DATE: March 27, 2019

TO: Amy Teddy, Principal

SUBJECT: Indian Creek ES - IAQ - Air Test Results - Room 137

On Thursday 2/4, Ensolum LLC Air tested Room 137. It is typically assumed that indoor spore levels in an area with filtered or air-conditioned air, and activity levels associated with schools' average below the outdoor levels. Data from the airborne fungi sampling indicated that the total indoor concentration of mold/fungi in Room 137, was **3.3%** of the outdoor levels. Utilizing this theory, the indoor concentrations are well within the acceptable guidelines for areas with filtered air or air conditioning. If you have any questions, please call me.
Thanks,
Paul

Paul Siddall
Maintenance Energy Auditor (IAQ)
Facility Services
Lewisville ISD
340 Lake Haven Rd
Lewisville, TX 75057

March 10, 2019

Lewisville Independent School District
340 Lake Haven
Lewisville, Texas 75057
Attn: Mr. Paul Siddall

Re:

Limited Mold Assessment
Indian Creek Elementary – Room 137
2050 Arbor Creek Drive
Carrollton, Texas
Ensolum Project No. 01A.1288.007

Ensolum, LLC (Ensolum) was retained to perform limited mold assessment services for within Room 137 of Indian Creek Elementary School located at 2050 Arbor Creek Drive in Carrollton, Texas. Enclosed is the report, including analytical data.

Ensolum appreciates this opportunity to be of service and looks forward to our continued work together. Please contact the undersigned with any questions or concerns you may have.

Sincerely,

Nolan Domain
Mold Assessment Consultant
MAC1479 EXP: 11/9/2019

Darren G. Bowden
Principal
MAC0321 EXP: 2/15/2020

1.0 INTRODUCTION

Ensolum was retained by Mr. Paul Siddall, LISD, to complete a Limited Mold Assessment of classroom 137 within the Indian Creek Elementary School addressed at 2050 Arbor Creek Drive, Carrollton, Texas. The purpose of this investigation was to determine if elevated concentrations of airborne fungal spores and structures were present within the above-referenced office.

Mr. Nolan Domain completed the on-site investigation on February 4, 2019. The Limited Mold Assessment was performed in response to a complaint of possible indoor air quality issues within the classroom.

2.0 PROCEDURE

Ensolum visually inspected accessible areas of the office. No visible water damage or odors were observed in the following locations:

VISIBLE WATER DAMAGE		
LOCATION	DATE	EXPLAINATION
Classroom 137	2-4-2019	N/A

It is possible that water-damaged building materials are present within the adjacent areas but were not reasonably accessible due to access limitations.

Following the inspection of potential water-damaged building materials, Ensolum conducted a moisture investigation in the identified areas to determine if nonvisible water-damaged materials and other building materials within the investigation area were present. The moisture investigation was completed with a GE Protimeter BLD5364 moisture meter on accessible porous and semi-porous building materials in each area of concern. At the time of investigation, monitored building materials did not exhibit elevated moisture concentrations in comparison with similar and non-affected building materials in the structure and standard scientific guidelines.

Representative Relative Humidity readings were collected and recorded using a Vaisala HM40 Humidity and Temperature Meter. Measurements recorded during the investigation are listed in the chart below:

.

TEMPERATURE, RELATIVE HUMIDITY & SPECIFIC HUMIDITY				
LOCATION	DATE	Temperature: F	Relative Humidity	Specific Humidity
Classroom 137	2-4-2019	71.4°	57.3%	48.0

Area air samples were collected with Allergenco-D spore trap cassettes and analyzed for airborne fungal spores and structures. Samples were collected at a rate of 15 liters per minute. Indoor air sample(s) were collected for a five (5) minute period of time (75 liters) at a height of approximately five (5) feet above finished floor (AFF). Outdoor air samples were collected for a five (5) minutes period of time (75 liters) at a height of approximately five (5) feet above level ground. American Conference of Governmental Industrial Hygienists (ACGIH) guidelines were followed for the sample collection. Fungal air samples were collected in the following areas:

SPORE TRAP LOCATIONS	
SAMPLE NUMBER	LOCATION
1	Outdoor
2	Room 137
3	Outdoor

3.0 RESULTS

Currently, there are no regulatory standards for airborne fungal contamination. Therefore, results of the fungal analysis are compared against scientific guidelines. Bioaerosol samples are evaluated by comparing the indoor samples against the outdoor sample. The same types of fungi should be found in both the indoor and outdoor samples. Should higher fungal concentrations occur in the indoor sample(s) or complaint areas, this generally indicates there is a source of fungal growth in the area. The types of fungi are also evaluated-the same types/genus of fungi should be present in both the indoor/complaint and outdoor/non-complaint samples.

