RPF Environmental
TESTING & CONSULTING SERVICES
Hazardous Materials Inspection & Assessment
Asbestos, Mold, Lead Paint, Radon, PCBs
Air Quality Testing and Investigations
Industrial Hygiene, Safety & Training

January 25, 2022

Mr. Matt Bennett
Director of Facilities
Amesbury Public Schools
5 Highland Street
Amesbury. MA 01913-2215

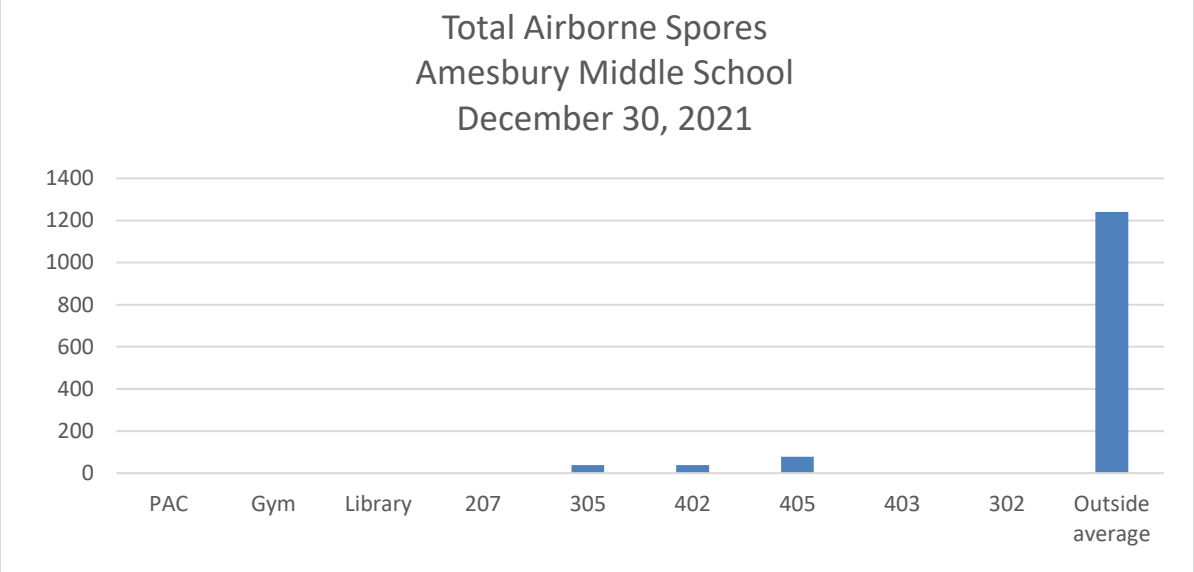
Re: Baseline Mold Testing Survey
Amesbury Public Schools
RPF Project No. 21.0881

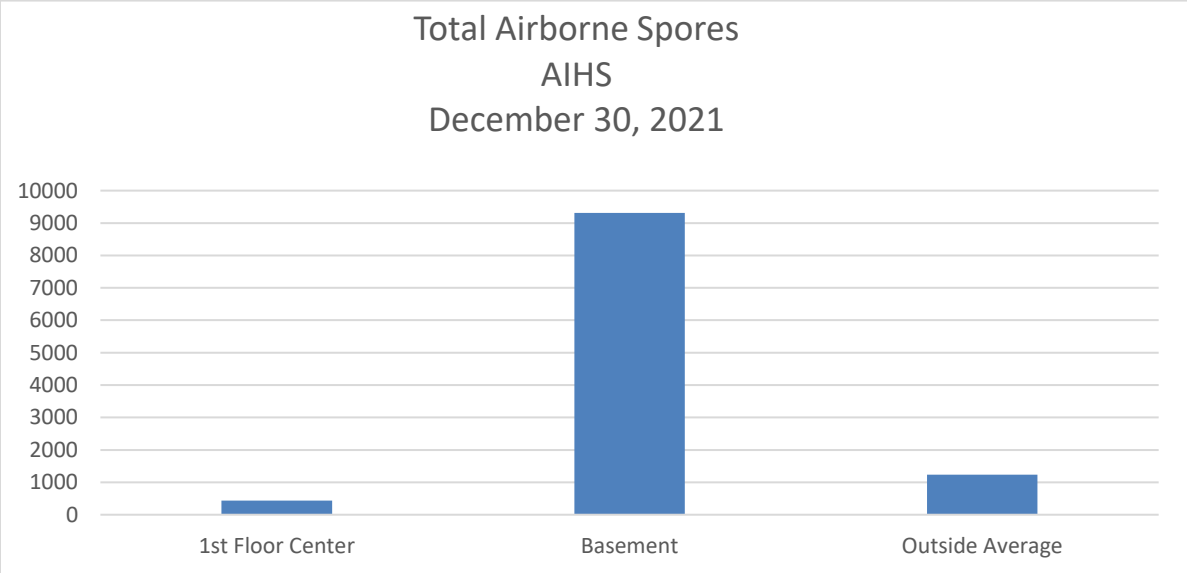
Dear Mr. Bennett:

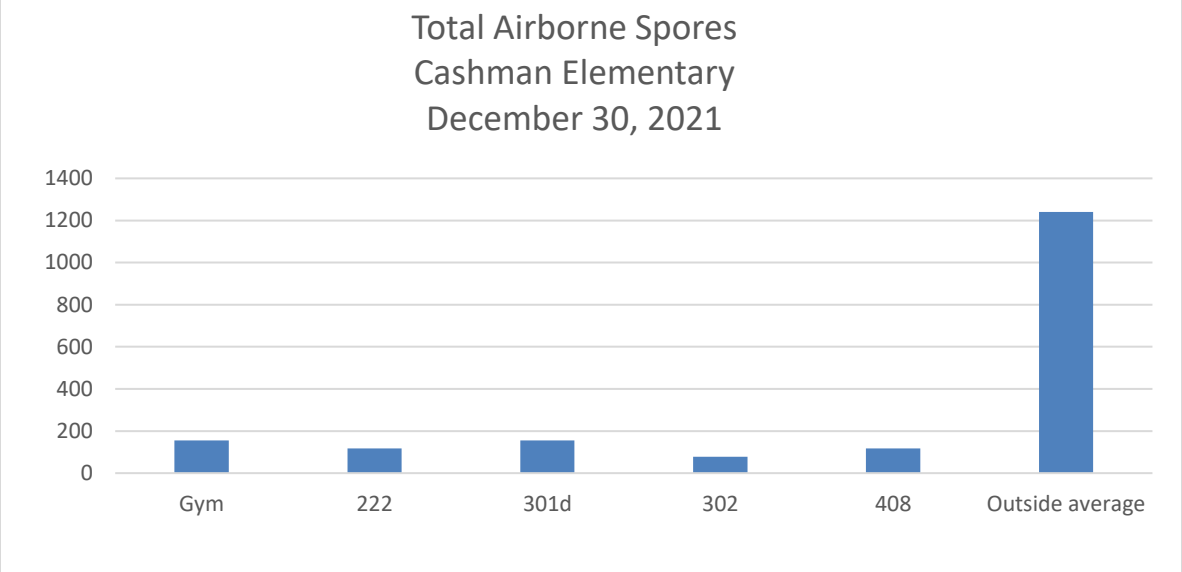
At the request of your office and in accordance with our verbal scope of work, RPF Environmental, Inc. (RPF) completed post-remediation indoor air quality (IAQ) testing for the five schools in the Amesbury Public School system. Sampling and analysis were then conducted for airborne fungal spores on December 30, 2021, during winter vacation while the schools were void of students and teachers. The results of this round of testing are presented in the following report and attached tables with actual laboratory analytical results contained in Appendix A. This report is subject to the limitations presented in Appendix B.

