July 20, 2018

Clemson University
310 Klugh Avenue
Clemson, South Carolina 29634

Attn: Mr. W. Robert Newberry, IV
E-mail: wnewber@clemson.edu

Re: Limited Mold and Allergen Investigation Report
Barre Hall - Rooms 105, 109F, and 113
Clemson University
Terracon Project No. 86187072E

Dear Mr. Newberry:

Terracon Consultants, Inc. (Terracon) conducted a limited mold and allergen investigation in three rooms in Barre Hall at the request of Clemson University: Room 105 (breakroom), Room 109F (an office) and Room 113 (a restroom) on the main campus at Clemson University, Clemson, South Carolina. This service was conducted in general accordance with our Master Service Agreement with Clemson University.

PROJECT DESCRIPTION

Scope of Services

At the request of Clemson University, Terracon representative Mr. Benjamin Hestir conducted a limited mold and allergen investigation in the three rooms previously described on Thursday, June 21, 2018.

On our June 21st visit, Terracon made measurements of temperature and relative humidity and conducted airborne mold sampling which consisted of collecting spore trap air samples in three locations inside and the collection of two additional samples outside for comparison. Air samples were collected in pairs, with one spore trap and one viable sample in each location.

In addition, Terracon also collected two surface dust samples, one each from accessible surfaces in Rooms 105 and 109F for allergen analysis. A dust sample was not collected from Room 113 (the bathroom) as the walls and floors were ceramic tile and were very clean, making it difficult to collect a dust sample large enough for the lab to be able to assign a risk factor to the allergen analysis.

Standard of Care

This limited mold and allergen investigation was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. Terracon did not attempt to identify every potential exposure or hazard present in the subject building. The results, findings, conclusions and recommendations expressed in this report are based on conditions observed during our sampling. Many factors, such as weather conditions, building occupancy, ventilation patterns and seasonal variations in fungal concentrations, can affect the conditions observed. The information contained in this report should not be relied upon to represent conditions that existed prior to or after this sampling. Terracon does not warrant the services of regulatory agencies, laboratories or other third parties supplying information that may have been used in the preparation of this report.

SAMPLING CRITERIA AND METHODS

Mold Spore Trap Sampling

Total mold spore trap samples were collected using Allergenco™ spore trap cassettes specifically designed for the collection of airborne mold spores. Air samples were collected using a calibrated Zefon Bio-Pump™ at a flow rate of 15 liters per minute (LPM) for 5 minutes at each location.

After collection, the spore trap samples were hand delivered to Southeast Environmental Microbiology Laboratories, Inc. (SEEML), Greenville, SC. SEEML is accredited by the AIHA® Laboratory Accreditation Programs, LLC under the Environmental Microbiology Laboratory Accreditation Program (EMLAP), Accreditation #173667. Air samples were analyzed by direct microscopic examination and results are reported in spores per cubic meter of air (spores/m^3).

To help interpret the mold sampling results, we compared indoor air and outdoor air measurements. High variability in airborne fungal spore concentrations can exist in different geographic locations, during different seasons, and weather patterns, and over the course of a given day. As a general rule, indoor air fungal spore concentrations in a heating, ventilation and air-conditioning (HVAC)-supplied building are typically less than, but qualitatively similar to, fungal spore concentrations found in the outside environment.

Viable Mold Sampling

Total viable (culturable) fungal samples were collected using malt extract agar (MEA) sampling plates with an Andersen® sampling device and a small vacuum sampling pump at a flow rate of 28.3 liters per minute for three (3) minutes. Viable sampling plates were collected in each of the three rooms of interest (Rooms 105, 109F and 113) and in two outdoor sample locations. The results are reported as total colony forming units per cubic meter of air (cfu/m^3). The laboratory analytical report is as an attachment to this report.

After collection, the viable air samples were delivered by overnight courier under standard chain of custody for analysis by EMSL Laboratories, Inc. (EMSL), who is accredited by the American Industrial Hygiene Association (AIHA®) Laboratory Accreditation Programs, LLC under the Environmental Microbiology Laboratory Accreditation Program (EMLAP) (#100194). The viable plate samples were analyzed by the EMSL branch in Cinnaminson, NJ.

In 2013 the New York Committee for Occupational Safety and Health (NYCOSH) published a document entitled *Methods for Evaluation of Indoor Mold Growth.* This document provides guidance on various mold levels within a conditioned environment. The NYCOSH presents guidance on bioaerosol sampling where mold growth results less than 250 colony forming units per cubic meter of air (CFUs/m^3) may be interpreted as low/normal level growth, results from 250 – 1,000 CFUs/m^3 may be interpreted as moderate mold growth, results >1,000 CFUs/m^3 may be interpreted as active mold growth and results >5,000 CFUs/m^3 may be interpreted as very active growth.

No state or federal exposure limits have been established for fungal aerosols. Regulatory standards, medically based threshold limit or dose-response relationships have not been established for exposure to airborne or surface concentrations of mold spores. Terracon relies upon experience, professional judgment, current scientific literature, guidelines and recommendations made by professional organizations and experts, and statistical methods in interpreting mold sampling results.

Allergen Sampling

Allergen dust samples were collected from carpet, chair fabrics and furniture surfaces in two offices (Rooms 105 and 109F) using a high volume air sampling pump in conjunction with a 3-piece 37 millimeter dust sampling cassette preloaded with a 5.0 micrometer polyvinyl chloride (PVC) filter. After the dust sample collection, the allergen samples were shipped by overnight courier to EMSL in Cinnaminson, New Jersey. EMSL is accredited by the AIHA® Laboratory Accreditation Programs, LLC under the Environmental Microbiology Laboratory Accreditation Program (EMLAP), Accreditation #100194. Allergen samples were analyzed by direct microscopic examination for allergens from dust mites, mouse, rat, cat, dog, and cockroach. Allergen results are reported in either nanograms per filter (ng/filter) or in micrograms of allergens per gram of dust (µg/g).