The results of the fungal air samples collected were evaluated. Air testing performed using spore traps found that airborne mold spores in the room were considerably lower and were qualitatively similar to those measured outside of the building at the time the sampling was performed.

4.0 CONCLUSIONS

Based on ENSOLUM's limited assessment and the analytical results, it appears that the indoor air quality, as it relates to airborne fungi, was within recommended guidelines on this day.

APPENDIX A

ANALYTICAL DATA

IAQ Mold Report

Summary

2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

TDLR License No.: LAB0117
AIHA EMPAT ID: 102577

Client : Ensolum, LLC
Project : Indian Creek ES, Room 137
Project # : 01A1288007
Sample Type: Spore Trap, Non-cultured
Test Method: Mold: ASTM D7391-17e1 - Standard Profile

Lab Job No. : 19F-01291
Report Date : 02/06/2019 4:02 PM
Sample Date: 02/04/2019
Spore Trap Type: Allergenco D

On 2/5/2019, three (3) samples were submitted by Nolan Domain of Ensolum, LLC (located at 2351 W. Northwest Hwy Suite #1203, Dallas, TX 75220) for Spore Trap, Non-cultured mold analysis. This report consists of three sections; a summary section, a data detail section, and an analytical notes section.

Sample Number	Volume (liters)	Sample Description	Identification	Concentration spores/cubic meter	
1	75	Outside Front	Cladosporium	5455	77%
			Basidiospores	453	6%
			Aspergillus / Penicillium	440	6%
			Ascospores	213	3%
			Myxomycete / Rust / Smut	187	3%
			Peronospora	133	2%
			Cercospora	53	<1%
			Hyphal / Spore Fragments - Dematiaceous	40	<1%
			Coprinus group	40	<1%
			Alternaria	40	<1%
			Drechslera / Bipolaris group	27	<1%
			Agaricales group	13	<1%
			Hyphal / Spore Fragments - Hyaline	13	<1%
			Trichocladium	13	<1%
			Total:	7120	100%
2	75	Room 137	Cladosporium	813	53%
			Aspergillus / Penicillium	160	10%
			Myxomycete / Rust / Smut	133	9%
			Drechslera / Bipolaris group	120	8%
			Alternaria	120	8%
			Basidiospores	53	3%
			Ascospores	53	3%
			Hyphal / Spore Fragments - Dematiaceous	40	3%
			Peronospora	13	<1%
			Helminthosporium	13	<1%
			Curvularia	13	<1%
			Total:	1531	100%

IAQ Mold Report

Summary

2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

TDLR License No.: LAB0117
AIHA EMPAT ID: 102577

Client : Ensolum, LLC
Project : Indian Creek ES, Room 137
Project # : 01A1288007
Sample Type: Spore Trap, Non-cultured
Test Method: Mold: ASTM D7391-17e1 - Standard Profile

Lab Job No. : 19F-01291
Report Date : 02/06/2019 4:02 PM
Sample Date: 02/04/2019
Spore Trap Type: Allergenco D

On 2/5/2019, three (3) samples were submitted by Nolan Domain of Ensolum, LLC (located at 2351 W. Northwest Hwy Suite #1203, Dallas, TX 75220) for Spore Trap, Non-cultured mold analysis. This report consists of three sections; a summary section, a data detail section, and an analytical notes section.

Sample Number	Volume (liters)	Sample Description	Identification	Concentration spores/cubic meter	
3	75	Outside Back * See Analytical Notes report for further details	Cladosporium	40400	86%
			Alternaria	2305	5%
			Drechslera / Bipolaris group	1080	2%
			Aspergillus / Penicillium	653	1%
			Myxomycete / Rust / Smut	560	1%
			Hyphal / Spore Fragments - Dematiaceous	387	<1%
			Basidiospores	360	<1%
			Ascospores	333	<1%
			Ulocladium / Stemphylium	187	<1%
			Chlamydospore	133	<1%
			Epicoccum	133	<1%
			Fusarium	93	<1%
			Cercospora	67	<1%
			Peronospora	67	<1%
			Curvularia	53	<1%
			Hyphal / Spore Fragments - Hyaline	27	<1%
			Pithomyces	27	<1%
			Coprinus group	13	<1%
			Agaricales group	13	<1%
			Total:	46891	100%

Analyst(s): Heather Lopez

Lab Director : Heather Lopez — Approved Signatory : Heather Lopez

Lab Director : Bruce Crabb — Approved Signatory : Bruce Crabb

Thank you for choosing Moody Labs

IAQ Mold Report

Data Detail

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

TDLR License No.: LAB0117
AIHA EMPAT ID: 102577

Client : Ensolum, LLC
Project : Indian Creek ES, Room 137
Project # : 01A1288007
Sample Type: Spore Trap, Non-cultured
Test Method: Mold: ASTM D7391-17e1 - Standard Profile

Lab Job No. : 19F-01291
Report Date : 02/06/2019 4:02 PM
Sample Date: 02/04/2019
Spore Trap Type: Allergenco D

This report consists of three sections; a summary section, a data detail section, and an analytical notes section. Results may not be reported except in full.