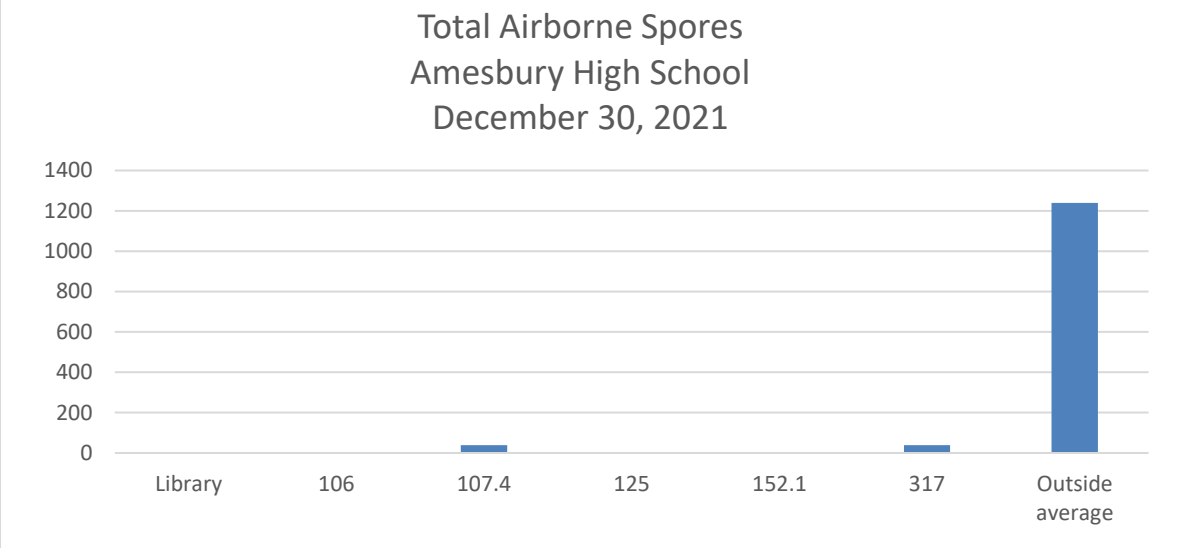
OBSERVATIONS AND SUMMARY

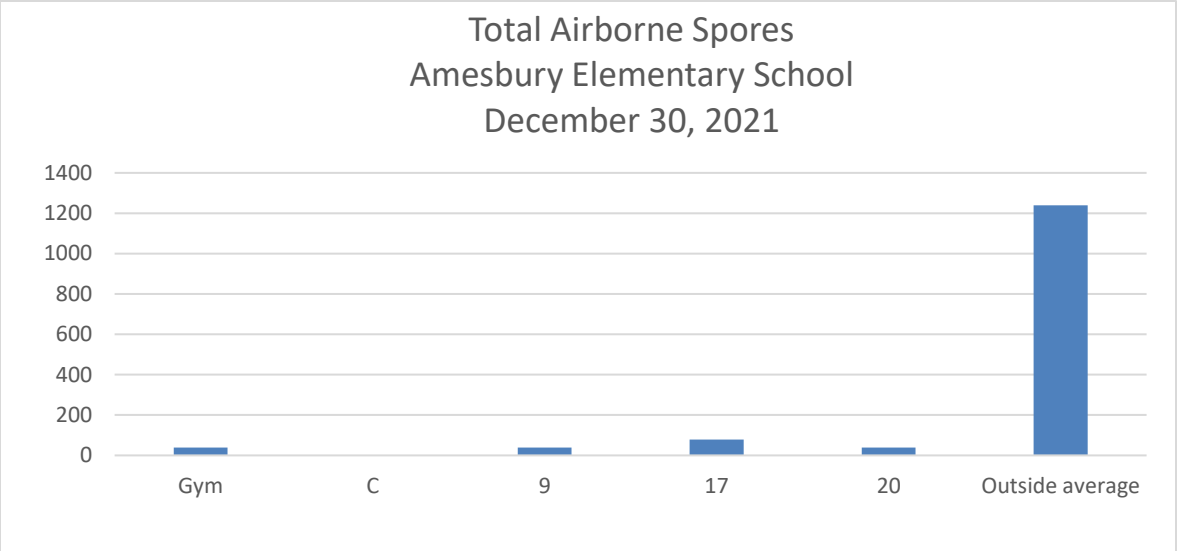
There are currently no regulatory methods or exposure limits for airborne spores or fungal metabolites for indoor air quality. General guidelines indicate that the indoor and outdoor concentrations should be similar for unaffected buildings. However, elevated concentrations of fungi and their various metabolic by-products can lead to allergic or sensitization reactions, toxic reactions to metabolites, and infections in susceptible populations of people. For those buildings with symptoms, inside airborne concentrations are typically elevated above the outdoor concentrations. In addition, the species documented inside and outside of the structure should be similar and the identification of species found in the indoor air sample(s) and not found in the outdoor air sample(s) would be indicative of the building as a likely source of contamination. The results are summarized below. Fewer outdoor controls were collected then planned to due snow cover and rain which minimizes airborne spores outside.


