December 2, 2016

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
Lever Hall, Room 7C1
Clemson University
Terracon Project No. 86127158 – Task 75

Dear Mr. Newberry:

Terracon Consultants, Inc. (Terracon) conducted a limited mold and allergen investigation in the dormitory room of Cody Krzyzaniak, Lever Hall Room 7C1 on the main campus at Clemson University, Clemson, South Carolina. Reportedly, Mr. Krzyzaniak has experienced a severe case of eczema since moving in to the dorm room, which is believed to be allergy related. 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 Lever Hall, Room 7C1, with visits to the room on Friday, November 11th and again on November 18, 2016.

On our November 11th 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 the dorm and the collection of two additional samples outside for comparison. On November 18th we collected two microvac dust samples, one from each side of the room, for 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 and Allergen Sampling

Total mold spore trap samples were collected using Air-O-Cell™ 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 air sample collection, the 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.

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.

An allergen dust sample was collected from carpet and bedding in the dormitory room of the complainant using a high volume air sampling pump in conjunction with a Zefon 25-millimeter carpet/dust sampling cassette preloaded with a .45 micrometer mixed cellulose ester (MCE) filter.

After 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 micrograms per gram of dust (µg/g).

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

- The dorm room had a strong odor of disinfectant at the time of the initial air samples on November 11th. It is our understanding maintenance cleaned and disinfected the HVAC system hours prior to our site visit.
- The dorm room (Lever 7C1) is reportedly 188 square feet and the building was constructed in 1968.

- The two roommates in 7C1 are Cody Krzyzaniak and Mike Saeger. As you enter the room, the left side is Cody's and the right side is Mike's.
- Mike stated on November 18th that he had similar case of eczema from allergies to Cody's, but that his case was not as severe as his roommates'.
- Photographs from the assessment are attached.

Mold Air Sampling

On the afternoon of November 11, 2016, Terracon collected three mold spore trap samples inside room 7C1 at Lever Hall and two samples in outdoor locations for comparison. The results of the total spore count samples analyses are summarized in Table 1 below:

Table 1: Summary of Total Spore Count Analyses – November 11, 2016

Sample #	Lever ST-1	Lever ST -2	Lever ST -3	Lever ST -4	Lever ST -5
Location Description	**Left bureau (Cody)**	**Right bureau (Mike)**	**Under window**	**Outside entrance**	**Outside parking**
Spore Type	**Spores/m³**	**Spores/m³**	**Spores/m³**	**Spores/m³**	**Spores/m³**
Ascospores	26	39	13	52	65
Basidiospores	741	468	351	1,050	1,600
Bipolaris/Dreschlera	---	---	---	13	---
Cladosporium	1,130	390	1,480	1,650	1,440
Curvularia	---	26	13	---	---
Epicoccum	---	---	---	---	26
Penicillium/ Aspergillus	3,900	4,880	3,470	312	78
Smuts/*Periconia*/ Myxomycetes	13	---	---	26	26
Pithomyces	13	---	13	---	---
Total	**5,820**	**5,800**	**5,340**	**3,100**	**3,240**

There was no visual evidence of water leaks or mold growth in the room. The highest indoor total spore count was approximately 1.9 times higher than the lowest total spore count outside. The dominant molds indoors were *Cladosporium* and *Penicillium/Aspergillus*. The dominant mold types outdoors were *Cladosporium* and Basidiospores. The weather on the day we sampled was warm (69ºF) and cloudy with a light breeze (winds less than 10 mph).

The laboratory analytical report is attached.

Temperature and Relative Humidity

The indoor temperature was 65ºF and the relative humidity was 39%. The outdoor temperature was 68ºF and the relative humidity was 19%.

Dust Sampling

On the afternoon of November 18, 2016, Terracon collected two (2) dust samples from the carpeting and bedding in Room 7C1, Lever Hall, the first from Codys' side (left as you enter) and the second from Mikes' side (right as you enter). They were designated as 7C1 – Allergen 1 and 7C1 – Allergen 2, respectively. The samples were analyzed for allergens from dust mites, mouse, rat, cat, dog, and cockroach.