Sample ID:	**1**					**2**					**3**				
Location:	Outside Front					Room 137					Outside Back				
Media Expires On:	Dec 2019					Dec 2019					Dec 2019				
Notes Included:											See Analytical Notes				
Volume:	75					75					75				
	raw ct.	RL	spores/m³	%total	spores/m³ SF	raw ct.	RL	spores/m³	%total	spores/m³ SF	raw ct.	RL	spores/m³	%total	spores/m³ SF
Agaricales group	1	13	13	<1%	10						1	13	13	<1%	10
Alternaria	3	13	40	<1%	40	9	13	120	8%	120	121	19	2305	5%	2300
Ascospores	16	13	213	3%	210	4	13	53	3%	50	25	13	333	<1%	330
Aspergillus / Penicillium	33	13	440	6%	440	12	13	160	10%	160	49	13	653	1%	650
Basidiospores	34	13	453	6%	450	4	13	53	3%	50	27	13	360	<1%	360
Cercospora	4	13	53	<1%	50						5	13	67	<1%	70
Chaetomium															
Chlamydospore											10	13	133	<1%	130
Cladosporium	150	36	5455	77%	5500	61	13	813	53%	810	101	400	40400	86%	40000
Coprinus group	3	13	40	<1%	40						1	13	13	<1%	10
Curvularia						1	13	13	<1%	10	4	13	53	<1%	50
Drechslera / Bipolaris group	2	13	27	<1%	30	9	13	120	8%	120	81	13	1080	2%	1100
Epicoccum											10	13	133	<1%	130
Fusarium											7	13	93	<1%	90
Helminthosporium						1	13	13	<1%	10					
Hyphal / Spore Fragments - Dematiace	3	13	40	<1%	40	3	13	40	3%	40	29	13	387	<1%	390
Hyphal / Spore Fragments - Hyaline	1	13	13	<1%	10						2	13	27	<1%	30
Memnoniella															
Myxomycete / Rust / Smut	14	13	187	3%	190	10	13	133	9%	130	42	13	560	1%	560
Peronospora	10	13	133	2%	130	1	13	13	<1%	10	5	13	67	<1%	70
Pithomyces											2	13	27	<1%	30
Stachybotrys															
Trichocladium	1	13	13	<1%	10										
Ulocladium / Stemphylium											14	13	187	<1%	190
TOTALS	275		7120	100%	7100	115		1531	100%	1500	536		46891	100%	47000
Analyst	Heather Lopez					Heather Lopez					Heather Lopez				
Analysis Date	2/6/2019					2/6/2019					2/6/2019				
Debris Rating	4					4					4				
Debris Composition															
Fibers	1/5					3/5					1/5				
Inorganic/Other	4/5					2/5					5/5				
Insect Parts	1/5					1/5					1/5				
Pollen	2/5					1/5					2/5				
Skin/Dander	3/5					5/5					3/5				

IAQ Mold Report

Data Detail

2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

TDLR License No.: LAB0117
AIHA EMPAT ID: 102577

Client : Ensolum, LLC
Project : Indian Creek ES, Room 137
Project # : 01A1288007
Sample Type: Spore Trap, Non-cultured
Test Method: Mold: ASTM D7391-17e1 - Standard Profile

Lab Job No. : 19F-01291
Report Date : 02/06/2019 4:02 PM
Sample Date: 02/04/2019
Spore Trap Type: Allergenco D

This report consists of three sections; a summary section, a data detail section, and an analytical notes section. Results may not be reported except in full.

End of Data Detail section
19F-01291

IAQ Mold Report

Analytical Notes

2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

TDLR License No.: LAB0117
AIHA EMPAT ID: 102577

Client : Ensolum, LLC
Project : Indian Creek ES, Room 137
Project # : 01A1288007
Sample Type: Spore Trap, Non-cultured
Test Method: Mold: ASTM D7391-17e1 - Standard Profile

Lab Job No. : 19F-01291
Report Date : 02/06/2019 4:02 PM
Sample Date : 02/04/2019
Spore Trap Type: Allergenco D

This report consists of three sections; a summary section, a data detail section, and an analytical notes section. Results may not be reported except in full.

Samples Analyzed

Sample No	3 : Outside Back
Notes:	Please note: the minimum detection limit for Cladosporium is 400 spores / cubic meter. When comparing results to other samples, use calculated results, not raw numbers. Please note: the minimum detection limit for Alternaria is 19 spores / cubic meter. When comparing results to other samples, use calculated results, not raw numbers.

Field Blanks

No discernable field blanks were submitted with this set of samples.

NOTE: All remaining samples suitable for analysis.