No state or federal exposure limits have been established for allergens. Laboratory provides guidance on risk levels associated with allergens based on their interpretation of information from the *Journal of Allergy and Clinical Immunology*, the *American Review of Respiratory Disease*, *Environmental Health Perspectives*, *Clinical and Experimental Allergy* and *Pediatric Allergy, Principles and Practice*. See the attached allergen lab report for additional details regarding the risk levels assigned by the lab based on the findings of the analyses.

Temperature and Relative Humidity

Indoor air temperature and relative humidity are physical conditions important to the perception of comfort. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) has published recommendations regarding thermal comfort. ASHRAE Standard 55-2013, Thermal Environmental Conditions for Human Occupancy, identifies six primary factors that affect comfort: metabolic rate (affected by the activity being performed); clothing insulation; air temperature; radiant temperature; air speed; and humidity.

Although the relationships are complex, a temperature range between 73 and 79 degrees Fahrenheit (°F) with relative humidity between roughly 20 and 60 percent (%) are recommended for persons in a conditioned setting wearing light summer clothing. Higher temperatures require lower humidity for comfort. For persons in winter clothing, temperatures can range between 68 and 75°F, with relative humidity between 20% and 60%, with preferred conditions falling between 30% and 50% for both winter and summer temperatures. EPA recommends maintaining indoor humidity below 60%, ideally 30-50%, if possible.

Readings of temperature and relative humidity were collected with an Extech Model 445580 IAQ instrument which was calibrated by the manufacturer.

FINDINGS

General Observations on June 21, 2018

- This work was requested prior to the movement of an existing employee into Room 109F.
- The employee is also expected to make use of the breakroom and the women's restroom.
- The office contained a desk, two chairs and a computer and did not appear to have been cleaned since the previous occupant moved out.

Mold Spore Trap Sampling Findings

On the morning of June 21, 2018, Terracon collected three mold spore trap samples in Barre Hall and two samples in outdoor locations for comparison. In each sample location, measurements of temperature and relative humidity were made. The results of the total spore count samples analyses and the temperature/relative humidity measurements are presented in Table 1 below:

Table 1: Summary of Total Spore Count Analyses, Temperature and Relative Humidity Measurements – June 21, 2018

Sample #	109F-2	109F-5	109F-8	109F-10	109F-12
Location Description	**Rm 109F (office)**	**Rm 105 (breakroom)**	**Room 113 (restroom)**	**Outside SW Entrance**	**Outside SE Entrance**
Spore Type	**Spores/m³**	**Spores/m³**	**Spores/m³**	**Spores/m³**	**Spores/m³**
Ascospores	---	---	---	624	156
Basidiospores	78	156	39	2,180	2,070
Cladosporium	117	13	117	2,730	1,170
Curvalaria	---	----	---	---	13
Epicoccum	---	---	---	26	26
Penicillium/ Aspergillus	156	117	429	2,340	2,690
Smuts/*Periconial* Myxomycetes	---	---	---	13	---
Oidium	---	---	---	13	13
Zygomycetes	---	---	---	---	13
Total	**351**	**286**	**585**	**7,930**	**6,150**
Temperature (degrees Fahrenheit)	70.8	72.8	73.0	84.2	85.6
Relative Humidity (%)	59.3	54.1	50.6	55.5	52.4

There was no visual evidence of water leaks or mold growth in the rooms sampled on June 21, 2018. The lowest outdoor total spore count was approximately 10 times higher than the highest total spore count inside. The dominant mold genera indoors were *Cladosporium* and *Penicillium/Aspergillus* type spores. The dominant mold genera outdoors were *Basidiospores* and *Penicillium/Aspergillus*. The weather on the day we sampled was sunny and warm with light winds. The laboratory analytical report is attached. Sample locations are shown on the attached Figure 1.

Temperature and Relative Humidity – June 21, 2018

The highest indoor temperature was 73ºF and the highest relative humidity was 59.3%. The highest outdoor temperature was 85.6ºF and the highest relative humidity was 55.5%.

Viable Mold Air Sampling – June 21, 2018

On the morning of June 21, 2018, Terracon collected three viable mold air samples in Barre Hall and two samples in outdoor locations for comparison. Sample locations and genus level viable analysis results are summarized in Table 2 below:

Table 2: Summary of Viable Mold Speciation Analyses – June 21, 2018

Sample #	109F-1	109F-4	109F-7	109F-9	109F-11	109F-13
Location Description	**Rm 109F (office)**	**Rm 105 (breakroom)**	**Room 113 (restroom)**	**Outside SE Entrance**	**Outside SW Entrance**	**Field Blank**
Genus and Species	**CFU/m³**	**CFU/m³**	**CFU/m³**	**CFU/m³**	**CFU/m³**	**CFU/m³**
Acremonium sp.	12	---	---	---	---	---
Aspergillus flavus	---	---	---	---	12	---
Aspergillus japonicus	---	---	---	---	12	---
Beauveria bassiana	---	24	24	---	---	---
Cladosporium sp.	---	---	---	816	684	---
Cladosporium cladosporioides	---	36	24	---	---	---
Cladosporium sphaerospermum	228	48	60	---	---	---
Epicoccum sp.	---	---	---	24	---	---
Fusarium sp.	---	---	---	48	36	---
Penicillium sp.	12	---	---	36	48	---
Penicillium citrinum	---	12	48	---	---	---
Pseudopithomyces sp.	12	---	---	---	---	---
Rhodotorula sp.	---	12	12	---	---	---
Sterile (white)	12	---	12	24	24	---
Yeast	132	24	---	---	---	---
Talaromyces pinophilus	---	---	12	---	---	---
Trichoderma sp.	---	---	---	---	12	---
Total	**408**	**156**	**192**	**948**	**828**	**ND**

CFU/M³ – colony forming units per cubic meter of air

There was no visual evidence of water leaks or mold growth in the rooms sampled on June 21, 2018. Indoor viable mold concentrations ranged from 156 CFUs/m³ to 408 CFUs/m³. Outdoor viable mold concentrations were 828 CFUs/m³ and 948 CFUs/m³, respectively. The weather on the day we sampled was sunny and warm with light winds. The laboratory analytical report is attached. Sample locations are shown on the attached Figure 1.

