LRC Indoor Testing and Research
140 Iowa Lane, Suite 102
Cary, NC 27511
(919) 342-4936

Certificate of Laboratory Analysis

Non-Viable Spore Trap Analysis

Granville County Schools
Bill Graham
101 Delacroix Street
Oxford, NC 27565

Project #: **22-2161**
Project Location: 2173 Brassfield Road
Creedmoor, NC

Project Type: IEQ
PO/Claim #:

Table 1: Non-Viable Air Samples

Date Collected:	11/11/22	11/11/22	11/11/22	11/11/22	11/11/22
Spore Identification	11	12	13	14	15
	Hall @ Room 127	Hall @ Room 124	Hall @ Room 121	Room 124	Outdoor Air
Cladosporium	80	80	93	53	1813
Ascospores	613	1480	1747	1493	11627
Basidiospores[2]	160	240	200	173	373
Smuts, *Periconia* , Myxomycetes[4]	13	53	-	40	160
Penicillium/Aspergillus Group[1]	107	67	80	173	480
Hyphal Elements[3]	27	27	13	13	107
Alternaria	-	-	-	-	-
Curvularia	13	-	-	-	53
Epicoccum	-	-	-	-	-
Cercospora	-	-	-	-	53
Arthrinium	-	-	-	-	-
Clear Brown	-	-	-	-	-
Colorless	-	-	-	-	-
Trichocladium	-	-	-	-	-
Unidentified	-	13	-	-	-
Ulocladium	-	-	-	-	-
Torula	-	-	-	-	-
Pithomyces	-	-	-	13	53
Rust[5]	-	-	-	-	-
Drechslera/Bipolaris	-	-	-	-	53
Tetraploa	-	-	-	-	-
Chaetomium	-	-	-	-	-
Stachybotrys	-	-	-	-	-
	-	-	-	-	-
Total Spores/m^3	**1013**	**1960**	**2133**	**1960**	**14773**
Particulate Level	**low-moderate**	**low**	**low**	**low-moderate**	**low**
Date Analyzed:	**11/11/22**	**11/11/22**	**11/11/22**	**11/11/22**	**11/11/22**

Analyzed by: Cathy A. Richmond, B.S.

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Project #: **22-2161**
Project Location: 2173 Brassfield Road
Creedmoor, NC

Project Type: IEQ
PO/Claim #:

Sample Number: 11
Sample Location: Hall @ Room 127
Date Collected: 11/11/22
Test Requested: Non-viable spore trap analysis
Date Analyzed: 11/11/22

Volume (L): 75
Percentage of Slide Read: 100.0%
Detection Limit: 13.33
Particulate Level: low-moderate
Notes: _

Spore Identification	Count	Results	Units	Percentage
Cladosporium	6	80	spores/m^3	8%
Ascospores	46	613	spores/m^3	61%
Basidiospores	12	160	spores/m^3	16%
Smuts, *Periconia* , Myxomycetes	1	13	spores/m^3	1%
Penicillium/Aspergillus Group	8	107	spores/m^3	11%
Hyphal Elements	2	27	spores/m^3	3%
Alternaria		-	spores/m^3	-
Curvularia	1	13	spores/m^3	1%
Epicoccum		-	spores/m^3	-
Cercospora		-	spores/m^3	-
Arthrinium		-	spores/m^3	-
Clear Brown		-	spores/m^3	-
Colorless		-	spores/m^3	-
Trichocladium		-	spores/m^3	-
Unidentified		-	spores/m^3	-
Ulocladium		-	spores/m^3	-
Torula		-	spores/m^3	-
Pithomyces		-	spores/m^3	-
Rust		-	spores/m^3	-
Drechslera/Bipolaris		-	spores/m^3	-
Tetraploa		-	spores/m^3	-
Chaetomium		-	spores/m^3	-
Stachybotrys		-	spores/m^3	-
		-	spores/m^3	-
Total Spores	**76**	**1013**	**spores/m^3**	

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Project #: **22-2161**
Project Location: 2173 Brassfield Road
Creedmoor, NC

Project Type: IEQ
PO/Claim #:

Sample Number: 12
Sample Location: Hall @ Room 124
Date Collected: 11/11/22
Test Requested: Non-viable spore trap analysis
Date Analyzed: 11/11/22

Volume (L): 75
Percentage of Slide Read: 100.0%
Detection Limit: 13.33
Particulate Level: low
Notes: _

Spore Identification	Count	Results	Units	Percentage
Cladosporium	6	80	spores/m^3	4%
Ascospores	111	1480	spores/m^3	76%
Basidiospores	18	240	spores/m^3	12%
Smuts, *Periconia* , Myxomycetes	4	53	spores/m^3	3%
Penicillium/Aspergillus Group	5	67	spores/m^3	3%
Hyphal Elements	2	27	spores/m^3	1%
Alternaria		-	spores/m^3	-
Curvularia		-	spores/m^3	-
Epicoccum		-	spores/m^3	-
Cercospora		-	spores/m^3	-
Arthrinium		-	spores/m^3	-
Clear Brown		-	spores/m^3	-
Colorless		-	spores/m^3	-
Trichocladium		-	spores/m^3	-
Unidentified	1	13	spores/m^3	1%
Ulocladium		-	spores/m^3	-
Torula		-	spores/m^3	-
Pithomyces		-	spores/m^3	-
Rust		-	spores/m^3	-
Drechslera/Bipolaris		-	spores/m^3	-
Tetraploa		-	spores/m^3	-
Chaetomium		-	spores/m^3	-
Stachybotrys		-	spores/m^3	-
		-	spores/m^3	-
Total Spores	**147**	**1960**	**spores/m^3**	

