

DATE: March 27, 2019

TO: Jim Baker, Principal

SUBJECT: DeLay MS - IAQ - Air Test Results - Room 271

On Thursday /14, Ensolum LLC Air tested Room 271. 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 271, was **8.7%** of the outdoor levels. Utilizing this theory, the indoor concentrations are 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



February 24, 2019

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

Re:

Limited Mold Assessment
Delay Middle School – Room 271
2103 Savage Ln.
Lewisville, Texas
Ensolum Project No. 01A.1288.009

Ensolum, LLC (Ensolum) was retained to perform limited mold assessment services within Room 271 of Delay Middle School located at 2103 Savage Lane in Lewisville, 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 Room 271 within Delay Middle School addressed at 2103 Savage Lane, Lewisville, 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 14, 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	EXPLANATION
Room 271	2-14-2019	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
Room 271	2-14-2019	69.0°	47.3%	49.0
Outdoor	2-14-2019	77.3°	26.7%	34.0

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 271
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

TDLR License No.: LAB0117

AIHA EMPAT ID: 102577

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

Client : Ensolum, LLC

Lab Job No. : 19F-01785

Project : Delay MS, Room 271

Report Date : 02/19/2019 2:08 PM

Project # : 01A1288009

Sample Date: 02/14/2019

Sample Type: Spore Trap, Non-cultured

Spore Trap Type: Allergenco D

Test Method: Mold: ASTM D7391-17e1 - Standard Profile

Page 1 of 2

On 2/15/2019, 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 Entry * See Analytical Notes report for further details	Cladosporium	2400 49%
			Aspergillus / Penicillium	733 15%
			Basidiospores	600 12%
			Hyphal / Spore Fragments - Dematiaceous	400 8%
			Myxomycete / Rust / Smut	307 6%
			Ascospores	133 3%
			Alternaria	93 2%
			Agaricales group	40 <1%
			Non-specified Fungal Spore(s)	40 <1%
			Coprinus group	40 <1%
			Drechslera / Bipolaris group	27 <1%
			Cercospora	13 <1%
			Helicomyces	13 <1%
			Oidium	13 <1%
			Arthrinium	13 <1%
			Curvularia	13 <1%
			Total:	4878 100%
2	75	Room 271	Cladosporium	133 31%
			Basidiospores	93 22%
			Aspergillus / Penicillium	80 19%
			Curvularia	53 12%
			Hyphal / Spore Fragments - Dematiaceous	40 9%
			Myxomycete / Rust / Smut	13 3%
			Ascospores	13 3%



IAQ Mold Report

Summary

TDLR License No.: LAB0117

AIHA EMPAT ID: 102577

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

Client : Ensolum, LLC**Project :** Delay MS, Room 271**Project # :** 01A1288009**Sample Type:** Spore Trap, Non-cultured**Test Method:** Mold: ASTM D7391-17e1 - Standard Profile**Lab Job No. :** 19F-01785**Report Date :** 02/19/2019 2:08 PM**Sample Date:** 02/14/2019**Spore Trap Type:** Allergenco D

Page 2 of 2

On 2/15/2019, 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 Basidiospores Aspergillus / Penicillium Hyphal / Spore Fragments - Dematiaceous Myxomycete / Rust / Smut Ascospores Agaricales group Non-specified Fungal Spore(s) Oscillatoria Coprinus group Drechslera / Bipolaris group Curvularia <div style="text-align: right;">Total:</div>	2305 48% 773 16% 666 14% 413 9% 347 7% 160 3% 53 1% 40 <1% 13 <1% 13 <1% 13 <1% 13 <1% 4809 100%

Results may not be reported except in full. Data contained in this test report relates only to the samples tested. This report does not express or imply interpretation of the results contained herein. Interpretation should be made by a qualified professional.

Moody Labs assumes no responsibility for the manner in which these samples were collected or handled prior to being received at this laboratory. Moody Labs assumes no responsibility for the qualifications of personnel performing sampling and/or interpretations of this data.