Allergens were identified in the samples. Allergen risk levels were assigned in the report as being either not detected, low, moderate or high based on the laboratory's suggested risk levels. Table 2 below summarizes the laboratory results. The laboratory analytical report is attached and references additional information.

Table 2: Summary of Allergen Analyses – November 18, 2016

Sample #	7C1 – Allergen1		7C1 – Allergen2	
Location Description	**Left side bedding and carpet (Cody)**		**Right side bedding and carpet (Mike)**	
Allergen Type/Antigen	**Concentrations (ug/g)**	**Allergen Risk Level ¥**	**Concentrations (ug/g)**	**Allergen Risk Level**
Dust Mites / Der fl	**2.47**	**Moderate**	0.72	Low
Dust Mites / Der pl	**27.32**	**High**	0.64	Low
Mouse / Mus ml	ND	Low	ND	Low
Rat / Rat nl	ND	Low	ND	Low
Cat / Fel dl	0.01	Low	0.02	Low
Dog / Can fl	0.09	Low	0.12	Low
Cockroach / Bla G2	ND	Low	ND	Low

¥ Allergen Risk Level guidelines is assigned by the laboratory.

CONCLUSIONS

The following conclusions are provided based on our assessment:

- Total mold spore counts inside were higher than outdoor air.
- *Aspergillus/Penicillium* type spores were identified at a higher concentration in the indoor air as compared to outside.
- Temperature levels were below ASHRAE guideline ranges and relative humidity levels were within EPA guideline ranges.
- The dorm room appeared to be in fair condition with no obvious water leaks or mold growth.

RECOMMENDATIONS

The following recommendations are provided based on our assessment:

- Based on our visual observations at the time of our assessment, no visible mold was identified. Elevated mold spore counts may have occurred due to the cleaning efforts of the HVAC system hours prior to our site visit. The cleaning efforts may have distributed mold spores in the air and did not settle out or were not captured by HEPA vacuums during the cleaning. Please note mold spore sampling cannot distinguish between viable (living) and non-viable mold spores. Cleaning suggested below should capture and removed settled mold spores.

- Due to high and moderate risk dust mite allergen results, the room should be cleaned. Fabric items should be laundered or otherwised cleaned with a disinfecting cleaner and the entire room should be HEPA vacuumed.
  - Bedding items should be laundered in hot water (greater than 50°C).
  - Use of an acaricide may assist in the cleaning process; however, any chemical used should be approved by the university. Cleaning using chemicals should be performed by professionals.
  - HEPA vacuuming will help; however, it may not deep clean some upholstered items.

- After cleaning the room the following should be performed to manage future occurrences:
  - Maintain relative humidity below 50%.
  - Wash bedding at least once a week in hot water.
  - Vacuum at least once a week. Use small pore vacuum bags or HEPA filtered vacuum.

- Additional testing should be performed after cleaning to determine effectiveness.

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

Sincerely,
Terracon Consultants, Inc.

Benjamin Hestir, P.E.
Project Industrial Hygienist

Jeffrey A. Gurrie
Senior Industrial Hygienist

Attachments: Photographs
Laboratory Results

Photographs



Photo #1 Front door



Photo #2 Supply and return air just inside front door



Photo #3 View of right side (Mike) underneath elevated bed



Photo #4 View of left side (Cody) underneath elevated bed



Photo #5 View of right side desk (Mike)

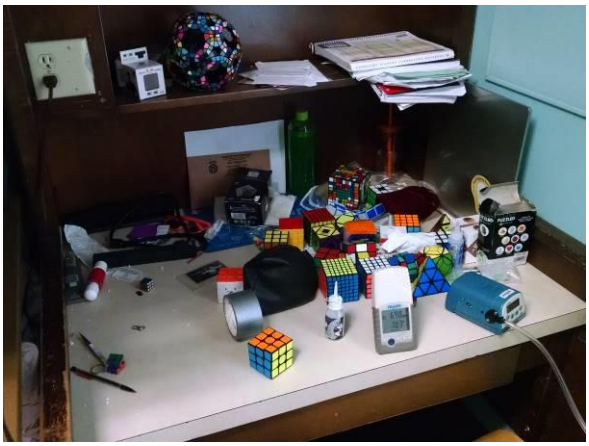


Photo #6 View of left side desk (Cody)



Photo #7 View of left side bedding (Mike) at 2nd sampling event



Photo #8 View of lower window between desks

Laboratory Results

SEEML Reference Number:
161114071

Southeast Environmental Microbiology Laboratories
506 Laurens Rd
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:

- ☐ Direct Exam Report
- ☒ Spore Trap Report
- ☐ Quantitative Fungal Report
- ☐ Andersen Fungal Report
- ☐ Quantitative Direct Exam Report

Lab Manager Review: Rafael Berrios Date: 11/14/16

Thank you for using SEEML laboratories. We strive to provide superior quality and service.
SEEML laboratories are AIHA (American Industrial Hygiene Association) Environmental Microbiology Accredited laboratory for only fungal analysis Air-Direct Examination (EMLAP # 173667).

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:
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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

Attention: Ben Hestir	Date Sampled: 11/11/16
Terracon	Date Received: 11/14/16
72 Pointe Circle	Date Analyzed: 11/14/16
Greenville, SC 29615	Date Reported: 11/14/16
	Date Revised:
	Project Name: Lever 7C1
	Project Address: 86127158 Task 75
	Project City, State, ZIP:
	SEEML Reference # : 161114071

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

Client Sample ID	Lever ST-1			Lever ST-2			Lever ST-3		
Location	Left Bureau			Right Bureau			Under Window		
Lab Sample ID	161114071-208			161114071-209			161114071-210		
Detection Limit (spores/m^3)	13			13			13		
Hyphal Fragments									
Pollen	7	91							
Spore Trap Used	AOC			AOC			AOC		
	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%
Alternaria									
Ascospores	2	26	<1	3	39	<1	1	13	<1
Basidiospores	57	741	13	36	468	8	27	351	7
Bipolaris/Drechslera									
Chaetomium									
Cladosporium	87	1130	19	30	390	7	114	1480	28
Curvularia				2	26	<1	1	13	<1
Epicoccum									
Cercospora									
Fusarium									
Memnoniella									
Nigrospora									
Penicillium/Aspergillus	300	3900	67	375	4880	84	267	3470	65
Polythrincium									
Rusts									
Smuts/Periconia/Myxomy	1	13	<1						
Spegazzinia									
Stachybotrys									
Stemphylium									
Tetraploa									
Torula									
Ulocladium									
Colorless/Other Brown 2									
Oidium									
Zygomycetes									
Pithomyces	1	13	<1				1	13	<1
Background debris (1-5)3	3			3			3		
Sample Volume(liters)	75			75			75		
TOTAL SPORES/M^3	448	**5820**		446	**5800**		411	**5340**	

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

506 Laurens Road
Greenville, SC 29607
Phone: (864) 233- 3770
Fax: (864) 233-6589
AIHA-LAP, LLC EMLAP # 173667

Spore Trap Report

Attention: Ben Hestir	Date Sampled: 11/11/16
Terracon	Date Received: 11/14/16
72 Pointe Circle	Date Analyzed: 11/14/16
Greenville, SC 29615	Date Reported: 11/14/16
	Date Revised:
	Project Name: Lever 7C1
	Project Address: 86127158 Task 75
	Project City, State, ZIP:
	SEEML Reference # : 161114071

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

Client Sample ID	Lever ST-4			Lever ST-5					
Location	Outside Entrance			Outside Parking					
Lab Sample ID	161114071-211			161114071-212					
Detection Limit (spores/m^3)	13			13					
Hyphal Fragments									
Pollen				1	13				
Spore Trap Used	AOC			AOC					
	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%			
Alternaria									
Ascospores	4	52	2	5	65	2			
Basidiospores	81	1050	34	123	1600	49			
Bipolaris/Drechslera	1	13	<1						
Chaetomium									
Cladosporium	127	1650	53	111	1440	44			
Curvularia									
Epicoccum				2	26	<1			
Cercospora									
Fusarium									
Memnoniella									
Nigrospora									
Penicillium/Aspergillus	24	312	10	6	78	2			
Polythrincium									
Rusts									
Smuts/Periconia/Myxomy	2	26	<1	2	26	<1			
Spegazzinia									
Stachybotrys									
Stemphylium									
Tetraploa									
Torula									
Ulocladium									
Colorless/Other Brown 2									
Oidium									
Zygomycetes									
Pithomyces									
Background debris (1-5)3	3			3					
Sample Volume(liters)	75			75					
TOTAL SPORES/M^3	239	**3100**		249	**3240**				