Dust Sampling – June 21, 2018

On the morning of June 21, 2018, Terracon collected two (2) dust samples from the carpeting, chair fabric and furniture in Rooms 109F and Room 105. They were designated as 109F-3 and 109F-6, respectively. The samples were analyzed for allergens from dust mites, mouse, rat, cat, dog, and cockroach.

Allergens were identified in both samples submitted for analysis. Allergens detected in Sample 109F-3 were assigned a “Low” risk level by the lab except for dust mite and cat allergens, which were both assigned a “Moderate” risk level. Allergens detected in Sample 109F-6 were all assigned a “Low” risk level. Table 3 below summarizes the laboratory results. The weather on the day we sampled was sunny and warm with light winds. The laboratory analytical report is attached. Sample locations are shown on the attached Figure 1.

Table 3: Summary of Allergen Analyses – June 21, 2018

Sample #	109F-3	109F-6
Location Description	**Rm 109F (office)**	**Rm 105 (breakroom)**
Allergen Type/Antigen	**Concentrations (ug/g)**	**Concentrations (ug/g)**
Dust Mites / Der fl	2.41	ND
Dust Mites / Der pl	ND	ND
Mouse / Mus ml	ND	ND
Rat / Rat nl	ND	ND
Cat / Fel dl	1.26	0.48
Dog / Can fl	0.05	0.15
Cockroach / Bla G2	ND	ND

ug/g = micrograms per gram; ND – None Detected

CONCLUSIONS

The following conclusions are provided based on our assessment:

- The result of total mold spore (viable and non-viable) sampling indicated indoor levels (286 - 585 spores/m^3) were below outdoor levels (6,150 – 7,930 spores/m^3). The prominent mold spore identified was *Cladosporium sp.* and was observed indoors as well as outdoors.

- The results of viable mold spore air sampling inside Barre Hall are interpreted in conjunction with the NYCOSH document entitled *Methods for Evaluation of Indoor Mold Growth* as being low/normal growth (<250 cfu/m^3) indicated in the breakroom (Room 105) and the women's restroom (room 113). The results in the office (Room 109F) are interpreted as moderate mold growth. Viable mold concentration levels measured in the two outdoor samples are interpreted as moderate mold growth.

- Dust mite (Der fl) and cat allergens in Room 109-F were listed as a moderate risk based on laboratory guidance. Cat and dog allergens identified in the breakroom had a low risk level.

- Temperature levels were slightly below ASHRAE guideline ranges for summer months and relative humidity levels were within EPA guideline ranges. The temperature may be acceptable as long as humidity is maintained below 60%.

- The rooms sampled appeared to be in good condition with no obvious water leaks or mold growth.

RECOMMENDATIONS

The following recommendations are provided based on our assessment:

Although the prominent mold spore identified was *Cladosporium sp.*in the total spore sampling, viable sampling indicated *Cladosporium sp.* was detected indoors that was not detected outdoors. In both sampling methods the total outdoor levels were greater than indoor levels. When sampling by the two methods there may be variation. *Cladosporium sp.* is a common mold that could be found in HVAC systems, Terracon suggests that the HVAC system be assessed for possible areas of growth/excessive moisture or cleaned as a proactive measure.

Dust mite and cat allergens in Room 109F were identified at "moderate" levels defined by the laboratory. It is recommended to clean this room to reduce potential allergen levels. Furthermore the room did not appear to have been cleaned since the previous occupant moved out.

Terracon appreciates the opportunity to provide this service to Clemson University. If you have any questions regarding this limited mold and allergen investigation report, please contact the undersigned at 864-292-2901.