Analyst(s): M. Garcia

Lab Director : Heather Lopez

Lab Director : Bruce Crabb

Approved Signatory : _____

Approved Signatory : _____

Thank you for choosing Moody Labs

SMLMS v12.97



IAQ Mold Report

Data Detail

TDLR License No.: LAB0117

AIHA EMPAT ID: 102577

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

Client : Ensolum, LLC	Lab Job No. : 19F-01785
Project : Delay MS, Room 271	Report Date : 02/19/2019 2:08 PM
Project # : 01A1288009	Sample Date: 02/14/2019
Sample Type: Spore Trap, Non-cultured	Spore Trap Type: Allergenco D
Test Method: Mold: ASTM D7391-17e1 - Standard Profile	

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 Entry					Room 271					Outside Back				
Media Expires On:	Dec 2019					Dec 2019					Dec 2019				
Notes Included:	See Analytical Notes										See Analytical Notes				
Volume:	75					75					75				
	raw ct.	RL	spores/m ³	%total	spores/m ³ SF	raw ct.	RL	spores/m ³	%total	spores/m ³ SF	raw ct.	RL	spores/m ³	%total	spores/m ³ SF
Agaricales group	3	13	40	<1%	40						4	13	53	1%	50
Alternaria	7	13	93	2%	90										
Arthrinium	1	13	13	<1%	10										
Ascospores	10	13	133	3%	130	1	13	13	3%	10	12	13	160	3%	160
Aspergillus / Penicillium	55	13	733	15%	730	6	13	80	19%	80	50	13	666	14%	670
Basidiospores	45	13	600	12%	600	7	13	93	22%	90	58	13	773	16%	770
Cercospora	1	13	13	<1%	10										
Chaetomium															
Cladosporium	114	21	2400	49%	2400	10	13	133	31%	130	121	19	2305	48%	2300
Coprinus group	3	13	40	<1%	40						1	13	13	<1%	10
Curvularia	1	13	13	<1%	10	4	13	53	12%	50	1	13	13	<1%	10
Drechslera / Bipolaris group	2	13	27	<1%	30						1	13	13	<1%	10
Helicomyces	1	13	13	<1%	10										
Hyphal / Spore Fragments - Dematiace	30	13	400	8%	400	3	13	40	9%	40	31	13	413	9%	410
Hyphal / Spore Fragments - Hyaline															
Memnoniella															
Myxomycete / Rust / Smut	23	13	307	6%	310	1	13	13	3%	10	26	13	347	7%	350
Non-specified Fungal Spore(s)	3	13	40	<1%	40						3	13	40	<1%	40
Oidium	1	13	13	<1%	10										
Oscillatoria											1	13	13	<1%	10
Stachybotrys															
TOTALS	300		4878	100%	4900	32		425	100%	420	309		4809	100%	4800
Analyst	M. Garcia					M. Garcia					M. Garcia				
Analysis Date	2/18/2019					2/18/2019					2/18/2019				
Debris Rating	3					3					3				
Debris Composition															
Fibers	1/5					1/5					1/5				
Inorganic/Other	3/5					1/5					1/5				
Insect Parts	0/5					0/5					0/5				
Pollen	1/5					0/5					2/5				
Skin/Dander	0/5					3/5					0/5				

End of Data Detail section
19F-01785

SMLMS v12.97



IAQ Mold Report

Analytical Notes

TDLR License No.: LAB0117

AIHA EMPAT ID: 102577

2051 Valley View Lane

Farmers Branch, TX 75234 Phone: (972) 241-8460

Client : Ensolum, LLC

Project : Delay MS, Room 271

Project # : 01A1288009

Sample Type: Spore Trap, Non-cultured

Test Method: Mold: ASTM D7391-17e1 - Standard Profile

Lab Job No. : 19F-01785

Report Date : 02/19/2019 2:08 PM

Sample Date : 02/14/2019

Spore Trap Type: Allergenco D

Page 1 of 2

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 1 : Outside Front Entry

Notes: Please note: the minimum detection limit for Cladosporium is 21 spores / cubic meter. When comparing results to other samples, use calculated results, not raw numbers.

Sample No 3 : Outside Back

Notes: Please note: the minimum detection limit for Cladosporium 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