Methods

Method: ASTM D7391-17e1: Categorization and Quantification of Airborne Fungal Structures in an Inertial Impaction Sample by Optical Microscopy.
Samples are read at 100% unless noted. Partial readings may be employed when concentrations are elevated. Use final spore concentrations, not raw spore counts, for interpretation of results.

Calculation: Spores/cubic meter = (Raw spore count)*(RL)
Note: RL (Reporting Limit) is based upon 1 raw spore count.
Moody Labs recommends two significant figures for calculated values based on ASTM D7391-17e1.

This report must not be used by the customer to claim product certification, approval, or endorsement by AIHA, ISO, or any agency of the Federal Government.

Debris Rating Key

0 - No linear trace detected
1 - Trace particulate/debris
2 - Light particulate/debris
3 - Moderate particulate/debris.
4 - Substantial particulate/debris
5 - Extensive particulate/debris
6 - Field blank
10 - Hold Sample
11 - Modified Analysis per Client Instructions

NOTE: Particulate/debris are defined as skin, fibers, pollen grains, insect parts, fungal and/or other non-fungal particles.

IAQ Mold Report

Analytical Notes

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460
TDLR License No.: LAB0117
AIHA EMPAT ID: 102577

Client : Ensolum, LLC
Project : Indian Creek ES, Room 137
Project # : 01A1288007
Sample Type: Spore Trap, Non-cultured
Test Method: Mold: ASTM D7391-17e1 - Standard Profile

Lab Job No. : 19F-01291
Report Date : 02/06/2019 4:02 PM
Sample Date : 02/04/2019
Spore Trap Type: Allergenco D

This report consists of three sections; a summary section, a data detail section, and an analytical notes section. Results may not be reported except in full.