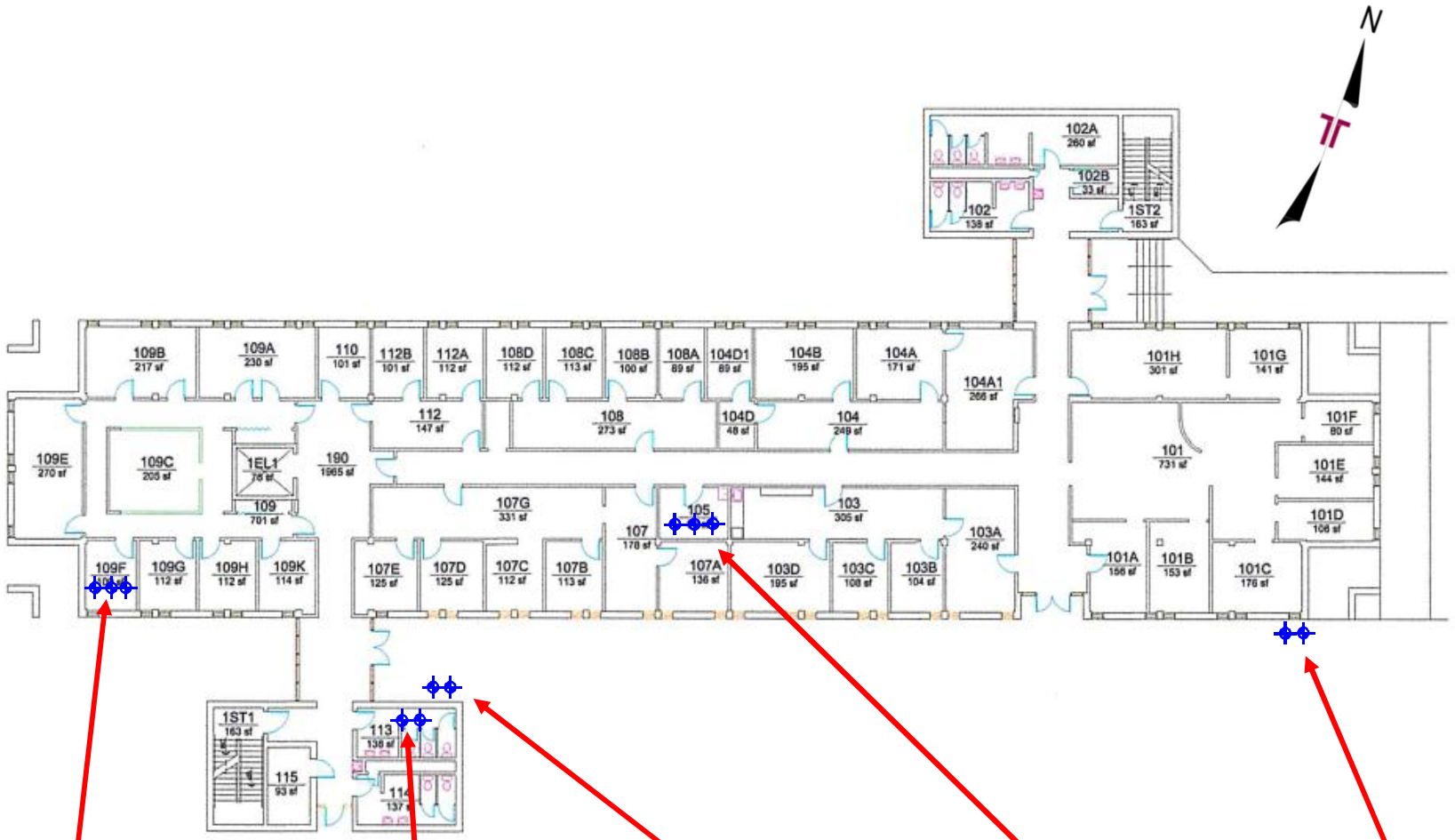
Sincerely,
Terracon Consultants, Inc.

Stephen N. Ellis For
Staff Industrial Hygienist

Jeffrey A. Gurrie
Senior Industrial Hygienist

Attachments: Figure 1 – Sample Location Diagram
Laboratory Results

Figure



Room 109F (office) Samples 109F-1, 109F-2 and 109F-3

Room 113 (restroom) Samples 109F-7 and 109F-8

Outside SW entrance Samples 109F-9 and 109F-10

Room 105 (breakroom) Samples 109F-4, 109F-5 and 109F-6

Outside SE entrance Samples 109F-11 and 109F-12

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: BDH	Project No. 86187072E
Drawn by: BDH	Scale: N.T.S.
Checked by: JAG	File Name:
Approved by: JAG	Date: 6/22/2018

Terracon
Consulting Engineers & Scientists
72 Pointe Circle Greenville, South Carolina 29615
PH. (864) 292-2901 FAX. (864) 292-6301

SAMPLE LOCATION DIAGRAM

Barre Hall
Clemson University Main Campus
Clemson, South Carolina

Figure 1

Laboratory Results

SEEML Reference Number:
180621070

Southeast Environmental Microbiology Laboratories
102 Edinburgh Court
Greenville, SC 29607
Phone: (864) 233-3770
FAX: (864) 233-6589

The information and data for **Terracon** has been checked for thoroughness and accuracy. The following reports are contained within this document:

- ☐ Surface/Bulk Report
- ☒ Spore Trap Report
- ☐ Andersen Fungal Report
- ☐ Quantitative Fungal Report

Lab Manager Review: Rafael Berrios Date: 06/21/18

Thank you for using SEEML laboratories. We strive to provide superior quality and service.
SEEML laboratories are accredited through AIHA-LAP, LLC (EMLAP # 173667) for the analysis of Spore Traps and Surface/Bulk Samples.

The data within this report is reliable to three significant figures. The third significant figure is technically unjustified. In this instance, the third figure is reported as an estimate to facilitate the interpretation by the customer.

Confidentiality Notice:
The document(s) contained herein are confidential and privileged information, intended for the exclusive use of the individual or entity named above. If the reader of this message is not the intended recipient, or the employee or agent responsible for delivering it to the intended recipient, you are hereby notified that any dissemination, distribution or copying of the document(s) is strictly prohibited. If you have received this document in error, please immediately notify us by telephone to arrange for its return. Thank you.

Guidelines for Interpretation:
No accepted quantitative regulatory standards currently exist by which to assess the health risks related to mold and bacterial exposure. Molds and bacteria have been associated with a variety of health effects and sensitivity varies from person to person.
Several organizations, including: the American Conference of Government Industrial Hygienists (ACGIH); the American Industrial Hygiene Association (AIHA); the Indoor Air Quality Association (IAQA); the United States Environmental Protection Agency (USEPA); the Centers for Disease Control (CDC), as well as the California Department of Health Services (CADHS), have all published guidelines for assessment and interpretation of mold resulting from water intrusion in buildings.

Interpretation of the data and information within this document is left to the company, consultant, and/or persons who conducted the fieldwork.