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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Southeast Environmental Microbiology Laboratories

Chain of Custody

506 Laurens Rd, Greenville, SC 29607

Phone : 864-233-3770, Fax: 864-233-3779, www.seeml.com, AIHA-LAP, LLC. (EMLAP) #173667

For Lab Use Only			
Condition of samples is acceptable	☑ YES ☐ NO	SEEML Ref #: 16111407 1	Lab ID: 208- 212

Company Information		Client Information		Environmental Conditions	
(Project Manager)	Bea Hestir	Date Sampled:	11-11-16	Precipitation in last 16hrs:	None
(Company Name)	Terracon	Project Name:	Lever TC1	Relative Humidity I/O:	39% / 19%
(Address)	72 Pointe Circle	Project Address:	8612758 Task 75	Temperature I/O:	66°F / 69°F
(City, State, Zip)	Greenville, SC 29615	City, State, Zip:		Wind Conditions	calm
(Phone)	864-293-7348				
(Email)	bea.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
Lever ST-1	Left bureau	AOC	1		75	
Lever ST-2	Right bureau	"	"		"	
Lever ST-3	Under window	"	"		"	
Lever ST-4	Outside entrance	"	"		"	
Lever ST-5	Outside parking	"	"		"	

Relinquished By:	Date/Time	Recieved By:	Date/Time
Bea Hestir	11-14-16 10:00		11-14-16

* 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 #:	**371623142**
Customer ID:	**GTER78**
Customer PO:	**86127158**

Attn: **Ben Hestir**
Terracon Consultants, Inc.
72 Pointe Circle
Greenville, SC 29615

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

Project: **Lever 7C1 / 86127158 - Task 75**

Date Collected: **11/18/2016**
Date Received: **11/22/2016**
Date Analyzed: **11/22/2016**

Sample Summary -Indoor Allergen Analysis by MARIA®



Lab Sample Number	Client Sample ID	Sample Location	Sample Type
371623142-0001	7C1 - Allergen 1	Left Side - Adam	Bulk
371623142-0002	7C1 - Allergen 2	Right Side - Mike	Bulk

Report Date	Report Revision	Revision Comments
11/30/2016	R0	Initial Report

Farbod Nekouei, M.S., Laboratory Director
or approved EMSL Analytical, Inc. signatory

About us

EMSL Analytical, Inc. offers a full line of analytical solutions for over 30 years across North America. For more information about our nationally accredited locations, vast line of testing services, and our food safety solutions please visit www.EMSL.com or call (800) 220-3675.



Disclaimers

All samples were collected by and all sampling data was provided by the client. The results are valid only for those samples analyzed, and only for those samples collected in accordance with the appropriate methodology as determined by the client. The results herein do not denote or represent a medical or clinical diagnosis or conclusion. In the event that sample(s) were submitted in opened, used, non-sterile or otherwise adulterated condition, EMSL shall not be responsible or liable. EMSL Analytical (Cinnaminson, NJ) is accredited by the American Industrial Hygiene Association (AIHA) in the EMLAP accreditation program for specified Field(s) of Testing as documented on the scope of accreditation.

Please visit our website at http://www.microbiologytestinglab.com/
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EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
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http://www.EMSL.com cinnmicrolab@emsl.com

EMSL Order #: **371623142**
Customer ID: **GTER78**
Customer PO: **86127158**

Attn: **Ben Hestir**
Terracon Consultants, Inc.
72 Pointe Circle
Greenville, SC 29615

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

Project: **Lever 7C1 / 86127158 - Task 75**

Date Collected: **11/18/2016**
Date Received: **11/22/2016**
Date Analyzed: **11/22/2016**

EMSL Sample #: **371623142-0001**
Client ID: **7C1 - Allergen 1**
Location: **Left Side - Cody**

Sample Type: **Bulk**
Sample Size: **51**
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	**2.47**	µg/g	⚠
Dust Mites Allergen	Der p1	0.012	µg/g	**27.32**	µg/g	⛔
Mouse Allergen	Mus m1*	0.04	µg/g	**ND**	µg/g	☑
Rat Allergen	Rat n1*	0.15	µg/g	**ND**	µg/g	†
Cat Allergen	Fel d1	0.004	µg/g	**0.01**	µg/g	☑
Dog Allergen	Can f1	0.012	µg/g	**0.09**	µg/g	☑
Cockroach Allergen	Bla g2	0.012	µg/g	**ND**	µg/g	☑

* Analyzed by ELISA

†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.