End of Analytical Notes section
19F-01291

IAQ Mold Report

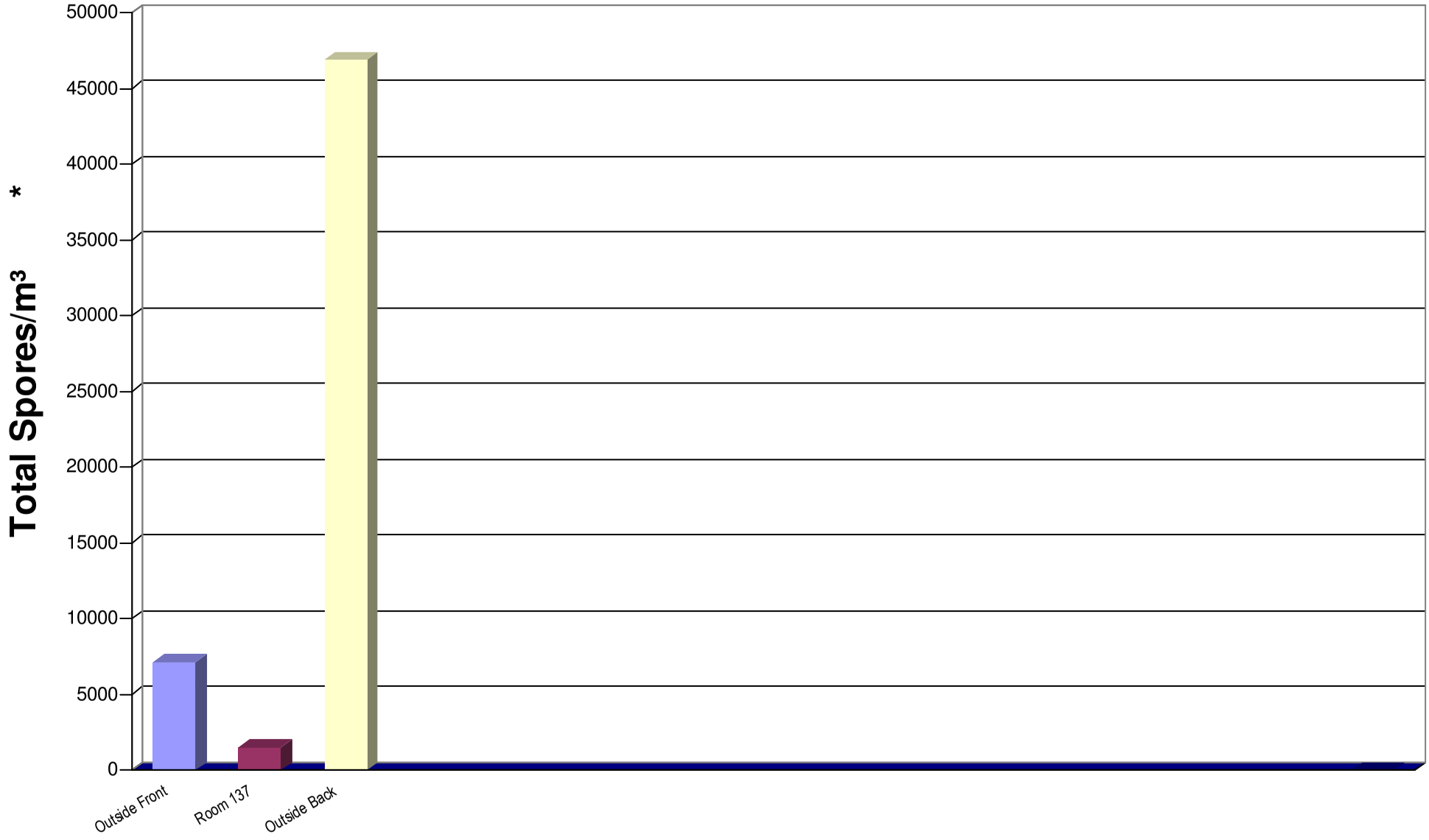
Supplemental Overview

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

TDLR License No.: LAB0117
AIHA EMPAT ID: 102577

Client : Ensolum, LLC
Project : Indian Creek ES, Room 137
Project # : 01A1288007

Lab Job No. 19F-01291
Report Date 02/06/2019 4:02 PM
Sample Date : 02/04/2019



Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

IAQ Mold Report

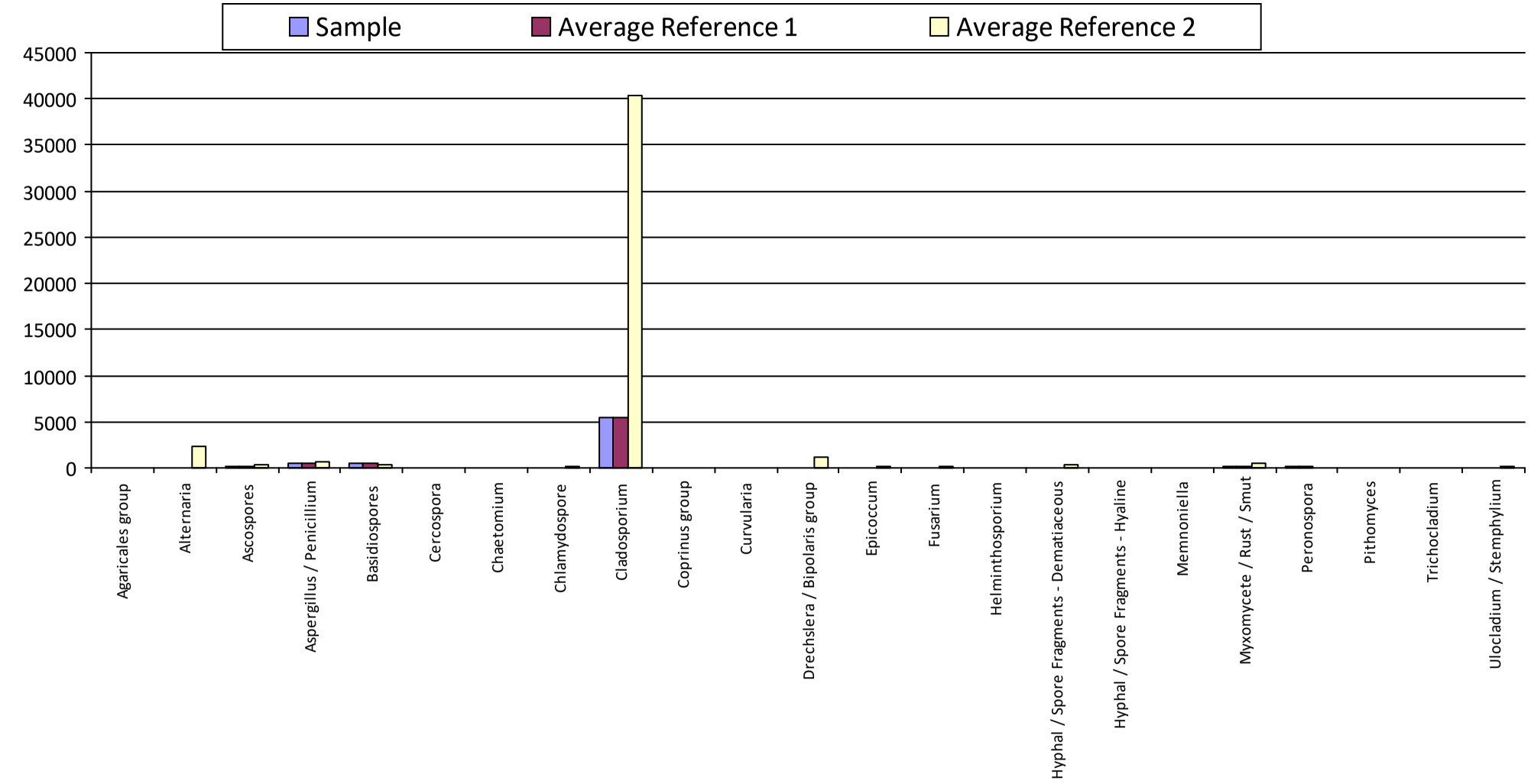
Supplemental Overview

TDLR License No.: LAB0117
AIHA EMPAT ID: 102577

Client : Ensolum, LLC
Project : Indian Creek ES, Room 137
Project # : 01A1288007

Outside Front

Lab Job No. 19F-01291
Report Date 02/06/2019 4:02 PM
Sample Date : 02/04/2019



Average Reference 1 = Outside Front

Average Reference 2 = Outside Back

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

IAQ Mold Report

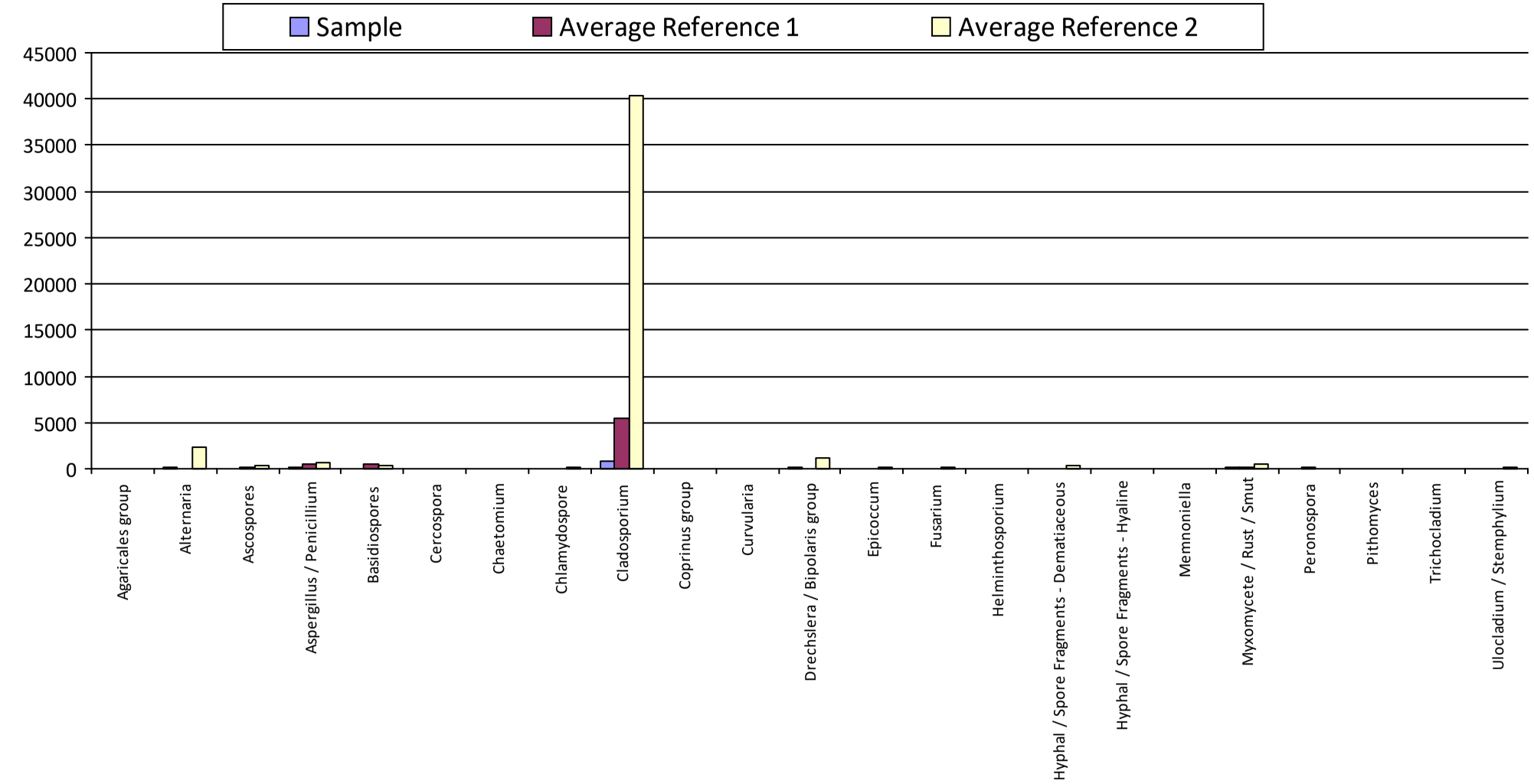
Supplemental Overview

TDLR License No.: LAB0117
AIHA EMPAT ID: 102577

Client : Ensolum, LLC
Project : Indian Creek ES, Room 137
Project # : 01A1288007

Room 137

Lab Job No. 19F-01291
Report Date 02/06/2019 4:02 PM
Sample Date : 02/04/2019



Average Reference 1 = Outside Front

Average Reference 2 = Outside Back

Moody Labs
2051 Valley View Lane
Farmers Branch, TX 75234 Phone: (972) 241-8460

IAQ Mold Report

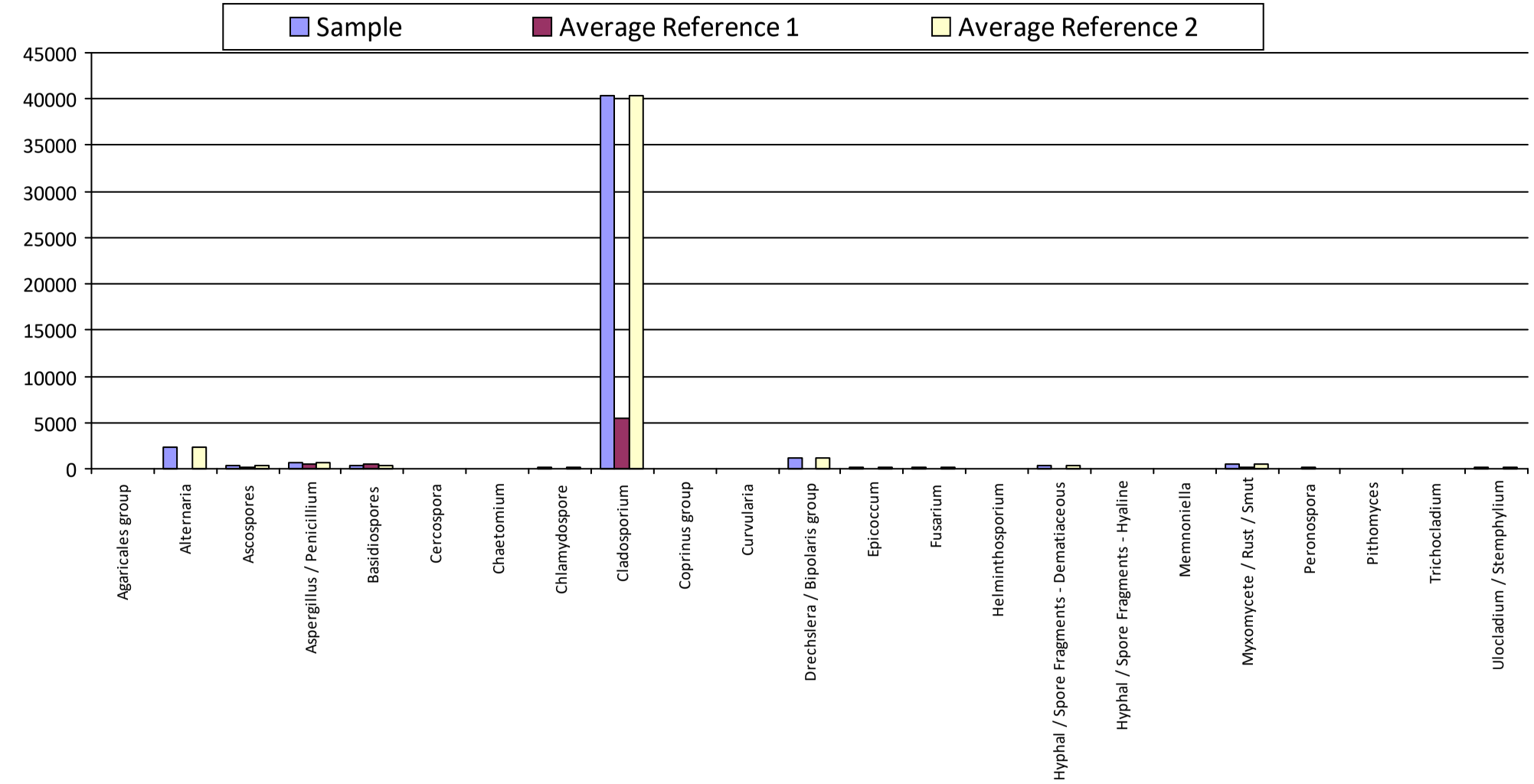
Supplemental Overview

TDLR License No.: LAB0117
AIHA EMPAT ID: 102577

Client : Ensolum, LLC
Project : Indian Creek ES, Room 137
Project # : 01A1288007

Outside Back

Lab Job No. 19F-01291
Report Date 02/06/2019 4:02 PM
Sample Date : 02/04/2019



Average Reference 1 = Outside Front

Average Reference 2 = Outside Back

End of Supplemental Overview section
19F-01291

APPENDIX B

DEFINITIONS AND LIMITATIONS

ENSOLUM

Mold Services Definitions & Limitations

Ensolum performed services in accordance with generally accepted practices of the profession undertaken in similar services at the same time and in the same geographical area. No other warranties, express or implied, apply to the services hereunder or the final report.

Ensolum's services and any report have been prepared on behalf of and for the exclusive use of the Client solely for its use and reliance in assessing the presence of mold in the Investigation Areas of the site. The Client was the only party to which Ensolum explained the risks and limitations of the services and was solely involved in shaping the scope of services. Accordingly, reliance on this report by any other party may involve assumptions leading to an unintended interpretation of findings and opinions. With the consent of the Client, Ensolum may offer reliance to third parties or contract with other parties to develop findings and opinions related to such party's unique risk management concerns. Notwithstanding the foregoing, reliance by any and all third parties upon this deliverable, Ensolum's services or any subsequent report shall be limited in the aggregate to the fair market value of the services provided by Ensolum.

"Limited Mold Assessment". This deliverable uses the term "Limited Mold Assessment" to denote that Ensolum's mold assessment services are limited: (i) to certain portions of the building structure (e.g., the Investigation Areas), by non-destructive sampling methodologies, and/or by access limitations to building materials or components within the Investigation Area(s). In contrast to a "Limited Assessment" is a comprehensive assessment would involve destructive sampling methods with the assessment to be conducted throughout the entire building structure.

Time sensitive. One must keep in mind that mold assessments are essentially a "snap shot in time," and the results are only relevant at the time of site reconnaissance. Because mold, when biologically active, is a living organism, its presence is influenced and controlled by environmental conditions. Mold assessments, therefore, are "time sensitive" in that the presence and concentration of mold and similar organisms in building structures or in the air is directly influenced by environmental conditions (such as humidity, moisture, nutrients and substrates), whether natural or caused by man, which conditions may vary significantly over relatively short periods of time.

Methodologies. Currently, mold assessment methodologies and protocols in Texas are governed by persuasive guidelines (rather than promulgated federal/state or local regulations). Presently, there is no data that supports a threshold limit or dose-response relationship for exposure to mold aeroallergens, individual pathogens, opportunistic pathogens and/or mycotoxins. The Occupational Safety and Health Administration (OSHA), the National Institute of Occupational Safety and Health (NIOSH) and other non-governmental associations, have not yet established permissible exposure limits (PELs), recommended exposure limits (RELs), or other limit values for fungi. Because no limit values presently exist. Ensolum will not and cannot represent that the site contains no harmful microbes, mold, fungi, or their metabolites, or other latent conditions beyond those identified by the limited scope of this mold assessment.

Findings limited. Findings in an LMA are limited due to the nature of the information obtained such as a visual reconnaissance of readily accessible areas of building structures, interview information, anecdotal information, and limited sampling data derived from one or more specific sampling events. Ensolum cannot warrant the accuracy of prior or subsequent information/data, reports and services performed by other firms at the Site. Ensolum assumes no responsibility or liability for errors in information or data provided by or through the client or third party sources. Ensolum's services are not to be construed as legal or medical interpretation or advice.

Moisture Intrusion Limitation. Ensolum performs mold assessment services and is not a moisture intrusion, HVAC, plumbing or building envelope specialist. However, during the course of conducting its mold assessment services, Ensolum will report observed areas of apparent moisture intrusion. Ensolum does not and will not investigate the cause or causes of such observed moisture intrusion. In the event apparent moisture intrusion is observed, Ensolum will recommend that the client contact a specialist (i.e., plumbing contractor, building envelope specialist, HVAC contractor, water intrusion specialist, etc.) to assist the client in determining the specific cause or causes of the moisture intrusion and remedial options.

Certificate of Mold Damage Remediation (CMDR). For mold remediation projects (above certain size thresholds), applicable Texas law (i.e., Texas Occupation Code Section 1958.54 and T.A.C. Section 295.397 (the Texas Mold Assessment and Remediation Rules), requires that a "Certificate of Mold Damage Remediation" be issued by the Mold Remediation Contractor upon successful completion of the project. This certificate must be provided to property owners no later than the 10th day after the date on which the mold remediation is completed at a property. The Mold Remediation Certificate issued by the Mold Remediation Contractor must include a certification by the Mold Assessor that the mold remediation project has been successfully completed in accordance with the mold remediation protocol.

Be advised that Ensolum's issuance of a CMDR upon successful completion of a Mold Remediation project does not mean, warrant or otherwise guarantee that mold will not be subsequently found in any portion of an Investigation Area or the Site. In the event that Ensolum is engaged to render services in connection with a mold remediation project, ENSOLUM will require Client to provide to Ensolum written documentation that all sources of moisture which contributed to the presence of mold in the Investigation Area have been fully remediated and corrected prior to achieving clearance.