Spore Trap Report

	Date Sampled: 06/21/18
Terracon	Date Received: 06/21/18
72 Pointe Circle	Date Analyzed: 06/21/18
Greenville, SC 29615	Date Reported: 06/21/18
	Date Revised:
	Project Name: Barre Hall RM 109 F
	Project Address: 86187092E
	Project City, State, ZIP:
	SEEML Reference # : 180621070

TEST METHOD: DIRECT MICROSCOPY EXAMINATION AT 400X (100% OF TRACE ANALYZED) SEEML SOP 7

Client Sample ID	109F-2			109F-5			109F-8		
Location	Adjacent to Desk in Rm 109F			Breakroom			Women's Restroom		
Lab Sample ID	180621070-234			180621070-235			180621070-236		
Detection Limit (spores/m^3)	13			13			13		
Hyphal Fragments							1	13	
Pollen	1	13							
Spore Trap Used	Allergenco			Allergenco			Allergenco		
	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%
Alternaria									
Ascospores									
Basidiospores	6	78	22	12	156	55	3	39	7
Bipolaris/Drechslera									
Chaetomium									
Cladosporium	9	117	33	1	13	5	9	117	20
Curvularia									
Epicoccum									
Cercospora									
Fusarium									
Memnoniella									
Nigrospora									
Penicillium/Aspergillus	12	156	44	9	117	41	33	429	73
Polythrincium									
Rusts									
Smuts/Periconia/Myxomy									
Spegazzinia									
Stachybotrys									
Stemphylium									
Tetraploa									
Torula									
Ulocladium									
Colorless/Other Brown 2									
Oidium									
Zygomycetes									
Pithomyces									
Background debris (1-5)3	3			3			3		
Sample Volume(liters)	75			75			75		
TOTAL SPORES/M^3	27	**351**		22	**286**		45	**585**	

Comments: Condition of the sample(s) upon receipt: Acceptable.

1=Total % may not equal 100 due to rounding.

2 = Colorless,other Brown are spores without a distinctive morphology on spore traps and non-viable surface samples.

3 = Background debris is the amount of particulate matter present on the slide and is graded from 1-5 with 1 = very light, 2= Light, 3 = Medium, 4 = Heavy, 5 = Very Heavy. The higher the rating the more likelihood spores may be underestimated. A rating of 5 should be interpreted as minimal counts and may actually be higher than reported.

The reporting limit is 1 Spore/sample.

Disclaimer: This report relates only to the samples tested

Respectfully submitted, SEEML

Rafael Berrios

Rafael Berrios, Approved Laboratory Signatory

102 Edinburgh Court
Greenville, SC 29607
Phone: (864) 233- 3770
Fax: (864) 233-6589
AIHA-LAP, LLC EMLAP # 173667

Spore Trap Report

	Date Sampled: 06/21/18
Terracon	Date Received: 06/21/18
72 Pointe Circle	Date Analyzed: 06/21/18
Greenville, SC 29615	Date Reported: 06/21/18
	Date Revised:
	Project Name: Barre Hall RM 109 F
	Project Address: 86187092E
	Project City, State, ZIP:
	SEEML Reference # : 180621070

TEST METHOD: DIRECT MICROSCOPY EXAMINATION AT 400X (100% OF TRACE ANALYZED) SEEML SOP 7

Client Sample ID	109F-10			109F-12					
Location	Outside- SW			Outside- SE					
Lab Sample ID	180621070-237			180621070-238					
Detection Limit (spores/m^3)	13			13					
Hyphal Fragments	3	39		4	52				
Pollen	2	26							
Spore Trap Used	Allergenco			Allergenco					
	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%			
Alternaria									
Ascospores	48	624	8	12	156	3			
Basidiospores	168	2180	27	159	2070	34			
Bipolaris/Drechslera									
Chaetomium									
Cladosporium	210	2730	34	90	1170	19			
Curvularia				1	13	<1			
Epicoccum	2	26	<1	2	26	<1			
Cercospora									
Fusarium									
Memnoniella									
Nigrospora									
Penicillium/Aspergillus	180	2340	30	207	2690	44			
Polythrincium									
Rusts									
Smuts/Periconia/Myxomy	1	13	<1						
Spegazzinia									
Stachybotrys									
Stemphylium									
Tetraploa									
Torula									
Ulocladium									
Colorless/Other Brown 2									
Oidium	1	13	<1	1	13	<1			
Zygomycetes				1	13	<1			
Pithomyces									
Background debris (1-5)3	3			3					
Sample Volume(liters)	75			75					
TOTAL SPORES/M^3	610	**7930**		473	**6150**				

Comments: Condition of the sample(s) upon receipt: Acceptable.

1=Total % may not equal 100 due to rounding.

2 = Colorless,other Brown are spores without a distinctive morphology on spore traps and non-viable surface samples.

3 = Background debris is the amount of particulate matter present on the slide and is graded from 1-5 with 1 = very light, 2= Light, 3 = Medium, 4 = Heavy, 5 = Very Heavy. The higher the rating the more likelihood spores may be underestimated. A rating of 5 should be interpreted as minimal counts and may actually be higher than reported.

The reporting limit is 1 Spore/sample.