All samples were collected by and all sampling data was provided by the client. The results are valid only for those samples analyzed, and only for those samples collected in accordance with the appropriate methodology as determined by the client. The results herein do not denote or represent a medical or clinical diagnosis or conclusion. In the event that sample(s) were submitted in opened, used, non-sterile or otherwise adulterated condition, EMSL shall not be responsible or liable.

EMSL Analytical (Cinnaminson, NJ) is accredited by the American Industrial Hygiene Association (AIHA) in the EMLAP accreditation program for specified Field(s) of Testing as documented on the scope of accreditation.

This report has been prepared by EMSL Analytical, Inc. at the request of and for the exclusive use of the client named in this report. Completely read the important terms, conditions, and limitations that apply to this report

Report Date	**Report Revision**	**Revision Comments**
11/30/2016	R0	Initial Report

Farbod Nekouei, M.S., Laboratory Director
or approved EMSL Analytical, Inc. signatory

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

EMSL Order #: **371623142**
Customer ID: **GTER78**
Customer PO: **86127158**

Attn: **Ben Hestir**
Terracon Consultants, Inc.
72 Pointe Circle
Greenville, SC 29615

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

Project: **Lever 7C1 / 86127158 - Task 75**

Date Collected: **11/18/2016**
Date Received: **11/22/2016**
Date Analyzed: **11/22/2016**

EMSL Sample #: **371623142-0002**
Client ID: **7C1 - Allergen 2**
Location: **Right Side - Mike**

Sample Type: **Bulk**
Sample Size: **30**
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	**0.72**	µg/g	☑
Dust Mites Allergen	Der p1	0.012	µg/g	**0.64**	µg/g	☑
Mouse Allergen	Mus m1*	0.04	µg/g	**ND**	µg/g	☑
Rat Allergen	Rat n1*	0.15	µg/g	**ND**	µg/g	†
Cat Allergen	Fel d1	0.004	µg/g	**0.02**	µg/g	☑
Dog Allergen	Can f1	0.012	µg/g	**0.12**	µg/g	☑
Cockroach Allergen	Bla g2	0.012	µg/g	**ND**	µg/g	☑

* Analyzed by ELISA

†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.

All samples were collected by and all sampling data was provided by the client. The results are valid only for those samples analyzed, and only for those samples collected in accordance with the appropriate methodology as determined by the client. The results herein do not denote or represent a medical or clinical diagnosis or conclusion. In the event that sample(s) were submitted in opened, used, non-sterile or otherwise adulterated condition, EMSL shall not be responsible or liable.

EMSL Analytical (Cinnaminson, NJ) is accredited by the American Industrial Hygiene Association (AIHA) in the EMLAP accreditation program for specified Field(s) of Testing as documented on the scope of accreditation.

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Report Date	**Report Revision**	**Revision Comments**
11/30/2016	R0	Initial Report

Farbod Nekouei, M.S., Laboratory Director
or approved EMSL Analytical, Inc. signatory

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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 #: **371623142**
Customer ID: **GTER78**
Customer PO: **86127158**

Attn: **Ben Hestir**
Terracon Consultants, Inc.
72 Pointe Circle
Greenville, SC 29615

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

Project: **Lever 7C1 / 86127158 - Task 75**

Date Collected: **11/18/2016**
Date Received: **11/22/2016**
Date Analyzed: **11/22/2016**

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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Project: **Lever 7C1 / 86127158 - Task 75**

Date Collected: **11/18/2016**
Date Received: **11/22/2016**
Date Analyzed: **11/22/2016**

Important Terms, Conditions, and Limitations

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.

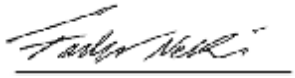
C. Warranty
EMSL warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures and with reasonable care in accordance with applicable federal, state and local laws. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.