TDLR License No.: LAB0117

AIHA EMPAT ID: 102577

2051 Valley View Lane

Farmers Branch, TX 75234 Phone: (972) 241-8460

Client : Ensolum, LLC

Project : Delay MS, Room 271

Project # : 01A1288009

Sample Type: Spore Trap, Non-cultured

Test Method: Mold: ASTM D7391-17e1 - Standard Profile

Lab Job No. : 19F-01785

Report Date : 02/19/2019 2:08 PM

Sample Date : 02/14/2019

Spore Trap Type: Allergenco D

Page 2 of 2

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-01785

IAQ Mold Report

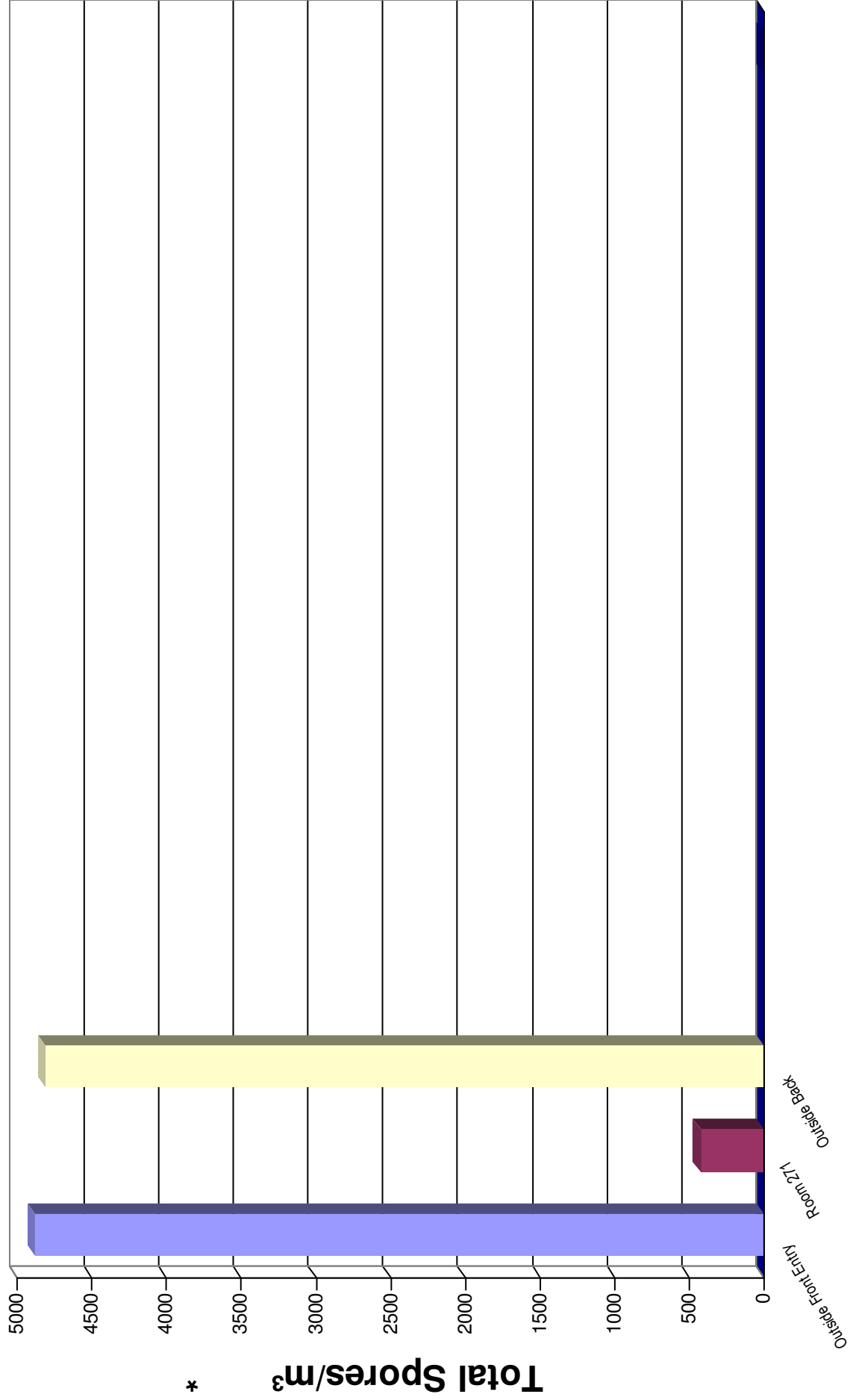
Supplemental Overview

TDLR License No.: LAB0117
AIHA EMPAT ID: 102577

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

Client : Ensolum, LLC
Project : Delay MS, Room 271
Project # : 01A1288009

Lab Job No. 19F-01785
Report Date 02/19/2019 2:08 PM
Sample Date : 02/14/2019



IAQ Mold Report

Supplemental Overview

TDLR License No.: LAB0117
 AIHA EMPAT ID: 102577



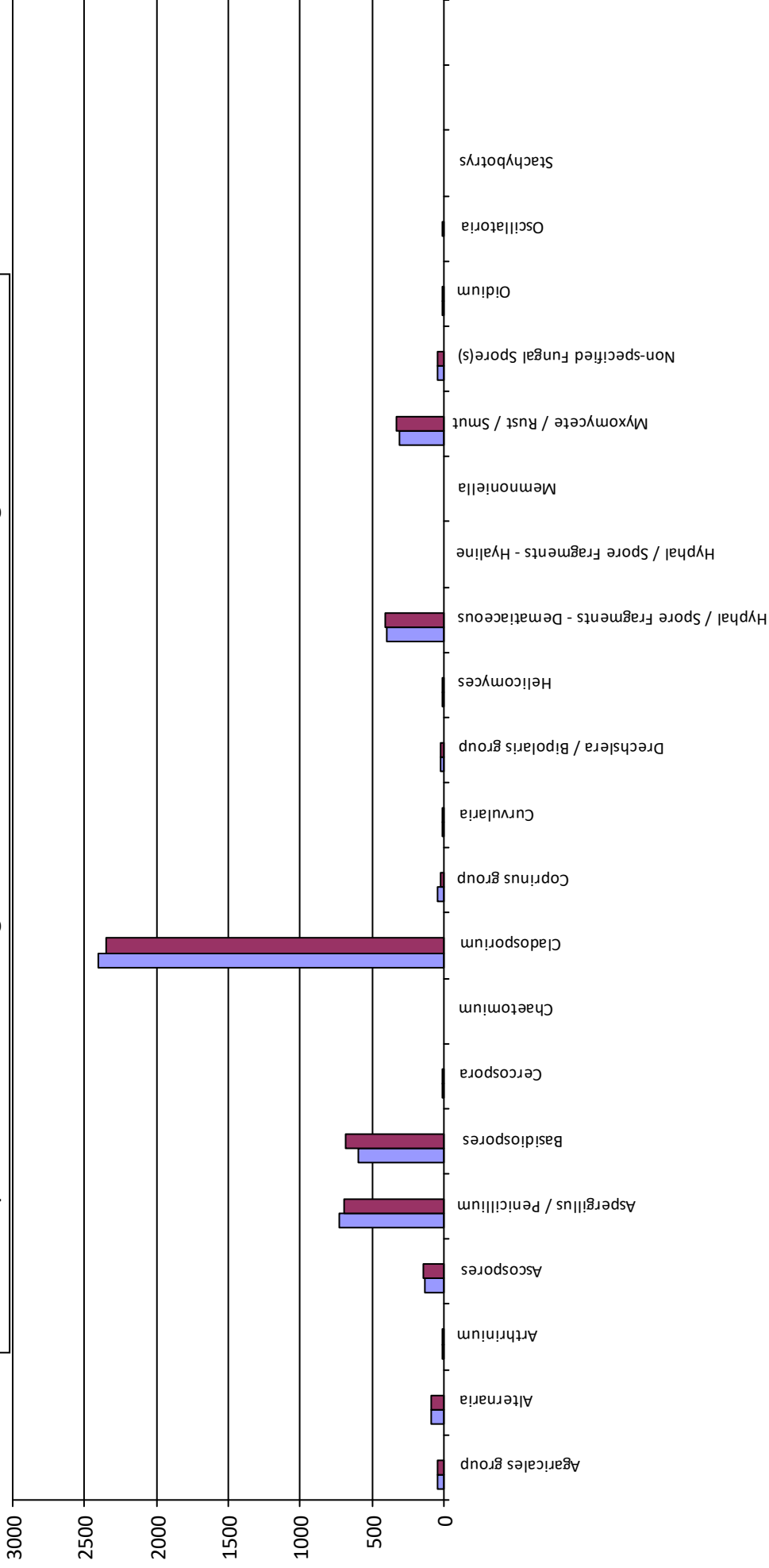
2051 Valley View Lane
 Farmers Branch, TX 75234 Phone: (972) 241-8460