Total Airborne Spores
Amesbury Middle School
December 30, 2021
1400
1200
1000
800
600
400
200
0
PAC
Gym
Library
207
305
402
405
403
302
Outside average


Total Airborne Spores
AIHS
December 30, 2021
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
1st Floor Center
Basement
Outside Average


Total Airborne Spores
Cashman Elementary
December 30, 2021
1400
1200
1000
800
600
400
200
0
Gym
222
301d
302
408
Outside average


Total Airborne Spores
Amesbury High School
December 30, 2021
1400
1200
1000
800
600
400
200
0
Library
106
107.4
125
152.1
317
Outside average



Overall, the indoor total fungal spore airborne concentrations were low and are considered acceptable. The exception was the Amesbury Innovative High School's basement where the fungal spores in air were elevated. The basement for this building appears to be just used for storage and is in disarray and cleaning is recommended. Once cleaned signs of moisture and fungal growth can be reviewed. The predominant species in the basement were aspergillus-penicillium spores which were not found in the outdoor samples.

If you have any questions or require additional information on any sample results or recommendations, please feel free to contact our office. Thank you for utilizing the services of RPF for this important project.

Sincerely,
RPF ENVIRONMENTAL, INC.

Dennis N. Francoeur Jr., CIH CSP CMI
Principal

Enclosures: Appendix A: Testing Results
Appendix B: Limitations and Methodologies
Appendix C: Fungal Spore Summary

21.0881 Amesbury Public Schools IAQ 123021

APPENDIX A

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Client: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Dennis Francoeur

Project: Amesbury 210881 AES

Lab Order ID: 71982720
Analysis ID: 71982720_STA
Date Received: 01/04/2022
Date Reported: 01/07/2022

Sample ID	#1			#2			9			**EXTERIOR**		
Lab Sample ID	71982720_STA_001			71982720_STA_002			71982720_STA_003			**AVERAGE**		
Description	Gym			C Room			9			**N/A**		
Lab Notes										**N/A**		
Volume(L)	150			150			150			**N/A**		
Analytical Sensitivity (counts/m³)	39			39			39			**N/A**		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Ascospores												
Basidiospores							1	39.0	100.%			
Cladosporium	1	39.0	100.%									
TOTAL	**1**	**39.0**	**100.%**	**<1**	**<39.2**	**N/A**	**1**	**39.0**	**100.%**	**-**	**-**	**-**
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal Fragments	-	-	-	-	-	-	-	-	-	-	-	-
Insect Parts	-	-	-	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-	-	-	-
Skin Cell % of Total Debris	**80-100%**			**80-100%**			**80-100%**			**N/A**		
Total Debris in Background	**60-80%**			**80-100%**			**20-40%**			**N/A**		

No Spores Detected

Palmer Hines (6)

Analyst

Approved Signatory

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Client: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Dennis Francoeur

Project: Amesbury 210881 AES

Lab Order ID: 71982720
Analysis ID: 71982720_STA
Date Received: 01/04/2022
Date Reported: 01/07/2022

Sample ID	17			20			21			**EXTERIOR**		
Lab Sample ID	71982720_STA_004			71982720_STA_005			71982720_STA_006			**AVERAGE**		
Description	17			20			Blank			**N/A**		
Lab Notes										**N/A**		
Volume(L)	150			150			0			**N/A**		
Analytical Sensitivity (counts/m³)	39			39			1			**N/A**		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Ascospores	1	39.0	50.0%	1	39.0	100.%						
Basidiospores	1	39.0	50.0%									
Cladosporium												
TOTAL	**2**	**78.0**	**100.%**	**1**	**39.0**	**100.%**	**<1**	**<1.00**	**N/A**	**-**	**-**	**-**
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal Fragments	-	-	-	-	-	-	-	-	-	-	-	-
Insect Parts	-	-	-	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-	-	-	-
Skin Cell % of Total Debris	**80-100%**			**80-100%**			**0%**			**N/A**		
Total Debris in Background	**60-80%**			**40-60%**			**0%**			**N/A**		

No Spores Detected

Disclaimer: This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. Unless otherwise noted blank sample correction was not performed on analytical results. Scientific Analytical Institute participates in the AIHA EMPAT program for fungi. EMPAT Laboratory ID: 173190. Reporting Limit equals Analytical Sensitivity. Unless indicated, areas and volumes were provided by the customer.

Palmer Hines (6)

Analyst

Approved Signatory

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Client: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Dennis Francoeur

Project: Amesbury 210881 AHS

Lab Order ID: 71982725
Analysis ID: 71982725_STA
Date Received: 01/04/2022
Date Reported: 01/07/2022

Sample ID	Lib			106			107.4			EXTERIOR		
Lab Sample ID	71982725_STA_001			71982725_STA_002			71982725_STA_003			AVERAGE		
Description	Library			106			107.4			N/A		
Lab Notes										N/A		
Volume(L)	150			150			150			N/A		
Analytical Sensitivity (counts/m³)	39			39			39			N/A		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Ascospores												
Basidiospores							1	39.0	100.%			
	No Spores Detected			**No Spores Detected**								
TOTAL	**<1**	**<39.2**	**N/A**	**<1**	**<39.2**	**N/A**	**1**	**39.0**	**100.%**	**-**	**-**	**-**
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal Fragments	-	-	-	-	-	-	-	-	-	-	-	-
Insect Parts	-	-	-	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-	-	-	-
Skin Cell % of Total Debris	**40-60%**			**80-100%**			**80-100%**			**N/A**		
Total Debris in Background	**0-20%**			**0-20%**			**60-80%**			**N/A**		

Palmer Hines (6)

Analyst

Approved Signatory

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Client: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Dennis Francoeur

Project: Amesbury 210881 AHS

Lab Order ID: 71982725
Analysis ID: 71982725_STA
Date Received: 01/04/2022
Date Reported: 01/07/2022

Sample ID	125			152.1			317			**EXTERIOR**		
Lab Sample ID	71982725_STA_004			71982725_STA_005			71982725_STA_006			**AVERAGE**		
Description	125			152.1			317			**N/A**		
Lab Notes										**N/A**		
Volume(L)	150			150			150			**N/A**		
Analytical Sensitivity (counts/m³)	39			39			39			**N/A**		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Ascospores							1	39.0	100.%			
Basidiospores												
	No Spores Detected			**No Spores Detected**								
TOTAL	**<1**	**<39.2**	**N/A**	**<1**	**<39.2**	**N/A**	**1**	**39.0**	**100.%**	**-**	**-**	**-**
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal Fragments	-	-	-	-	-	-	-	-	-	-	-	-
Insect Parts	-	-	-	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-	-	-	-
Skin Cell % of Total Debris	**40-60%**			**60-80%**			**60-80%**			**N/A**		
Total Debris in Background	**0-20%**			**60-80%**			**40-60%**			**N/A**		

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Palmer Hines (6)

Analyst

Approved Signatory

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Client: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Dennis Francoeur

Project: Amesbury 210881-AIHS

Lab Order ID: 71982723
Analysis ID: 71982723_STA
Date Received: 01/04/2022
Date Reported: 01/06/2022

Sample ID	1			2			3			**EXTERIOR**		
Lab Sample ID	71982723_STA_001			71982723_STA_002			71982723_STA_003			**AVERAGE**		
Description	Basement Center			1st Floor Center			Outdoor Control			**N/A**		
Lab Notes										**N/A**		
Volume(L)	150			150			150			**N/A**		
Analytical Sensitivity (counts/m³)	39			39			39			**N/A**		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Ascospores	16	627	6.72%	5	196	45.5%	14	549	36.8%	10	373	32.3%
Aspergillus/ Penicillium-like	177	6940	74.4%									
Basidiospores	26	1020	10.9%	4	157	36.4%	23	901	60.5%	21	823	67.7%
Chaetomium	1	39.0	0.420%									
Cladosporium	12	470.	5.04%	2	78.0	18.2%	1	39.0	2.63%	<1	20.0	N/A
Curvularia	2	78.0	0.840%									
Epicoccum	1	39.0	0.420%									
Myxomycete/ Rust/ Smut-like	1	39.0	0.420%									
Pithomyces	2	78.0	0.840%									
Unknown/Other										<1	20.0	N/A
TOTAL	**238**	**9330**	**100.%**	**11**	**431**	**100.%**	**38**	**1490**	**100.%**	**31**	**1240**	**100.%**
Non-Cellulosic Fibers	18	705	-	-	-	-	-	-	-	-	-	-
Hyphal Fragments	19	744	-	-	-	-	-	-	-	-	-	-
Insect Parts	6	235	-	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	1	39.0	-	-	-	-	-	-	-
Skin Cell % of Total Debris		**40-60%**			**40-60%**			**0-20%**			**N/A**	
Total Debris in Background		**80-100%**			**40-60%**			**40-60%**			**N/A**	

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Darrin Parrick (5)

Analyst

Approved Signatory

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Client: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Dennis Francoeur

Project: Amesbury 210881-AIHS

Lab Order ID: 71982723
Analysis ID: 71982723_STA
Date Received: 01/04/2022
Date Reported: 01/06/2022

Sample ID	4			5			**EXTERIOR**		
Lab Sample ID	71982723_STA_004			71982723_STA_005			**AVERAGE**		
Description	Outdoor Control			Blank			**N/A**		
Lab Notes							**N/A**		
Volume(L)	150			0			**N/A**		
Analytical Sensitivity (counts/m³)	39			1			**N/A**		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Ascospores	5	196	20.0%	**No Spores Detected**			10	373	32.3%
Aspergillus/ Penicillium-like									
Basidiospores	19	744	76.0%				21	823	67.7%
Chaetomium									
Cladosporium							<1	20.0	N/A
Curvularia									
Epicoccum									
Myxomycete/ Rust/ Smut-like									
Pithomyces									
Unknown/Other	1	39.0	4.00%				<1	20.0	N/A
TOTAL	**25**	**979**	**100.%**	**<1**	**<1.00**	**N/A**	**31**	**1240**	**100.%**
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-
Hyphal Fragments	-	-	-	-	-	-	-	-	-
Insect Parts	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Skin Cell % of Total Debris	**0-20%**			**0%**			**N/A**		
Total Debris in Background	**20-40%**			**0%**			**N/A**		

Darrin Parrick (5)

Analyst

Approved Signatory

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Client: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Dennis Francoeur

Project: Amesbury 210881 Cashman

Lab Order ID: 71982722
Analysis ID: 71982722_STA
Date Received: 01/04/2022
Date Reported: 01/06/2022

Sample ID	Gym			222			3 Old			**EXTERIOR**		
Lab Sample ID	71982722_STA_001			71982722_STA_002			71982722_STA_003			**AVERAGE**		
Description	Gym			222			3 Old			**N/A**		
Lab Notes										**N/A**		
Volume(L)	150			150			150			**N/A**		
Analytical Sensitivity (counts/m³)	39			39			39			**N/A**		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Ascospores	1	39.0	25.0%	1	39.0	33.3%	2	78.0	50.0%			
Basidiospores	2	78.0	50.0%	1	39.0	33.3%						
Cladosporium	1	39.0	25.0%				2	78.0	50.0%			
Pithomyces				1	39.0	33.3%						
TOTAL	**4**	**156**	**100.%**	**3**	**117**	**100.%**	**4**	**156**	**100.%**	**-**	**-**	**-**
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal Fragments	-	-	-	-	-	-	1	39.0	-	-	-	-
Insect Parts	-	-	-	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-	-	-	-
Skin Cell % of Total Debris	**20-40%**			**40-60%**			**60-80%**			**N/A**		
Total Debris in Background	**0-20%**			**20-40%**			**40-60%**			**N/A**		

Darrin Parrick (5)

Analyst

Approved Signatory

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Client: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Dennis Francoeur

Project: Amesbury 210881 Cashman

Lab Order ID: 71982722
Analysis ID: 71982722_STA
Date Received: 01/04/2022
Date Reported: 01/06/2022

Sample ID	302			408			**EXTERIOR**		
Lab Sample ID	71982722_STA_004			71982722_STA_005			**AVERAGE**		
Description	302			408			**N/A**		
Lab Notes							**N/A**		
Volume(L)	150			150			**N/A**		
Analytical Sensitivity (counts/m³)	39			39			**N/A**		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Ascospores	1	39.0	50.0%	1	39.0	33.3%			
Basidiospores				1	39.0	33.3%			
Cladosporium	1	39.0	50.0%						
Pithomyces				1	39.0	33.3%			
TOTAL	**2**	**78.0**	**100.%**	**3**	**117**	**100.%**	**-**	**-**	**-**
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-
Hyphal Fragments	2	78.0	-	-	-	-	-	-	-
Insect Parts	-	-	-	-	-	-	-	-	-
Pollen	2	78.0	-	-	-	-	-	-	-
Skin Cell % of Total Debris		**60-80%**			**40-60%**			**N/A**	
Total Debris in Background		**40-60%**			**20-40%**			**N/A**	

Darrin Parrick (5)

Analyst

Approved Signatory

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Client: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Dennis Francoeur

Project: Amesbury 210881

Lab Order ID: 71982726
Analysis ID: 71982726_STA
Date Received: 01/04/2022
Date Reported: 01/07/2022

Sample ID	PAC			Gym			Lib			**EXTERIOR**		
Lab Sample ID	71982726_STA_001			71982726_STA_002			71982726_STA_003			**AVERAGE**		
Description	PAC			Gym			Library			**N/A**		
Lab Notes										**N/A**		
Volume(L)	150			150			150			**N/A**		
Analytical Sensitivity (counts/m³)	39			39			39			**N/A**		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Ascospores	**No Spores Detected**			**No Spores Detected**			**No Spores Detected**					
Basidiospores												
TOTAL	**<1**	**<39.2**	**N/A**	**<1**	**<39.2**	**N/A**	**<1**	**<39.2**	**N/A**	-	-	-
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal Fragments	-	-	-	-	-	-	-	-	-	-	-	-
Insect Parts	-	-	-	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-	-	-	-
Skin Cell % of Total Debris	**60-80%**			**20-40%**			**60-80%**			**N/A**		
Total Debris in Background	**0-20%**			**0-20%**			**20-40%**			**N/A**		

Palmer Hines (9)

Analyst

Approved Signatory

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Client: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Dennis Francoeur

Project: Amesbury 210881

Lab Order ID: 71982726
Analysis ID: 71982726_STA
Date Received: 01/04/2022
Date Reported: 01/07/2022

Sample ID	207			302			305			EXTERIOR		
Lab Sample ID	71982726_STA_004			71982726_STA_005			71982726_STA_006			AVERAGE		
Description	207			302			305			N/A		
Lab Notes										N/A		
Volume(L)	150			150			150			N/A		
Analytical Sensitivity (counts/m³)	39			39			39			N/A		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Ascospores							1	39.0	100.%			
Basidiospores												
	No Spores Detected			**No Spores Detected**								
TOTAL	**<1**	**<39.2**	**N/A**	**<1**	**<39.2**	**N/A**	**1**	**39.0**	**100.%**	-	-	-
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal Fragments	-	-	-	-	-	-	-	-	-	-	-	-
Insect Parts	-	-	-	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-	-	-	-
Skin Cell % of Total Debris	**80-100%**			**80-100%**			**80-100%**			**N/A**		
Total Debris in Background	**20-40%**			**0-20%**			**40-60%**			**N/A**		

Disclaimer: This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. Unless otherwise noted blank sample correction was not performed on analytical results. Scientific Analytical Institute participates in the AIHA EMPAT program for fungi. EMPAT Laboratory ID: 173190. Reporting Limit equals Analytical Sensitivity. Unless indicated, areas and volumes were provided by the customer.

Palmer Hines (9)

Analyst

Approved Signatory

Direct Exam: Spore Trap Analysis

SAI Method B-SOP-003

Client: RPF Environmental Inc.
320 1st NH Turnpike
Northwood, NH 03261

Attn: Dennis Francoeur

Project: Amesbury 210881

Lab Order ID: 71982726
Analysis ID: 71982726_STA
Date Received: 01/04/2022
Date Reported: 01/07/2022

Sample ID	402			403			405			**EXTERIOR**		
Lab Sample ID	71982726_STA_007			71982726_STA_008			71982726_STA_009			**AVERAGE**		
Description	402			403			405			**N/A**		
Lab Notes										**N/A**		
Volume(L)	150			150			150			**N/A**		
Analytical Sensitivity (counts/m³)	39			39			39			**N/A**		
IDENTIFICATION	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**	**Raw Count**	**Concentration (counts/m³)**	**% Of Total**
Ascospores				**No Spores Detected**			2	78.0	100.%			
Basidiospores	1	39.0	100.%									
TOTAL	**1**	**39.0**	**100.%**	**<1**	**<39.2**	**N/A**	**2**	**78.0**	**100.%**	**-**	**-**	**-**
Non-Cellulosic Fibers	-	-	-	-	-	-	-	-	-	-	-	-
Hyphal Fragments	1	39.0	-	-	-	-	1	39.0	-	-	-	-
Insect Parts	-	-	-	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-	-	-	-
Skin Cell % of Total Debris	**80-100%**			**0-20%**			**80-100%**			**N/A**		
Total Debris in Background	**20-40%**			**0-20%**			**80-100%**			**N/A**		

Palmer Hines (9)

Analyst

Approved Signatory

APPENDIX B

LIMITATIONS

1. The observations and conclusions presented in the Report were based solely upon the services described herein, and not on scientific tasks or procedures beyond the RPF Environmental, Inc. Scope of Work (SOW) as discussed in the proposal and/or agreement. The conclusions and recommendations are based on visual observations and testing, limited as indicated in the Report, and were arrived at in accordance with generally accepted standards of industrial hygiene practice and asbestos professionals. The nature of this survey or monitoring service was limited as indicated herein and in the report or letter of findings. Further testing, survey, and analysis is required to provide more definitive results and findings.

2. For site survey work, observations were made of the designated accessible areas of the site as indicated in the Report. While it was the intent of RPF to conduct a survey to the degree indicated, it is important to note that not all suspect ACBM material in the designated areas were specifically assessed and visibility was limited, as indicated, due to the presence of furnishings, equipment, solid walls and solid or suspended ceilings throughout the facility and/or other site conditions. Asbestos or hazardous material may have been used and may be present in areas where detection and assessment is difficult until renovation and/or demolition proceeds. Access and observations relating to electrical and mechanical systems within the building were restricted or not feasible to prevent damage to the systems and minimize safety hazards to the survey team.

3. Although assumptions may have been stated regarding the potential presence of inaccessible or concealed asbestos and other hazardous material, full inspection findings for all asbestos and other hazardous material requires the use of full destructive survey methods to identify possible inaccessible suspect material and this level of survey was not included in the SOW for this project. For preliminary survey work, sampling and analysis as applicable was limited and a full survey throughout the site was not performed. Only the specific areas and /or materials indicated in the report were included in the SOW. This inspection did not include a full hazard assessment survey, full testing or bulk material, or testing to determine current dust concentrations of asbestos in and around the building. Inspection results should not be used for compliance with current EPA and State asbestos in renovation/demolition requirements unless specifically stated as intended for this use in the RPF report and considering the limitations as stated therein and within this limitations document.

4. Where access to portions of the surveyed area was unavailable or limited, RPF renders no opinion of the condition and assessment of these areas. The survey results only apply to areas specifically accessed by RPF during the survey. Interiors of mechanical equipment and other building or process equipment may also have asbestos and other hazardous material present and were not included in this inspection. For renovation and demolition work, further inspection by qualified personnel will be required during the course of construction activity to identify suspect material not previously documented at the site or in this survey report. Bordering properties were not investigated and comprehensive file review and research was not performed.

5. For lead in paint, observations were made of the designated accessible areas of the site as indicated in the Report. Limited testing may have been performed to the extent indicated in the text of the report. In order to conduct thorough hazard assessments for lead exposures, representative surface dust testing, air monitoring and other related testing throughout the building, should be completed. This type of in depth testing and analysis was beyond the scope of services for the initial inspection. For lead surveys with XRF readings, it is recommended that surfaces found to have LBP or trace amount of lead detected with readings of less than 4 mg/cm^2 be confirmed using laboratory analysis if more definitive results are required. Substrate corrections involving destructive sampling or damage to existing surfaces (to minimize XRF read-through) were not completed. In some instances, destructive testing may be required for more accurate results. In addition, depending on the specific thickness of the paint films on different areas of a building component, differing amounts of wear, and other factors, XRF readings can vary slightly, even on the same building component. Unless otherwise specifically stated in the scope of services and final report, lead testing performed is not intended to comply with other state and federal regulations pertaining to childhood lead poisoning regulations.

6. Air testing is to be considered a "snap shot" of conditions present on the day of the survey with the understanding that conditions may differ at other times or dates or operational conditions for the facility. Results are also limited based on the specific analytical methods utilized. For phase contrast microscopy (PCM) total airborne fiber testing, more sensitive asbestos-specific analysis using transmission electron microscopy (TEM) can be performed upon request.

7. For asbestos bulk and dust testing, although polarize light microscopy (PLM) is the method currently recognized in State and federal regulations for asbestos identification in bulk samples, some industry studies have found that PLM may not be sensitive enough to detect all of the asbestos fibers in certain nonfriable material, vermiculate type insulation, soils, surface dust, and other materials requiring more sensitive analysis to identify possible asbestos fibers. In the event that more definitive results are requested, RPF recommends that confirmation testing be completed using TEM methods or other analytical methods as may be applicable to the material. Detection of possible asbestos fibers may be made more difficult by the presence of other non-asbestos fibrous components such as cellulose, fiber glass, etc., by binder/matrix materials which may mask or obscure fibrous components, and/or by exposure to conditions capable of altering or transforming asbestos. PLM can show significant bias leading to false negatives and false positives for certain types of materials. PLM is limited by the visibility of the asbestos fibers. In some samples the fibers may be reduced to a diameter so small or masked by coatings to such an extent that they cannot be reliably observed or identified using PLM.

8. For hazardous building material inspection or survey work, RPF followed applicable industry standards; however, RPF does not warrant or certify that all asbestos or other hazardous materials in or on the building has been identified and included in this report. Various assumptions and limitations of the methods can result in missed materials or misidentification of materials due to several factors including but not limited to: inaccessible space due to physical or safety constraints, space that is difficult to reach to fully inspect, assumptions regarding the determination of homogenous groups of suspect material, assumptions regarding attempts to conduct representative sampling, and potential for varying mixtures and layers of material sampled not being representative of all areas of similar material.

9. Full assessments often requires multiple rounds of sampling over a period of time for air, bulk material, surface dust and water. Such comprehensive testing was beyond the scope of RPF services. In addition clearance testing for abatement, as applicable, was based on the visual observations and limited ambient area air testing as indicated in the report and in accordance with applicable state and federal regulations. The potential exists that microscopic surface dust remains with contaminant present even in the event that the clearance testing meets the state and federal requirements. Likewise for building surveys, visual observations are not sufficient alone to detect possible contaminant in settled dust. Unless otherwise specifically indicated in the report, surface dust testing was not included in the scope of the RPF services.

10. For abatement or remediation monitoring services: RPF is not responsible for observations and test for specific periods of work that RPF did not perform full shift monitoring of construction, abatement or remediation activity. In the event that problems occurred or concerns arouse regarding contamination, safety or health hazards during periods RPF was not onsite, RPF is not responsible to provide documentation or assurances regarding conditions, safety, air testing results and other compliance issues. RPF may have provided recommendations to the Client, as needed, pertaining to the Client's Contractor compliance with the technical specifications, schedules, and other project related issues as agreed and based on results of RPF monitoring work. However, actual enforcement, or waiving of, contract provisions and requirements as well as regulatory liabilities shall be the responsibility of Client and Client's Contractor(s). Off-site abatement activities, such as waste transportation and disposal, were not monitored or inspected by RPF.

11. For services limited to clearance testing following abatement or remediation work by other parties: The testing was limited to clearance testing only and as indicated in the report and a site assessment for possible environmental health and safety hazards was not performed as part of the scope of this testing. Client, or Client's abatement contractor as applicable, was responsible for performing visual inspections

of the work area to determine completeness of work prior to air clearance testing by RPF.

12. For site work, including but not limited to air clearance testing services, in which RPF did not provide full site safety and health oversight, abatement design, full shift monitoring of all site activity, RPF expresses no warranties, guarantees or certifications of the abatement work conducted by the Client or other employers at the job site(s), conditions during the work, or regulatory compliance, with the exception of the specific airborne concentrations as indicated by the air clearance test performed by RPF during the conditions present for the clearance testing. Unless otherwise specifically noted in the RPF Report, visual inspections and air clearance testing results apply only to the specific work area and conditions present during the testing. RPF did not perform visual inspections of surfaces not accessible in the work area due to the presence of containment barriers or other obstructions. In these instances, some contamination may be present following RPF clearance testing and such contamination may be exposed during and after removal of the containment barriers or other obstructions following RPF testing services. Client or Client's Contractor is responsible for using appropriate care and inspection to identify potential hazards and to remediate such hazards as necessary to ensure compliance and a safe environment.

13. The survey was limited to the material and/or areas as specifically designated in the report and a site assessment for other possible environmental health and safety hazards or subsurface pollution was not performed as part of the scope of this site inspection. Typically, hazardous building materials such as asbestos, lead paint, PCBs, mercury, refrigerants, hydraulic fluids and other hazardous product and materials may be present in buildings. The survey performed by RPF only addresses the specific items as indicated in the Report.

14. For mold and moisture survey services, RPF services did not include design or remediation of moisture intrusion. Some level of mold will remain at the site regardless of RPF testing and Contractor or Client cleaning efforts. RPF testing associated with mold remediation and assessments is limited and may or may not be representative of other surfaces and locations at the site. Mold growth will occur if moisture intrusion deficiencies have not been fully remedied and if the site or work areas are not maintained in a sufficiently dry state. Porous surfaces in mold contaminated areas which are not removed and disposed of will likely result in future spore release, allergen sources, or mold contamination.

15. Existing reports, drawings, and analytical results provided by the Client to RPF, as applicable, were not verified and, as such, RPF has relied upon the data provided as indicated, and has not conducted an independent evaluation of the reliability of these data.

16. Where sample analyses were conducted by an outside laboratory, RPF has relied upon the data provided, and has not conducted an independent evaluation of the reliability of this data.

17. All hazard communication and notification requirements, as required by U.S. OSHA regulation 29 CFR Part 1926, 29 CFR Part 1910, and other applicable rules and regulations, by and between the Client, general contractors, subcontractors, building occupants, employees and other affected persons were the responsibility of the Client and are not part of the RPF SOW.

18. The applicability of the observations and recommendations presented in this report to other portions of the site was not determined. Many accidents, injuries and exposures and environmental conditions are a result of individual employee/employer actions and behaviors, which will vary from day to day, and with operations being conducted. Changes to the site and work conditions that occur subsequent to the RPF inspection may result in conditions which differ from those present during the survey and presented in the findings of the report.

METHODOLOGY

The results of the air quality testing are representative of the conditions present on the day of the survey and should be considered a snapshot of conditions within the facility. Additional rounds of testing may be required to obtain a statistically valid set of data representative of a variety of conditions which may be present within the facility.

Each of the methods used is discussed separately below.

Microscopic Screen and Fungal Identification-Airborne Fungal Spores and Particulates

Sampling for airborne fungal spores and particulates was completed using a hi-volume air-sampling pump calibrated at a rate of approximately 15 liters of air per minute (lpm) using Zefon Air-O-Cell spore trap cassettes. All samples were collected at approximately three to five feet above the ground for a period of ten minutes per cassette per location. The Air-O-Cell cassette sampling and analysis method provides for the identification and quantification of many, but not all, genus of fungal spores that may be present in the air on the day of the survey and does not determine the viability of fungi spores but rather a total count of spores, both viable and non-viable. At the completion of the sampling, the samples were sealed, labeled, and shipped under chain of custody to Scientific Analytical Institute (SAI) of Greensboro, NC for microscopic analysis. This method will detect many but not all fungal spores present in the air on the day of the survey. SAI is accredited by the AIHA for analysis of microbiological samples. Additional rounds of testing may be required to fully document fungal ecology due to high variability of spore concentrations.

APPENDIX C

Regulatory standards for the testing for and exposure limits for airborne mold, and fungal spores have not been established. The presence of fungi and mold is common in many environments with over 1,000 fairly common species of mold, many we are routinely in contact with are not hazardous under normal conditions.

Ascospore

Ascospores are a general category of spores that have been produced by means of sexual reproduction (in a sack-like structure called an ascus). These are ubiquitous saprobes and plant pathogens, many of which are easily identifiable (i.e. *Chaetomium*). This group contains potential opportunistic pathogens, toxin producers, and allergens depending on the genus and species. A rupture in the top portion of the ascus disperses the spores during rain or in times of high humidity. Some asexual fungi, such as *Aspergillus* and *Penicillium* can become sexual under specific conditions, these are then considered ascomycetes and are given distinct names. The presence of these sports normally is associated with indoor air infiltration.

***Aspergillus/Penicillium* –like**

Aspergillus and *Penicillium* spores are indistinguishable via direct microscopic examination. *Aspergillus* tends to colonize continuously damp materials such as damp wallboard and fabrics. *Penicillium* is commonly found in house dust, on water-damaged wallpaper, behind paint and in decaying fabrics.

Aspergillus sp.

Aspergillus is a common type I & III allergen. They are frequently isolated from forest products, soils, grains, nuts, cotton, organic debris, and water damaged building materials. Spores can also be found in moist ventilation systems and house dust. There are more than 160 different species of *Aspergillus*, sixteen of which have been documented as etiological agents of human disease but rarely occur in individuals with normally functioning immune systems. However, due to the substantial increase in populations of individuals with HIV, chemotherapy patients and those on corticosteroid treatment, contamination of building substrates with fungi, particularly *Aspergillus* is of concern. Aspergillosis is now the second most common fungal infection requiring hospitalization in the United States. Many *Aspergillus* species produce mycotoxins that may be associated with diseases in humans and other animals. Toxin production is dependent on the species or strain within the species and on the food source for the fungus. Some of these toxins are carcinogenic including aflatoxins and ochratoxin. *Aspergillus* is a common cause of extrinsic asthma with symptoms including edema and bronchiospasms, and chronic cases may develop pulmonary emphysema. These fungi are frequently secondary opportunistic pathogens in patients with bronchiectasis, carcinoma, other mycosis, sarcoid, and tuberculosis. Some species can also cause onychomycosis (infection of the nail).

Aureobasidium

Aureobasidium is a saprobe, or weak parasite, type I & III allergen, and common in a variety of soils outdoors. It is widespread in the indoor environment and is common in places that moisture accumulates like bathrooms, kitchens, shower curtains, tile grout, window caulking and windowsills. This genus has 14 species, *A. pullulans* being the most common. Indoors *A. pullulans* is often found as a black stain on damp materials in homes such as painted wood. This species has also been reported to cause chromoblastomycosis (in an immunocompromised patient), which is a chronic cutaneous infection of the skin. Morphology is characterized by producing black, shiny colonies. This fungus produces abundant spores.

Basidiospore

Basidiospores are a general category of sexual spores that have been released from the basidium of a fungus. A ubiquitous type I & III allergen, saprobe and plant pathogen, mainly found in gardens, forests, and woodlands. Spores disseminate during rain or in times of high humidity. Rarely opportunistic pathogens, Basidiospores may produce toxins, including amanitins, monomethyl-hydrazine, muscarine, ibotenic acid, and psilocybin. Basidiospores are an agent of dry wood rot, which may destroy the structure wood of buildings.

Chaetomium

Chaetomium is found worldwide on a variety of substrates including paper, damp sheetrock, carpet, plant compost, soil, and between layers of wet plywood. Several species have been reported to play a major role in decomposition of cellulose-based materials, and is often found indoors with *Stachybotrys*. These fungi are able to dissolve the cellulose fibers in cotton and paper and thus cause the materials to disintegrate. The process is especially rapid under moist conditions. During the Second World War, countries lost a great deal of equipment to these species. *Chaetomium* is reported to have type I & III allergens, and can produce sterigmatocystin, a mycotoxin shown to cause kidney and liver damage in laboratory animals. It is not a common human pathogen, but it has been known to cause skin and nail infections. It is an ascomycete, and in most species the spores are lemon-shaped, with a single germ pore. The spore column results from the breakdown of the asci within the body of the perithecium. The perithecia of *Chaetomium* are superficial and barrel-shaped, and they are clothed with dark, stiff hair.

Cladosporium

Cladosporium is widely distributed in air and rotten organic material. *C. herbarum* is the most frequently found species in outdoor air in temperate climates. It is often found indoors, usually in lesser numbers than outdoors. The dry conidia become easily airborne and are transported over long distances. This fungus is often encountered in dirty refrigerators, especially in reservoirs where condensation is collected. It can easily be seen on moist window frames covering the whole painted area with a velvety olive-green layer. *Cladosporium* often discolors interior paint, paper, or textiles stored under humid conditions. Houses with poor ventilation, houses with thatched straw roofs and houses situated in damp environments may have heavy concentrations of *Cladosporium*, which will be easily expressed when domestic mold is analyzed. It is commonly found on the surface of fiberglass duct liner in the interior of supply ducts. It is also found naturally on dead & woody plants, food, straw, soils, paint, and textiles. The ability to sporulate heavily, ease of dispersal, and buoyant spores makes this fungus the most important fungal airway allergen; and together with *Alternaria*, it commonly causes asthma and hay fever in the Western hemisphere. More than 500 species have been identified. A few species of this genus cause disease, which range from phaeohyphomycosis, a group of mycotic infections characterized by the presence of dematacеous septate hyphae. Infections of the eyes and skin by black fungi (also classified as phaeohyphomycosis), and chromoblastomycosis, chronic localized infection of the skin and subcutaneous tissue that follows the traumatic implantation of the etiologic agent are also caused by this fungus. Chromoblastomycosis lesions are verrucoid, ulcerated, and crusted. Skin abscesses, mycotic keratitis and pulmonary fungus ball have been recorded in immunocompromised patients. It may also cause corneal infections and mycetoma, characterized by localized infections that involve cutaneous and subcutaneous tissue, fascia, and bone consisting of abscesses, granulomata, and draining sinuses, usually in

immunocompromised hosts. *Cladosporium* produces the toxins cladosporin and emodin, but neither of these is very toxic. Fungal colonies are powdery or velvety olive-green to olive-brown.

Curvularia

Curvularia is reported to be a common type I allergen and is pathogenic to soil, plants, and cereals in tropical and subtropical areas. It is an opportunistic leaf spot fungus and weak pathogen, which survives as a saprobe, and is easily isolated from dead turf and weakened and/or dead plant tissue. Some species of *Curvularia* are known as storage molds of grains. This fungus may cause corneal infections, mycetoma and infections in immunocompromised individuals. The species *C. lunata* is the most commonly encountered species and a cause of disease in humans and animals.

Epicoccum

Epicoccum is a dematiaceous mitosporic mould widely distributed and commonly isolated from air, soil and foodstuff. It is found also in some animals and textiles. It is the common causative agent of leaf spots of various plants.

Fruiting Bodies

Fruiting bodies are the portion of the fungus which generates and releases fungal spores into the environment.

Hyphal Fragments

Hyphal fragments are generally viewed as an indicator of fungal growth. Hyphal fragments are the fruiting structures of mold (such as a tree has branches and a plant has stems). Hyphal fragments typically settle quickly, therefore, the presence of high amounts of hyphal fragments on surfaces (above 100/m3) suggests an active fungal growth is nearby.

Myxomycetes

Ubiquitous, type I allergen. Often found on decaying plant material, however occasionally found indoors. Dispersed by wind in the dry phase, while the wet amoebic phase is motile. Myxomycetes exhibit characteristics of protozoans and fungi. Indistinguishable from smuts under 600x microscopy.

Penicillium sp.

Penicillium sp. - A wide number of organisms belong to this genus. Identification to species is difficult. Often found in aerosol samples. Commonly found in soil, food, cellulose, paint, grains, and compost piles. It is commonly found in carpet, wallpaper, and in interior fiberglass duct insulation. Although this fungus is less allergy-provoking than the other molds, Penicillium is reported to be allergenic (skin) and it may cause hypersensitivity pneumonitis and allergic alveolitis in susceptible individuals. It can cause other infections such as keratitis, penicilliosis, and otomycosis. Some species can produce mycotoxins including 1). Ochratoxin which is damaging to the kidneys and liver and is also a suspected carcinogen; there is also evidence that impairs the immune system. 2). Citrinin that can cause renal damage, vasodilatation, and bronchial constriction. 3). Gliotoxin which is an immunosuppressive toxin, and 4). Patulin that is believed to cause hemorrhaging in the brain and lungs and is usually associated with apple and grape spoilage. It can also cause extrinsic asthma. P. camemberti has been responsible for inducing occupational allergies among those who work with soft white cheeses on which the

fungus grows. P. chrysogenum has been found on building materials, including paints, chip boards, and wallpaper.

Pithomyces

Pithomyces is found growing on decaying plants, especially grasses, soil, and wood in tropical areas, it is rare in cold climates. It may grow on paper but is not prolific indoors. This fungus has demonstrated allergenic activity; it is also considered an etiologic agent in immunocompromised patients. The most common saprophytic species, *P. chartarum* produces a mycotoxin called sporidesmin (a piperazinedione) known to be pathogenic in animals causing liver damage and facial eczema, a condition of severe dermatitis in cattle, sheep, and goats. *Pithomyces* can be found on dead vegetative material in pastures, especially ryegrass. It favors warm, wet, humid weather, heavy dews, or irrigation.

Rusts

The order uredinales, or rusts, are among the most important of the Basidiomycetes. There are about 4000-6000 species of rusts, all of which are plant parasites requiring at least one plant or grass as a host to complete its lifecycle. They attack more types of wild and domesticated plants than any other natural fungus. They have a complex lifecycle, having five different spore types including basidiospores, pycniospores, aeciospores, teliospores, and urediospores (the most common one found). It is a type I allergen, and not a known toxin producer. Rusts produce red or rusty to orange spores. They can be found on trees, flowers, grasses, and other living plant materials. Very rarely found growing indoors, unless their host plants are present.

Sterile Hyphae

A mold that is growing only in its filamentous phase without produce conidia or other fruiting bodies. The identification of the moulds depends on seeing conidia, fruiting bodies, and other similar structures and the mould thus cannot be fully identified.

Unclassified Conidia

Unclassified conidia are not classified as any of the recognized spores. They have a definite edge making it look "spore-like". Some commonly seen unidentified conidia are a spore that resembles an octopus with a large body and tentacle-like arms radiating from one side of the spore or a brown to black spore that resembles a four-leaf clover. Generally these spores can be cultured for definitive identification.

Unidentifiable Spores

Unidentifiable spores are not classified as any of the recognized spores. They have a definite edge making it look "spore-like". Some commonly seen unidentifiable spores are spores that resemble an octopus with a large body and tentacle-like arms radiating from one side of the spore or a brown to black spore that resembles a four-leaf clover. Generally these spores can be cultured for definitive identification.

Information Source: Aerotech Laboratories Inc., 1501 W. Knudsen Drive, Phoenix, AZ, 85027; Microbial Fungi Glossary; www.aerotechlabs.com and EMSL Analytical, 107 Haddon Avenue, Westmont, NJ 08108; Fungi Summary; www.emsl.com