D. Limits of Liability
In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to insure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL, the cost of which shall be limited to the reasonable the original sample delivery group (SDG) samples. In no event shall EMSL be liable to a client orvalue of any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder.

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Client shall indemnify EMSL and its officers, directors and employees and hold each of them harmless for any liability, expense or cost, including reasonable attorney's fees, incurred by reason of any third party claim in connection with EMSL's services, the test result data or its use by client.

This report has been prepared by EMSL Analytical, Inc. at the request of and for the exclusive use of the client named in this report. Completely read the important terms, conditions, and limitations that apply to this report.

Report Date	Report Revision	Revision Comments
11/30/2016	R0	Initial Report



Farbod Nekouei, M.S., Laboratory Director
or approved EMSL Analytical, Inc. signatory

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OrderID: 371623142

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*):

371623142

PHONE:
FAX:

Company : Terracon	**EMSL-Bill to:** ☑ Different ☐ Same If Bill to is Different note instructions in Comments**
Street: 72 Pointe Circle	*Third Party Billing requires written authorization from third party*
City: Greenville **State/Province:** SC	**Zip/Postal Code:** 29615 **Country:** USA
Report To (Name): Ben Hestir	**Telephone #:** 864-293-7348
Email Address: ben.hestir@terracon.com	**Fax #:** **Purchase Order:**
Project Name/Number: Lever 7C1 / 86127158 - Task 75	**Please Provide Results:** ☐ FAX ☑ E-mail ☐ Mail
U.S. State Samples Taken: SC	**Connecticut Samples:** ☐ Commercial ☐ Residential

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ■ 1 Week ☐ 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide. TATs are subject to methodology requirements*

Non Culturable Air Samples (Spore Traps) – Test Codes

• **M001** Air-O-Cell • **M049** BioSIS • **M030** Micro 5	• **M173** Allegro M2 • **M003** Burkard • **M174** MoldSnap	• **M004** Allergenco • **M043** Cyclex • **M176** Relle Smart	• **M032** Allergenco-D • **M002** Cyclex-d • **M130** Via-Cell	• **M172** Versa Trap

Other Microbiology Test Codes

• **M041** Fungal Direct Examination • **M005** Viable Fungi ID and Count • **M006** Viable Fungi ID and Count (Speciation) • **M007** Culturable Fungi • **M008** Culturable Fungi (Speciation) • **M009** Gram Stain Culturable Bacteria • **M010** Bacterial Count and ID – 3 Most Prominent • **M011** Bacterial Count and ID – 5 Most Prominent • **M013** Sewage Contamination in Buildings	• **M014** Endotoxin Analysis • **M015** Heterotrophic Plate Count • **M180** Real Time Q-PCR-ERMI 36 Panel • **M018** Total Coliform (Membrane Filtration) • **M020** Fecal *Streptococcus* (Membrane Filtration) • **M210-215** *Legionella* Detection • **M026** Recreational Water Screen • **M027** Mycotoxin Analysis	• **M029** *Enterococci* • **M019** Fecal Coliform • **M133** MRSA Analysis • **M028** *Cryptococcus neoformans* Detection • **M120** *Histoplasma capsulatum* Detection • **M033-39** Allergen Testing • **M044** Group Allergen (Cat, Dog, Cockroach, Dustmites) • **Other** See Analytical Price Guide

Preservation Method (Water):

Name of Sampler: Ben Hestir **Signature of Sampler:** Ben Hestir

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
Example: A1	Kitchen	Air	M001	75L	1/1/12 4:00 PM
7C1 - Allergen1	Left side - Adam	Dust	M044		11/18/16 3:30 PM
7C1 - Allergen 2	Right side - Mike	Dust	M044		11/18/16 3:35 PM

Client Sample # (s): - **Total # of Samples:** 2 (2)

Relinquished (Client): Ben Hestir **Date:** 11/21/16 **Time:** 1200

Received (Client): [illegible] **Date:** 11-22-16 **Time:** 945

Comments:

M044 plus mouse and rat (I don't have the codes for those in my price quote).
M038 M039

Bill to corporate office

RECEIVED
EMSL
MONROE TWP, NJ
16 NOV 22 PM 12:58