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Non-Viable Spore Trap Analysis

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Project #: **22-2161**
Project Location: 2173 Brassfield Road
Creedmoor, NC

Project Type: IEQ
PO/Claim #:

Sample Number:	13	**Volume (L):**	75
Sample Location:	Hall @ Room 121	**Percentage of Slide Read:**	100.0%
Date Collected:	11/11/22	**Detection Limit:**	13.33
Test Requested:	Non-viable spore trap analysis	**Particulate Level:**	low
Date Analyzed:	11/11/22	**Notes:**	_

Spore Identification	Count	Results	Units	Percentage
Cladosporium	7	93	spores/m^3	4%
Ascospores	131	1747	spores/m^3	82%
Basidiospores	15	200	spores/m^3	9%
Smuts, *Periconia* , Myxomycetes		-	spores/m^3	-
Penicillium/Aspergillus Group	6	80	spores/m^3	4%
Hyphal Elements	1	13	spores/m^3	1%
Alternaria		-	spores/m^3	-
Curvularia		-	spores/m^3	-
Epicoccum		-	spores/m^3	-
Cercospora		-	spores/m^3	-
Arthrinium		-	spores/m^3	-
Clear Brown		-	spores/m^3	-
Colorless		-	spores/m^3	-
Trichocladium		-	spores/m^3	-
Unidentified		-	spores/m^3	-
Ulocladium		-	spores/m^3	-
Torula		-	spores/m^3	-
Pithomyces		-	spores/m^3	-
Rust		-	spores/m^3	-
Drechslera/Bipolaris		-	spores/m^3	-
Tetraploa		-	spores/m^3	-
Chaetomium		-	spores/m^3	-
Stachybotrys		-	spores/m^3	-
		-	spores/m^3	-
Total Spores	**160**	**2133**	**spores/m^3**	

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Non-Viable Spore Trap Analysis

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Project #: **22-2161**
Project Location: 2173 Brassfield Road
Creedmoor, NC

Project Type: IEQ
PO/Claim #:

Sample Number: 14
Sample Location: Room 124
Date Collected: 11/11/22
Test Requested: Non-viable spore trap analysis
Date Analyzed: 11/11/22

Volume (L): 75
Percentage of Slide Read: 100.0%
Detection Limit: 13.33
Particulate Level: low-moderate
Notes: _

Spore Identification	Count	Results	Units	Percentage
Cladosporium	4	53	spores/m^3	3%
Ascospores	112	1493	spores/m^3	76%
Basidiospores	13	173	spores/m^3	9%
Smuts, *Periconia* , Myxomycetes	3	40	spores/m^3	2%
Penicillium/Aspergillus Group	13	173	spores/m^3	9%
Hyphal Elements	1	13	spores/m^3	1%
Alternaria		-	spores/m^3	-
Curvularia		-	spores/m^3	-
Epicoccum		-	spores/m^3	-
Cercospora		-	spores/m^3	-
Arthrinium		-	spores/m^3	-
Clear Brown		-	spores/m^3	-
Colorless		-	spores/m^3	-
Trichocladium		-	spores/m^3	-
Unidentified		-	spores/m^3	-
Ulocladium		-	spores/m^3	-
Torula		-	spores/m^3	-
Pithomyces	1	13	spores/m^3	1%
Rust		-	spores/m^3	-
Drechslera/Bipolaris		-	spores/m^3	-
Tetraploa		-	spores/m^3	-
Chaetomium		-	spores/m^3	-
Stachybotrys		-	spores/m^3	-
		-	spores/m^3	-
Total Spores	**147**	**1960**	**spores/m^3**	

Analyzed by: Cathy A. Richmond, B.S.

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Project #: **22-2161**
Project Location: 2173 Brassfield Road
Creedmoor, NC

Project Type: IEQ
PO/Claim #:

Sample Number: 15
Sample Location: Outdoor Air
Date Collected: 11/11/22
Test Requested: Non-viable spore trap analysis
Date Analyzed: 11/11/22

Volume (L): 75
Percentage of Slide Read: 25.0%
Detection Limit: 53.33
Particulate Level: low
Notes:

Spore Identification	Count	Results	Units	Percentage
Cladosporium	34	1813	spores/m^3	12%
Ascospores	218	11627	spores/m^3	79%
Basidiospores	7	373	spores/m^3	3%
Smuts, *Periconia* , Myxomycetes	3	160	spores/m^3	1%
Penicillium/Aspergillus Group	9	480	spores/m^3	3%
Hyphal Elements	2	107	spores/m^3	1%
Alternaria		-	spores/m^3	-
Curvularia	1	53	spores/m^3	0%
Epicoccum		-	spores/m^3	-
Cercospora	1	53	spores/m^3	0%
Arthrinium		-	spores/m^3	-
Clear Brown		-	spores/m^3	-
Colorless		-	spores/m^3	-
Trichocladium		-	spores/m^3	-
Unidentified		-	spores/m^3	-
Ulocladium		-	spores/m^3	-
Torula		-	spores/m^3	-
Pithomyces	1	53	spores/m^3	0%
Rust		-	spores/m^3	-
Drechslera/Bipolaris	1	53	spores/m^3	0%
Tetraploa		-	spores/m^3	-
Chaetomium		-	spores/m^3	-
Stachybotrys		-	spores/m^3	-
		-	spores/m^3	-
Total Spores	**277**	**14773**	**spores/m^3**	

Analyzed by: Cathy A. Richmond, B.S.

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Certificate of Laboratory Analysis

Direct Microscopic Examination

Granville County Schools
Bill Graham
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Project #: **22-2161**
Project Location: 2173 Brassfield Road
Creedmoor, NC

Project Type: IEQ
PO/Claim #:

Table 2: Non-Viable Surface Samples

Sample Number:	16		**Date Collected:** 11/11/22
Sample Location:	Chiller Pipe Insulation		
Area:	1 in^2	**Test Requested:**	Direct Microscopic Examination
Results:	**Numerous:**	Cladosporium	
	Occasional:	Penicillium/Aspergillus Group	
	Moderate:	Hyphal Elements	
Analyzed by:	Cathy A. Richmond, B.S.		**Date Analyzed:** 11/11/22
Sample Number:	17		**Date Collected:** 11/11/22
Sample Location:	Window Ledge Room 124		
Area:	1 in^2	**Test Requested:**	Direct Microscopic Examination
Results:	**Occasional:**	Cladosporium	
	Occasional:	Smuts, Periconia, Myxomycetes	
Analyzed by:	Cathy A. Richmond, B.S.		**Date Analyzed:** 11/11/22
Sample Number:	18		**Date Collected:** 11/11/22
Sample Location:	Room 124 Orchid Leafs		
Area:	1 in^2	**Test Requested:**	Direct Microscopic Examination
Results:	**Numerous:**	Penicillium/Aspergillus Group	
	Occasional:	Alternaria	
	Occasional:	Smuts, Periconia, Myxomycetes	
Analyzed by:	Cathy A. Richmond, B.S.		**Date Analyzed:** 11/11/22
Sample Number:	19		**Date Collected:** 11/11/22
Sample Location:	Chiller Pipe Insulation		
Area:	1 in^2	**Test Requested:**	Direct Microscopic Examination
Results:	**Numerous:**	Stachybotrys	
	Numerous:	Hyphal Elements	
Analyzed by:	Cathy A. Richmond, B.S.		**Date Analyzed:** 11/11/22

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Project #: 22-2161

Report Information:

DETECTION LIMITS (DL) for samples are the minimum number of spores or colonies forming units that can be satisfactorily identified for each sample type.

SPORE TRAP SAMPLES: Calculations based on volume of air sampled & percentage of slide counted, i.e. DL = 1000 L / 75 L if 100% of the slide is counted.

CODE 11: Fungal content and/or particulate level on slide too heavy to identify and enumerate fungal content.

Footnotes:

1. *Penicillium/Aspergillus* group spores are characterized by their small size, round to ovoid shape, being unicellular and usually colorless to lightly pigmented. There are numerous genera of fungi whose spore morphology is similar to that of the *Penicillium/Aspergillus* type. Several common examples would be *Acremonium, Paecilomyces,* and *Trichoderma* . Although the majority of spores placed in this group are *Penicillium* , *Aspergillus* , or a combination of both, these are not the only two possibilities.
2. Basidiospores are primarily transported indoors from outdoor sources and rarely grow indoors. A high basidiospore count indoors can be indicative of a wood decay problem or wet soil, and should be verified if and an outdoor source of the spores is not present.
3. Hyphae are the tubular filaments of fungi. Hyphae can fragment and become airborne much like spores and are potentially allergenic.
4. The Smut, *Periconia,* Myxomycete group is a group composed of three different types of organisms whose spores have similar morphologies. Smuts are plant pathogens, *Periconia* is a relatively uncommon mold indoors, and Myxomycetes are not fungi, but slime molds. Although these organisms do not typically proliferate indoors, their spores are potentially allergenic.
5. Rusts are plant pathogens. These fungi do not typically grow indoors unless an infected plant is present. Rust spores are potentially allergenic.

Chain of Custody available on request

Direct Microscopic Exam Reporting:

We use a 400x-600x magnification microscope.

Reporting Quantification Levels are as follows:

Reporting Level	Quantitative Description
Occasional	1-10 per square inch
Few	11-100 per square inch
Moderate	101-1000 per square inch
Numerous	More than 1,000 per square inch

Submitted By Analyst: Cathy A. Richmond, BS