Disclaimer: This report relates only to the samples tested

Respectfully submitted, SEEML

Rafael Berrios

Rafael Berrios, Approved Laboratory Signatory

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AIHA-LAP, LLC EMLAP # 173667

SEEML Labs
Analytical Solutions For a Healthy Indoor Environment

Southeast Environmental Microbiology Laboratories
Chain of Custody

102 Edinburgh Court, Greenville, SC 29607
Phone : 864-233-3770, Fax: 864-233-6589, www.seeml.com, AIHA-LAP, LLC. (EMLAP) #173667

For Lab Use Only			
Condition of samples is acceptable	☑ YES ☐ NO	SEEML Ref #: 180621070	Lab ID: 234-2038 6/21/18

Company Information		Client Information		Environmental Conditions	
(Project Manager)	Ben Hestir	Date Sampled:	6-21-18	Precipitation in last 16hrs:	none
(Company Name)	Terracon	Project Name:	Barre Hall Rm 109F	Relative Humidity I/O:	50 / 55
(Address)	72 Pointe Circle	Project Address:	86187092E	Temperature I/O:	73 / 85
(City, State, Zip)	Greenville, SC 29615	City, State, Zip:		Wind Conditions	light breeze
(Phone)	864-293-7348				
(Email)	ben.hestir@terracon.com				

Sample Type Abbreviations:
A- Allergenco **S**-Swab **AP**-Andersen Plate
AOC- Air O Cell **T**-Tape **W**- Water
M5- Micro 5 **B**- Bulk **D**- Dust

Analysis Type:
1. SporeTrap, Air Sample Analysis-Same Day
2. Direct Exam Surface Sample Analysis -Same Day
3. Culturable Air / Surface Samples -7-10 days

Sample ID	Sample Location	Sample Type	Analysis Type	*Area	**Volume (L)	Notes
109F-2	Adjacent to desk in Rm 109F	A	1		75	
109F-5	Breakroom	A	"		"	
109F-8	Women's Restroom	A	"		"	
109F-10	Outside - SW	A	"		"	
109F-12	Outside - SE	A	"		"	

Reliquished By:	Date/Time	Recieved By:	Date/Time
Ben Hestir	6/21/18 13:58	[illegible]	6/21/18

* Area is only required for culturable surface samples.
** Volume = Pump setting (L/min) x minutes

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-0262
http://www.EMSL.com cinnmicrolab@emsl.com

EMSL Order:	371810507
CustomerID:	GTER78
CustomerPO:	86187072E
ProjectID:	

Attn: **TERRACON**
Terracon Consultants, Inc.
3534 RUTHERFORD ROAD
GREENVILLE, SC 29687

Phone: (864) 292-2901
Fax: (864) 292-6361
Received: 06/22/18 10:00 AM
Analysis Date: 6/28/2018
Collected: 6/21/2018

Project: **Barre Hall Room 109F**

Test Report: Viable Fungi Identification and Enumeration from Impactors (Including Speciation of Penicillium, Aspergillus, Cladosporium and Stachybotrys (EMSL Method MICRO-SOP-202)

Sample Description	Location	Volume (L)	Media	Incubation Temp (C)	Sensitivity (CFU/m³)	Fungal Identification	Colony Count	CFU/m³
109F-1	Room 109F	84.9	MEA	25	12	*Acremonium sp.*	1	12
371810507-0001						*Cladosporium sphaerospermum*	19	228
						Penicillium sp.	1	12
						Pseudopithomyces sp.	1	12
						Sterile(white)	1	12
						Yeast	11	132
						Total	**34**	**408**
109F-4	Breakroom	84.9	MEA	25	12	*Beauveria bassiana*	2	24
371810507-0002						*Cladosporium cladosporioides*	3	36
						Cladosporium sphaerospermum	4	48
						Penicillium citrinum	1	12
						Rhodotorula sp.	1	12
						Yeast	2	24
						Total	**13**	**156**
109F-7	Women's Restroom	84.9	MEA	25	12	*Beauveria bassiana*	2	24
371810507-0003						*Cladosporium cladosporioides*	2	24
						Cladosporium sphaerospermum	5	60
						Penicillium citrinum	4	48
						Rhodotorula sp.	1	12
						Sterile(white)	1	12
						Talaromyces pinophilus	1	12
						Total	**16**	**192**

Analyst(s)

Zeljko Jurjevic (6)

Vincent Iuzzolino

Vincent Iuzzolino, M.S., Laboratory Director
or other approved signatory

Positive hole correction factors have not been applied to the reported data.
The detection limit is equal to 1 colony forming unit (CFU) per agar plate. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation of the data contained in this report is the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Accredited #100194

Initial report from 07/02/2018 14:53:48

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

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

EMSL Order:	371810507
CustomerID:	GTER78
CustomerPO:	86187072E
ProjectID:	

Attn: **TERRACON**
Terracon Consultants, Inc.
3534 RUTHERFORD ROAD
GREENVILLE, SC 29687

Phone:	(864) 292-2901
Fax:	(864) 292-6361
Received:	06/22/18 10:00 AM
Analysis Date:	6/28/2018
Collected:	6/21/2018

Project: **Barre Hall Room 109F**

Test Report: Viable Fungi Identification and Enumeration from Impactors (Including Speciation of Penicillium, Aspergillus, Cladosporium and Stachybotrys (EMSL Method MICRO-SOP-202)

Sample Description	Location	Volume (L)	Media	Incubation Temp (C)	Sensitivity (CFU/m³)	Fungal Identification	Colony Count	CFU/m³
109F-9	Outside SW Entrance	84.9	MEA	25	12	*Cladosporium sp.*	68	816
371810507-0004						*Epicoccum sp.*	2	24
						Fusarium sp.	4	48
						Penicillium sp.	3	36
						Sterile(white)	2	24
						Total	**79**	**948**
109F-11	Outside SE Entrance	84.9	MEA	25	12	*Aspergillus flavus*	1	12
371810507-0005						*Aspergillus japonicus*	1	12
Background						*Cladosporium sp.*	57	684
						Fusarium sp.	3	36
						Penicillium sp.	4	48
						Sterile(white)	2	24
						Trichoderma sp.	1	12
						Total	**69**	**828**
109F-13	Field BLANK		MEA	25		**None Detected**		
371810507-0006								
Blank								