Client : Ensolum, LLC
Project : Delay MS, Room 271
Project # : 01A1288009

Lab Job No. 19F-01785
Report Date 02/19/2019 2:08 PM
Sample Date : 02/14/2019

Outside Front Entry

Sample
 Average Reference 1
 Average Reference 2



Average Reference 1 = Outside Front Entry, Outside Back

IAQ Mold Report

Supplemental Overview

TDLR License No.: LAB0117
 AIHA EMPAT ID: 102577

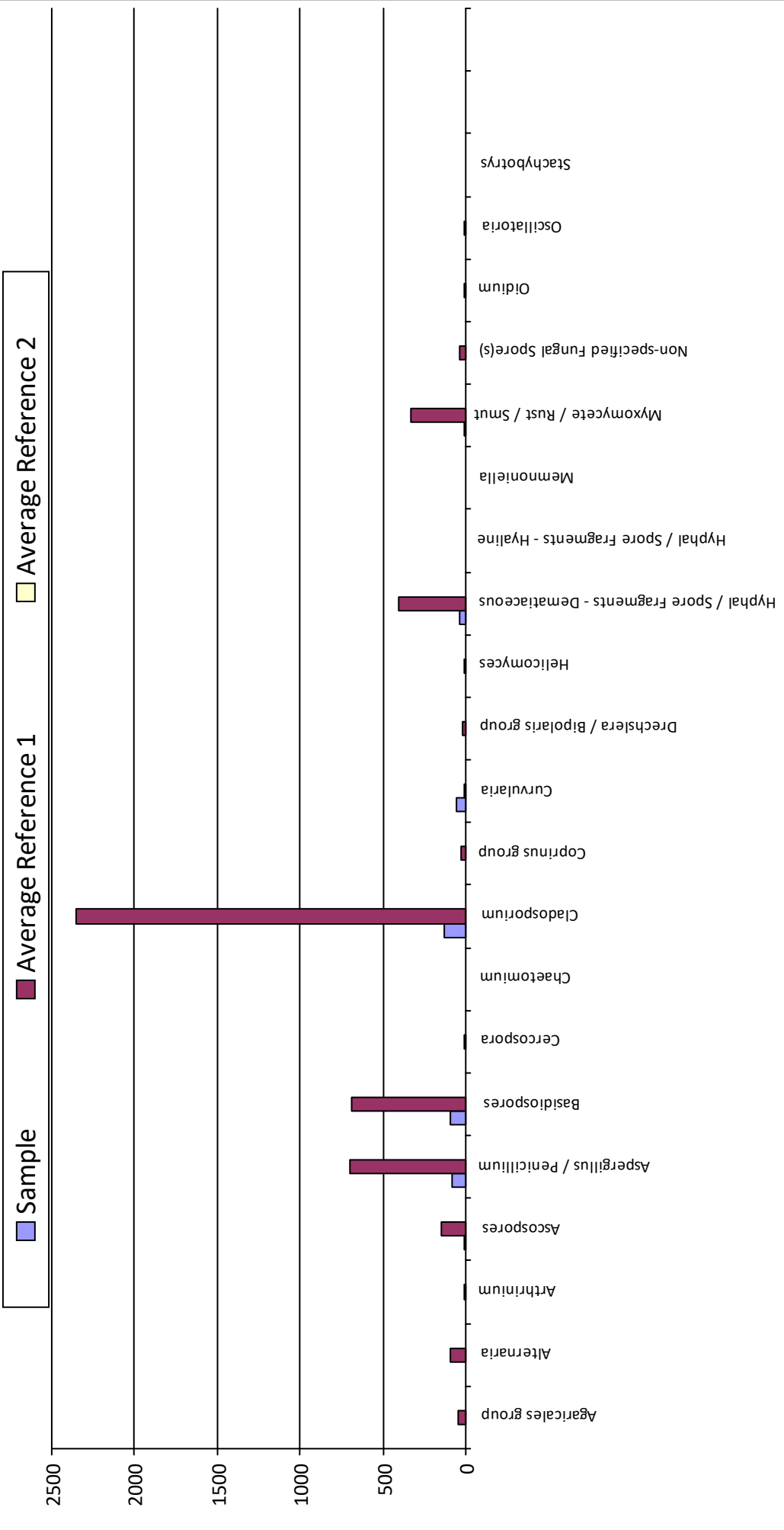


2051 Valley View Lane
 Farmers Branch, TX 75234 Phone: (972) 241-8460

Client : Ensolum, LLC
Project : Delay MS, Room 271
Project # : 01A1288009

Lab Job No. 19F-01785
Report Date 02/19/2019 2:08 PM
Sample Date : 02/14/2019

Room 271



Average Reference 1 = Outside Front Entry, Outside Back

IAQ Mold Report

Supplemental Overview

TDLR License No.: LAB0117
 AIHA EMPAT ID: 102577



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

Client : Ensolum, LLC

Project : Delay MS, Room 271

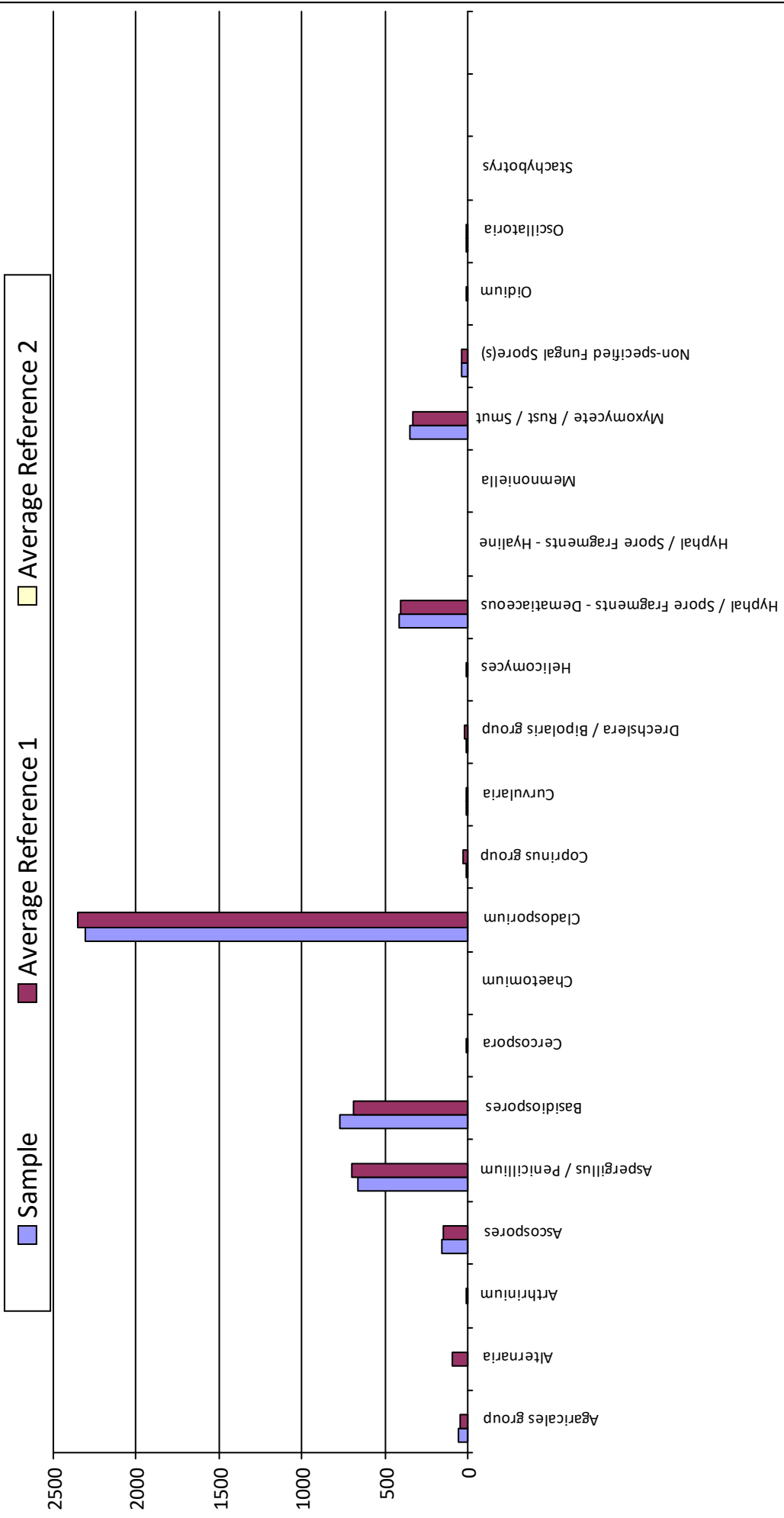
Project # : 01A1288009

Lab Job No. 19F-01785

Report Date 02/19/2019 2:08 PM

Sample Date : 02/14/2019

Outside Back



Average Reference 1 = Outside Front Entry, Outside Back

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.