airborne Mold Results – Results of airborne mold sampling during the August 1, 2024 visit indicated that the airborne spore counts and types in the 2<sup>nd</sup> floor Art Storage room and adjacent spaces were consistent with normal conditions. However, the basement sample indicated airborne mold spores were significantly elevated at 25,840 total airborne fungi. Professional Indoor Air Quality associations such as the EPA and the American Conference of Governmental Industrial Hygienists (ACGIH) consider a space contaminated when the total mold spore levels reach or exceed 10,000 spores per cubic meter of air. The spore counts in the basement are more than twice the level deeming a space to be contaminated.

In particular, extremely high levels of Aspergillus/Penicillium spores were identified in the basement in comparison to levels noted in the outside comparison and the other indoor samples. Moderate levels of Basidiospores and

Moderate levels of Cladosporium spores were detected in the exterior comparison sample as well as lesser counts of Aspergillus/Penicillium and Ascospores.

The levels of airborne mold spores recorded during the different site visits are presented in **Table 1** below for comparison:

Table 1. Airborne Mold Levels							
Hosmer House							
299 Old Sudbury Road, Sudbury, MA							
Sample # & Location	Spores per Cubic Meter of Air						
Site Visit on 9-6-23							
(01), Floor 2 art storage room	20,900						
(02), Floor 2 main hall at stairs	480						
(03), Floor 1 dining room	370						
(04), Exterior near garage	18,690						

Table 1. Airborne Mold Levels									
Hosmer House									
299 Old Sudbury Road, Sudbury, MA									
Sample # & Location	Spores per Cubic Meter of Air								
Site Visit on 9-15-23									
(01), Floor 2 art storage room	12,800								
Site Visit on 9-19-23									
(01), Middle of the basement	670								
(02), Exterior near garage	10,360								
Site Visit on 9-29-23									
(01), Floor 2 art storage room	70,310								
(02), Area outside art storage room	14,640								
(03), Bedroom connecting to art storage	740								
(04), Exterior near garage	2,390								
Site Visit on 10-23-23 (Follo	wing Remediation)								
(01), Art storage room	200								
(02), Space outside art storage room	240								
(03), Exterior	1800								
Site Visit on 11-13-23 (Follo	wing Remediation)								
(01), Art storage room	Present								
(02), Space outside art storage room	420								
(03), Bedroom adjacent to Art Storage room	320								
(03), Exterior	340								
Site Visit on 8-1-24									
(01), Basement	25,840								
(02), Art Storage Room	440								
(03), Space Outside Storage Room	400								
(04), Bedroom, adjacent to Art Storage Rm.	160								
(05), Exterior at rear of Building	4,660								

*Moisture Findings* – SWA tested representative finishes throughout the impact areas and the majority of all finishes were determined to be within the air-dry 0-18% range. Only the basement felt dank and elicited musty odors..

## **Conclusions and Recommendations**

Based on the follow-up annual assessment conducted on August 1, 2024, SWA makes the following conclusions and recommendations:

- Elevated airborne mold spores counts were identified in the basement at 25,840 spores/m³, well exceeding the level deeming a space to be contaminated at 10,000/m³. The presence of elevated concentrations of Aspergillus/Penicillium typically indicates that conditions are optimum for mold propagation. Basements during summer months are often affected by moist conditions as warm humid air migrates into the cooler space causing the air and finishes to become damp. Dehumidifiers must be operated during warmer months to pull moisture from the air, ultimately keeping the space dry. After operating the dehumidifiers for a period of time and once cooler temperatures arrive in the area, it would be prudent to conduct follow-up testing to determine that airborne mold spore levels have normalized. It would also be prudent to have a building construction specialist review the space to determine if any other corrective measures are necessary.
- The 2<sup>nd</sup> floor Art Storage room and adjacent spaces appear to be maintaining expected levels of airborne mold spores and types following successful repairs and remediation efforts. No further concerns were noted in those spaces. However, it would be prudent to conduct annual testing to be certain conditions remain stable.
- Maintenance or other staff members must continue to perform in house visual inspections for any suspect mold growth or staining that may be indicative of water intrusion during their routine work activities. It is important to ensure that relative humidity (RH) is maintained in the indoor environment at between 30% and 60%. Promote air movement in spaces that are not readily used such as the Art Storage room as this tends to maintain dry conditions.
- Levels of both airborne mold spores and active mold growth may change at
  any given time due to changes in temperature, moisture, air pressure
  changes, and the like. This report presents the results of visual assessments
  and mold levels at the time of the assessment; it makes no claims as to the
  status of environmental conditions outside of this sampling period.

Should you have any questions or concerns please do not hesitate to contact us at your earliest convenience.

Respectfully submitted, SMITH & WESSEL ASSOCIATES INC.

Richard A. Bourassa, Jr.

Project Manager

# Appendix A

# **Laboratory Analytical Sheets**



Attention: Richard Bourassa

EMSL Order: 132404590 Customer ID: SMIT50B

Customer PO: Project ID:

**Phone**: (978) 346-4800

Fax: (978) 346-7265

**Collected Date:** 

Received Date: 08/02/2024 09:50 AM

**Analyzed Date:** 08/05/2024

Project: 24220 / Hosmer House

188 Greenville Street

Spencer, MA 01562

Smith & Wessel Associates, Inc.

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):	O-Cell(™) Analysis of Fungal Spores & Partic 132404590-0001 824-A01 75			132404590-0002 824-A02 75			132404590-0003 824-A03 75			
Sample Location:		Basement		Art Storage Room			Space Outside Art Storage			
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	0.2	1	40	9.1	3	100	25	
Aspergillus/Penicillium++	105(630)	25800	99.8	9	400	90.9	7	300	75	
Basidiospores	-	-	-	-	-	-	-	-	-	
Bipolaris++	-	-	-	-	-	-	-	-	-	
Chaetomium++	-	-	-	-	-	-	-	-	-	
Cladosporium	-	-	-	-	-	-	-	-	-	
Curvularia	-	-	-	-	-	-	-	-	-	
Epicoccum	-	-	-	-	-	-	-	-	-	
Fusarium++	-	-	-	-	-	-	-	-	-	
Ganoderma	-	-	-	-	-	-	-	-	-	
Myxomycetes++	-	-	-	-	-	-	-	-	-	
Pithomyces++	-	-	-	-	-	-	-	-	-	
Rust	-	-	-	-	-	-	-	-	-	
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-	
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-	
Unidentifiable Spores	-	-	-	-	-	-	-	-	-	
Zygomycetes	-	-	-	-	-	-	-	-	-	
Total Fungi	631	25840	100	10	440	100	10	400	100	
Hyphal Fragment	1	40	-	-	-	-	-	-	-	
Insect Fragment	-	-	-	-	-	-	-	-	-	
Pollen	-	-	-	-	-	-	-	-	-	
Analyt. Sensitivity 600x	-	41	-	-	41	-	-	41	-	
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-	
Skin Fragments (1-4)	-	1	-	-	1	-	-	1	-	
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-	
Background (1-5)	-	4	-	-	2	-	-	2	-	

† Due to method stopping rules, extrapolated raw counts are reported in parenthesis.

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

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

Steve Grise, Laboratory Manager or other Approved Signatory

EMSL Analytical, Inc. maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. EMSL Analytical, Inc. bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. Skin Fragment and Fibrous Particulate ratings are based on the percent of non-fungal material they represent: 1 (1-25%), 2 (26-50%), 3 (51-75%), or 4 (76-100%). Background ratings are based on the total area covered by non-fungal particles: 1 (1-25%), 2 (26-50%), 3 (51-75%), 4 (76-99%), or 5 (100%; overloaded). High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts >= 100 are extrapolated based on the percentage analyzed.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA AIHA LAP, LLC-EMLAP Accredited #180179

Initial report from: 08/05/2024 09:58 AM



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Lab Sample Number: Client Sample ID: Volume (L): Sample Location:	O-Cell(™) Analysis of Fungal Spores & Partici 132404590-0004 824-A04 75 Bedroom adj. to Art Storage Room			132404590-0005 824-A05 75					
Spore Types	Raw Count†	Count/m <sup>3</sup>	% of Total	Raw Count†	Exterior Count/m³	% of Total			
Alternaria (Ulocladium)	- Taw County	-	70 OI TOTAL	- Taw County		' -			+
Ascospores	_	-	_	8	300	6.4	_		
Aspergillus/Penicillium++	2	80	50	3	100	2.1			
Basidiospores	-	-	-	51	2100	45.1	_		
Bipolaris++	-	-	-	-	-	-			
Chaetomium++	-	-	-	-	-	-	_		
Cladosporium	1	40	25	47	1900	40.8			
Curvularia	1	40	25	-	-	-	-		
Epicoccum	-	-	-	2	80	1.7			
Fusarium++	-	-	-	-	-	-	-		
Ganoderma	-	-	-	3	100	2.1			
Myxomycetes++	-	-	-	-	-	-	-		
Pithomyces++	-	-	-	2	80	1.7			
Rust	-	-	-	-	-	-	-		
Scopulariopsis/Microascus	-	-	-	-	-	-			
Stachybotrys/Memnoniella	-	-	-	-	-	-	-		
Unidentifiable Spores	-	-	-	-	-	-			
Zygomycetes	-	-	-	-	-	-	-		
Total Fungi	4	160	100	116	4660	100			
Hyphal Fragment	-	-	-	-	-	-	-		
Insect Fragment	-	-	-	-	-	-			
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	41	-	-	41	-			
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-		
Skin Fragments (1-4)	-	1	-	-	-	-			
Fibrous Particulate (1-4)	-	1	-	-	1	-	-		
Background (1-5)	-	1	-	-	1	-			

† Due to method stopping rules, extrapolated raw counts are reported in parenthesis.

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

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