Analyst(s)

Zeljko Jurjevic (6)

Vincent Iuzzolino

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or other approved signatory

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Initial report from 07/02/2018 14:53:48

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EMSL Order #:	**371810507**
Customer ID:	**GTER78**
Customer PO:	**86187072E**

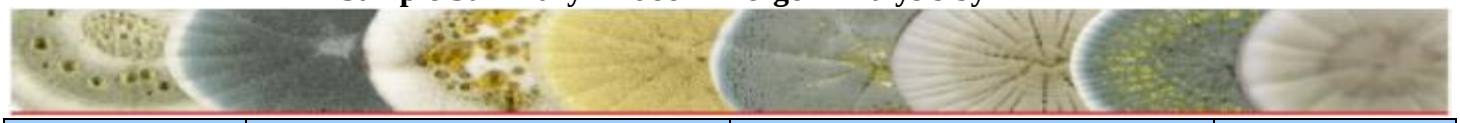
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GREENVILLE, SC 29687

Phone: **864-292-2901**
Fax: **864-292-6361**

Project: **Barre Hall Room 109F**

Date Collected: **6/21/2018**
Date Received: **6/22/2018**
Date Analyzed: **6/25/2018**

Sample Summary -Indoor Allergen Analysis by MARIA®



Lab Sample Number	Client Sample ID	Sample Location	Sample Type
371810507-0007	109F-3	Room 109F	Bulk
371810507-0008	109F-6	Breakroom	Bulk

Report Date	Report Revision	Revision Comments
7/9/2018	R0	Initial Report

Vincent Iuzzolino, M.S., Laboratory Director
or approved EMSL Analytical, Inc. signatory

About Us

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Project: **Barre Hall Room 109F**

Date Collected: **6/21/2018**
Date Received: **6/22/2018**
Date Analyzed: **6/25/2018**

EMSL Sample #: **371810507-0007**
Client ID: **109F-3**
Location: **Room 109F**

Sample Type: **Bulk**
Sample Size: **93**
Sample Units: **mg**

Analytical Results -Indoor Allergen Analysis by MARIA®

Test Parameter	*Antigens*	*Detection Limits*		*Concentrations*		*Allergen Risk Levels*
Dust Mites Allergen	Der f1	0.012	µg/g	**2.41**	µg/g	⚠
Dust Mites Allergen	Der p1	0.012	µg/g	**ND**	µg/g	☑
Mouse Allergen	Mus m1	0.002	µg/g	**ND**	µg/g	☑
Rat Allergen	Rat n1	0.004	µg/g	**ND**	µg/g	†
Cat Allergen	Fel d1	0.004	µg/g	**1.26**	µg/g	⚠
Dog Allergen	Can f1	0.012	µg/g	**0.05**	µg/g	☑
Cockroach Allergen	Bla g2	0.012	µg/g	**ND**	µg/g	☑

†Sufficient evidence is not available for risk levels.

Allergen Risk Levels:

High -Risk of acute asthmatic attack.

Moderate -Risk for sensitization and bronchial hyperactivity.

Low -Not sufficient to cause symptoms or ND (None Detected); Indicates that the amount of allergen in the sample is below the detection limits.

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Report Date	**Report Revision**	**Revision Comments**
7/9/2018	R0	Initial Report

Vincent Iuzzolino, M.S., Laboratory Director
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EMSL Order #: **371810507**
Customer ID: **GTER78**
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Fax: **864-292-6361**

Project: **Barre Hall Room 109F**

Date Collected: **6/21/2018**
Date Received: **6/22/2018**
Date Analyzed: **6/25/2018**

EMSL Sample #: **371810507-0008**
Client ID: **109F-6**
Location: **Breakroom**

Sample Type: **Bulk**
Sample Size: **33**
Sample Units: **mg**

Analytical Results -Indoor Allergen Analysis by MARIA®

Test Parameter	*Antigens*	*Detection Limits*		*Concentrations*		*Allergen Risk Levels*
Dust Mites Allergen	Der f1	0.012	µg/g	**ND**	µg/g	☑
Dust Mites Allergen	Der p1	0.012	µg/g	**ND**	µg/g	☑
Mouse Allergen	Mus m1	0.002	µg/g	**ND**	µg/g	☑
Rat Allergen	Rat n1	0.004	µg/g	**ND**	µg/g	†
Cat Allergen	Fel d1	0.004	µg/g	**0.48**	µg/g	☑
Dog Allergen	Can f1	0.012	µg/g	**0.15**	µg/g	☑
Cockroach Allergen	Bla g2	0.012	µg/g	**ND**	µg/g	☑

†Sufficient evidence is not available for risk levels.

Allergen Risk Levels:

High -Risk of acute asthmatic attack.

Moderate -Risk for sensitization and bronchial hyperactivity.

Low -Not sufficient to cause symptoms or ND (None Detected); Indicates that the amount of allergen in the sample is below the detection limits.

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7/9/2018	R0	Initial Report

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Phone: **864-292-2901**
Fax: **864-292-6361**

Project: **Barre Hall Room 109F**

Date Collected: **6/21/2018**
Date Received: **6/22/2018**
Date Analyzed: **6/25/2018**



Guidelines to Interpretation

	µg/g											
Allergens	<DL	<1	1	2	3	4	5	6	7	8	9	>10
Fel d1	ND	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High	High	High
Can f1	ND	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High
Der p1	ND	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High
Der f1	ND	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High
Mus m1	ND	Low	Mod	Mod	Mod	High	High	High	High	High	High	High

	µg/m3	
Rat n1	ND	<0.7 µg /m3 = Not associated with increased risk of asthma

	µg/g											
	<DL	<0.08	0.08	0.09	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
Bla g2 †	ND	Low	Mod	Mod	Mod	Mod	Mod	Mod	High	High	High	High

† *Suggested levels. Not officially established.*

Note: *This report and guidelines furnish information only. Whether an individual suffers allergic symptoms or not depends on his/her medical history and previous exposure.*

References

Journal of Allergy and Clinical Immunology 1989; 83:416-427
Journal of Allergy and Clinical Immunology 1995; 96:449-456
The American review of respiratory disease 1990; 141:361-367
The American review of respiratory disease 1993; 147:573-578
Environmental Health Perspectives 2002; 110:419-425
Clinical and Experimental Allergy 1998; 28(5):537-44
Pediatric allergy-principles and practice. Mosby Inc 2003: 261-268.

Terminology

ELISA	Enzyme-linked Immunosorbent Assay
MARIA®	Multiplex Array for Indoor Allergens
Allergen	A substance which reacts with the body's immune system to produce an allergic reaction.
Antigen	A substance, foreign to the body, which stimulates the production of antibodies by the immune system.
Bla g2	*Blattella germanica* (Cockroach) allergen 2
Can f1	*Canis familiaris* (Dog) allergen 1
Der f1	*Dermatophagoides farinae* (Dust Mites) allergen 1
Der p1	*Dermatophagoides pteronyssinus* (Dust Mites) allergen 1
Detection Limits	DL is the smallest amount of a substance, in this case antigens, which can be measured.
Fel d1	*Felis domesticus* (Cat) allergen 1
Mus m1	*Mus musculus* (Mouse) allergen 1
ND	None detected, if any allergens are present they are below the detection limits.
Rat n1	*Rattus norvegicus* (Rat) allergen 1

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Customer PO: **86187072E**

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Project: **Barre Hall Room 109F**

Date Collected: **6/21/2018**
Date Received: **6/22/2018**
Date Analyzed: **6/25/2018**



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A. Sample Retention
Samples analyzed by EMSL will be retained for 60 days after analysis date. Storage beyond this period is available for a fee with written request prior to the initial 30 day period. Samples containing hazardous/toxic substances which require special handling will be returned to the client immediately. EMSL reserves the right to charge a sample disposal fee or return samples to the client.

B. Change Orders and Cancellation
All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL is not responsible for holding times that are exceeded due to such changes.

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Report Date	Report Revision	Revision Comments
7/9/2018	R0	Initial Report

Vincent Iuzzolino, M.S., Laboratory Director
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Industrial Hygiene Chain of Custody

EMSL Order Number (Lab Use Only): 371810507

EMSL ANALYTICAL, INC.
200 ROUTE 130 NORTH
CINNAMINSON, NJ 08077
PHONE: (800) 220-3675
FAX: (856) 858-3502

OrderID: 371810507

Report To Contact Name:		**Bill To Company:** Terracon (GTER78)	**Client ID #:**
Company Name: Terracon Consultants, Inc.		**Attention To:**	
Street: 72 Pointe Circle		**Street:**	
City: Greenville	**State/Province:** SC **Zip/Postal Code:** 29615	**City:**	**State/Province:** **Zip/Postal Code:**
Phone : 864-293-7348 **Fax :**		**Phone:**	**Fax:**
Project Name: Barre Hall Room 109F		**Email Results To:** ben.hestir@terracon.com	**U.S. State where Samples Collected:** SC
# Samples in Shipment: 7	**Date of Shipment:** 6/21/18	**Purchase Order:** 86187072E	**Sampled By (Signature):** Ben Hestir

Turnaround Time (TAT) – Please Check: If No Selection Made, Standard 2 Week TAT Will Apply

☑ 2 Week ☐ 1 Week ☐ 4 Day ☐ 3 Day ☐ 2 Day ☐ 1 Day ☐ Other (Call Lab)

Media Type:

Manufacturer/Part #: **Lot #:**

RECEIVED EMSL CINNAMINSON, N.J. 2018 JUN 22 A 10:40

Client Sample ID	Location/Description	Analyte / Method	Media	Flow (lpm)	Sample Time On	Sample Time Off	Volume / Area	Sample Type	Sample Date	Comments
109F-1	Room 109F	M006	MEA	28.3	0852	0855	84.9	☐ Area ☐ Personal	6/21/18	Mold speciation
109F-3	Room 109F	M038, M039, M044	Dust Cas		0908	0913	NA	☐ Area ☐ Personal	6/21/18	Allergens
109F-4	Breakroom	M006	MEA	28.3	0928	0931	84.9	☐ Area ☐ Personal	6/21/18	Mold speciation
109F-6	Breakroom	M038, M039, M044	Dust Cas		0944	0949	NA	☐ Area ☐ Personal	6/21/18	Allergens
109F-7	Womens restroom	M006	MEA	28.3	1006	1009	84.9	☐ Area ☐ Personal	6/21/18	Mold speciation
109F-9	Outside SW entranc	M006	MEA	28.3	1026	1029	84.9	☐ Area ☐ Personal	6/21/18	Mold speciation
109F-11	Outside SE entrance	M006	MEA	28.3	1100	1103	84.9	☐ Area ☐ Personal	6/21/18	Mold speciation
109F-13	Field Blank	M006	MEA					☐ Area ☐ Personal	6/21/18	Field Blank

Note: Most NIOSH and OSHA methods require field blanks. It is the IH field sampler's responsibility to submit the proper number of field blanks and duplicates.

Released By	Date	Received By	Date
Benjamin Hestir	6-21-18	QRM FedEx	6-22-18 10:00
Ben Hestir			

Comments: