H O V E Y
ENVIRONMENTAL
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MOISTURE & MOLD

ASSESSMENT

SAMPLE REPORT

Prepared for:

Copies provided to:

Prepared by:
Caroline Hovey CMC, CES, REA-08115
Principal Environmental Specialist
Hovey Environmental LLC

Report #

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STATEMENT OF LIMITATIONS

The following mold assessment is based on findings of the physical inspection and testing. Findings are current and accurate for the date and time they were found, but do not reflect expected or predictable mold growth and infestation on and within the property. This report addresses only those areas physically inspected and sampled. Hovey Environmental LLC is not responsible or liable for the non-discovery of any water damage, water problems, mold contamination, or other conditions of the Subject Property which may occur or may become evident after the inspection and testing time and date. Hovey Environmental LLC is neither an insurer nor guarantor against water problems, mold problems or other defects in the Subject Property and improvements, systems or components inspected. Hovey Environmental LLC makes no warranty, expressed or implied as to the fitness for use of condition of the systems or components inspected. Hovey Environmental LLC assumes no responsibility for the cost of repairing any water problems, mold problems or any other defects or conditions. Hovey Environmental LLC is not responsible or liable for any future water problems, mold problems or any other future failures or repairs. Remediation recommendations are suggested guidelines, not a detailed remediation protocol. More or less actions may be necessary and will be determined by the remediation company chosen by the property owners or other responsible party.

The findings, testing, opinions, and remediation recommendations contained within this report meet with the standards set forth by guidelines of Bioaerosols Assessment and Control (ACGIH, 1999); the *Worldwide Exposure Standards for Mold and Bacteria* (Brandys, 2003); guidelines of the American Industrial Hygienists Association; and the Institute of Inspection, Cleaning and Restoration Certification S520 *Mold Remediation Standard*.

PROJECT LOCATION & ASSESSMENT PROTOCOL

A mold assessment and testing was performed on March 20, 2018 by Caroline Hovey, Principal Environmental Specialist, of Hovey Environmental LLC. The subject property is located at XXXXX in San Diego, California.

The subject property is a three-level, single-family home built into the hillside on the east side of the home. The assessment was requested by XXXXXXX, the potential buyer. The scope of work included all accessible areas. Areas covered by furniture or personal items may not have been accessible at the time of the assessment and therefore cannot be included in the report. The region has not received appreciable rainfall in several months. Moisture intrusion due to rain or storm events may not be evident at this time.

The following diagnostic tools were used in the physical investigation:

- Visual assessment of interior and exterior areas of the subject property
- Infrared camera scan: indicates variations in temperature of building materials
- Protimeter moisture meter: indicates relative moisture of building materials up to one inch deep; used along walls, floors, ceilings, and other building materials
    - Less than 15% moisture indicates normal moisture levels (low moisture)
    - Between 15% and 25% warrant further investigation (moderate moisture)
    - Greater than 25% indicates excessive moisture (high moisture)

Seven samples were collected at the subject property. Air-o-cell cassettes and sampling pump calibrated to 15 liters per minute were used to collect air samples. All ambient air samples were collected for 5 minutes. An outdoor ambient air sample was collected to establish background levels of mold spores naturally occurring in the area. Indoor ambient air samples were collected in the lower hall, lower bathroom, lower north bedroom, lower center bedroom, and lower south bedroom. A swab sample was collected in the family room. All samples were delivered to EM Lab P&K for analysis. Laboratory results are provided in Appendix A.

FINDINGS, SAMPLE RESULTS, & RECOMMENDATIONS

Relative moisture levels were recorded in various places throughout the assessment area. Moisture data and a summary of on-site evaluation findings are provided in Table 1.

Table 1. Summary of on-site evaluation findings.

	Walls	Floor	Ceiling	Windows	Sink	Toilet	Shower/Tub	Comments
Upper Landing	Low	Low	Low					
Office	Low	Low	Low	Low				
Master Bathroom	Low	Low	Low	Low	Low	Low	Low	
Master Bedroom	Low	Low	Low	Low				
Garage	Low	Low	Low					
Kitchen	Low	Low	Low	Low	Low			
Dining Room	Low	Low	Low	Low				
Family Room	Mid	Low	Low	Low				Elevated moisture readings on wall right of slider; mold growth on sub-floor in front of slider
Lower Hall	Low	Low	Low					Most of back wall inaccessible; efflorescence on block retaining wall below HVAC
Lower Bathroom	Mid	Low	Low		Low	Low	Low	Elevated moisture readings at base of wall in SE corner
Lower North Bedroom	Mid	Low	Mid	Mid				Elevated moisture on windowsill and wall below window; stain on ceiling near center of room
Lower Center Bedroom	Low	Low	Low	Low				Paint bubble near SW corner
Lower South Bedroom	Low	Low	Low	Low				

Results of samples taken at the subject property are provided in Appendix A. Air samples were taken to establish the concentration of spores in ambient air. The total concentration of mold spores per cubic meter of air is given in Table 2. The concentration of individual mold types (spores/m^3) from each sample is given in Figure 1. Results from the outdoor sample are shown by the dark blue bars. This data can be used as a basis for comparison for indoor samples. Under normal conditions, the concentration of spores and types present should be consistent with that captured outside.

Table 2. Summary of sample results.

Sample Location	**Concentration (spores/m^3)**	**Mold Type(s) of Concern**
Outside	4,500	n/a
Family Room	n/a	Stachybotrys
Lower Hall	2,700	None
Lower Bathroom	4,300	*Penicillium/Aspergillus, Stachybotrys*
Lower North Bedroom	8,700	*Chaetomium, Penicillium/Aspergillus, Stachybotrys*
Lower Center Bedroom	2,300	*Stachybotrys*
Lower South Bedroom	2,900	None

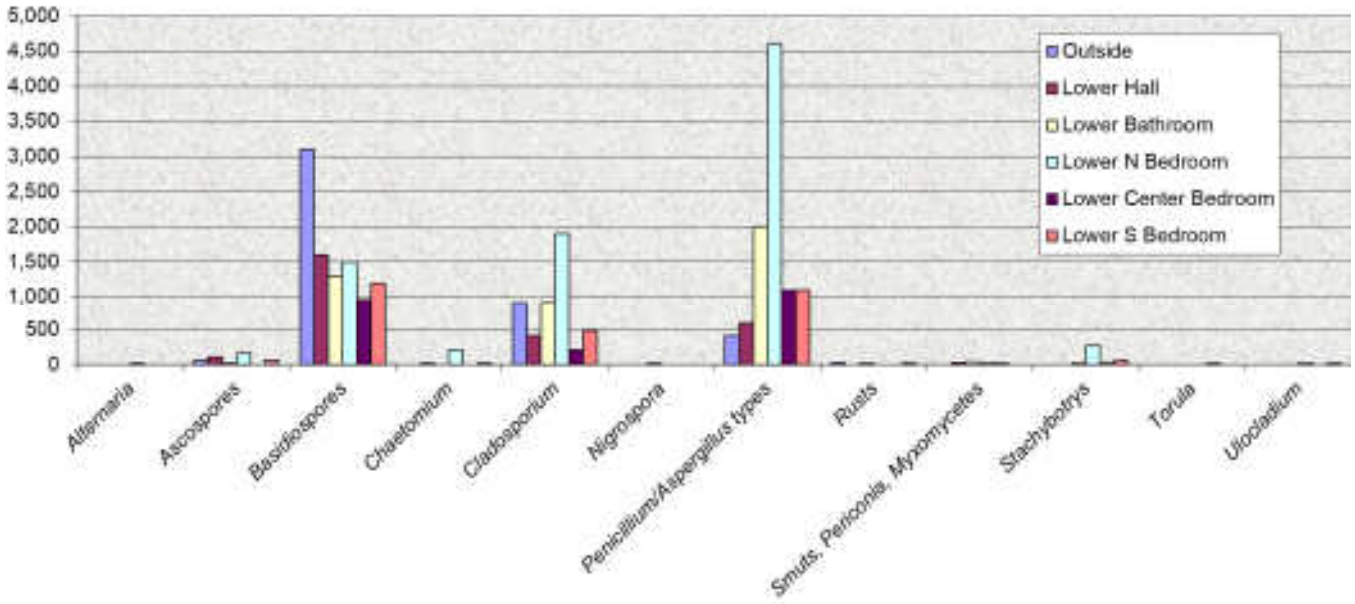


Figure 1. Concentration of mold types in air samples.

FAMILY ROOM:

FINDINGS

Moderate moisture readings (approximately 20%) were detected at the base of the west wall to the right of the slider in the family room. Mold growth was noted along the bottom edge of the baseboard as well as on the sub-floor below the carpet.

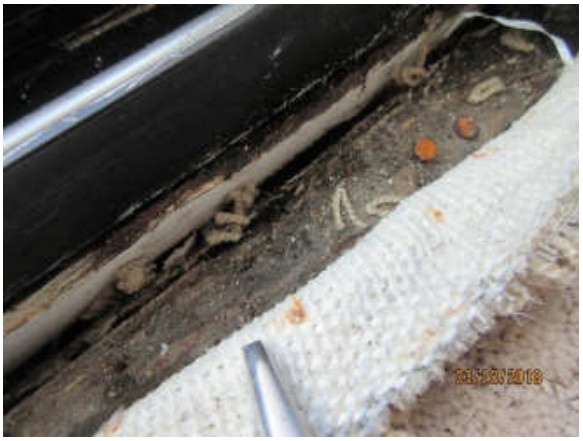
SAMPLE RESULTS

Results of the swab sample collected from the family room showed the presence of *Stachybotrys* mold growth. This is an indicator organism whose presence is indicative of an abnormal mold condition due to prolonged or repetitive moisture exposure.

RECOMMENDATIONS

Due to the presence of abnormal mold conditions and elevated moisture levels, remediation (treatment) is recommended in the family room. The area should be contained prior to removal of affected materials. The carpet, pad, and tack strips should be removed and discarded. Baseboards, drywall, and insulation should be removed from the lower two feet (minimum) of the walls to the left and right of the slider. All exposed surfaces should be treated as outlined on page 12. Additional removal and/or treatment may be necessary and can be determined as part of the remediation process. It is important that all moisture sources be evaluated and corrected. A window and/or deck specialist should be retained to determine how moisture is penetrating around the slider and determine appropriate corrective action needed.

Elevated moisture readings on wall next to slider



Mold growth on tack strip and subfloor in front of slider

LOWER HALL:

FINDINGS

The east wall in the lower hall is built below grade. Most of this wall was inaccessible due to personal items in the closet and the position of the washer and dryer. The register was removed from below the HVAC closet and efflorescence was noted on the block retaining wall. This indicates there may be some moisture intrusion occurring through the retaining wall. The HVAC inspector indicated there is mold growth on the coils in the HVAC.

SAMPLE RESULTS

Results of the air sample collected in the lower hall showed overall low mold spore concentrations.

RECOMMENDATIONS

Additional investigation is recommended to determine the extent of moisture intrusion through the retaining wall at the east side of the home. Once the personal items are removed, exploratory cuts should be made in the east wall to inspect the wall cavities. If mold growth is present on the backside of the drywall the impacted area should be removed along with an additional two feet in each direction. The HVAC inspector should be consulted to determine if the mold growth present can be cleaned or if the unit must be replaced. In either case, duct cleaning is recommended to remove any potential cross-contamination.

Efflorescence on retaining wall below HVAC

LOWER BATHROOM:

FINDINGS

Moderate moisture readings (approximately 19% - 20%) were detected at the base of the east and south walls at the SE corner of the lower bathroom. Both of these walls are below grade. It is unclear if the elevated moisture readings in this area are due to moisture intrusion through the retaining wall or from a leak in the nearby toilet.

SAMPLE RESULTS

Results of the air sample collected in the lower bathroom showed elevated levels of *Penicillium/Aspergillus* mold spores along with the presence of *Stachybotrys* mold spores.

RECOMMENDATIONS

Due to the presence of abnormal mold conditions and elevated moisture levels, remediation (treatment) is recommended in the lower bathroom. The area should be contained prior to removal of affected materials. The toilet should be removed. Baseboards, drywall, and insulation should be removed from the lower two feet (minimum) of the east and south walls. All exposed surfaces should be treated as outlined on page 12. Additional removal and/or treatment may be necessary and can be determined as part of the remediation process. It is important that all moisture sources be evaluated and corrected.

Elevated moisture readings on east wall

Elevated moisture readings on south wall

LOWER NORTH BEDROOM:

FINDINGS

Several areas of concern were noted in the lower north bedroom. Elevated moisture readings (19% - 26%) were detected on the windowsill and base of the wall below the window. The baseboard was swollen, indicating prolonged moisture exposure. The wooden windowsill was rotted. Rot was also noted around the exterior of the patio door. At the top of the west wall, drip marks were noted below the drywall nails. This is likely due to moisture intrusion below the slider in the family room directly above. Near the center of the room, a small area of staining and elevated moisture (18%) was noted on the ceiling.

SAMPLE RESULTS

Results of the air sample collected in the north bedroom showed elevated concentrations of *Chaetomium, Penicillium/Aspergillus,* and *Stachybotrys* mold spores.

RECOMMENDATIONS

Due to the presence of abnormal mold conditions and elevated moisture levels, remediation (treatment) is recommended in the north bedroom. The area should be contained prior to removal of affected materials. The carpet, pad, and tack strips should be removed. Baseboards, drywall, and insulation should be removed from the lower two feet (minimum) of the west wall below the window, south and west walls next to the patio door, top of the west wall, ceiling within two feet (minimum) of the west wall, and center of the ceiling in the area of staining. All exposed surfaces should be treated as outlined on page 12. Additional removal and/or treatment may be necessary and can be determined as part of the remediation process. It is important that all moisture sources be evaluated and corrected.

Moisture damage on windowsill

Elevated moisture readings on windowsill

Elevated moisture readings at base of wall below window

Swollen baseboard below window

Drip marks at top of west wall

Elevated moisture readings on ceiling near center of room

LOWER CENTER BEDROOM:

FINDINGS

Bubbling paint was noted on the ceiling at the SW corner of the lower center bedroom. Moisture readings were low (<15%) at the time of the evaluation; however, the drywall was soft indicating prolonged moisture exposure. The baseboard at the base of the wall next to the slider was separating from the wall, which may be an indication of previous moisture exposure.

SAMPLE RESULTS

Results of the air sample collected in the lower center bedroom showed low levels of *Stachybotrys* mold spores. This may be due to a localized source of growth or cross-contamination from other areas impacted on the lower level including the north bedroom and/or HVAC unit.

RECOMMENDATIONS

Additional investigation is needed to determine if there is a localized source of mold growth in the lower center bedroom. Exploratory cuts are recommended in the ceiling at the SW corner of the room as well as the base of the wall next to the slider. If mold growth is present within the ceiling or wall cavity, the impacted drywall should be removed along with an additional two feet in each direction and the exposed surfaces treated as outlined on page 12.

Bubbled paint at SW corner of room

LOWER SOUTH BEDROOM:

FINDINGS

The lower south bedroom was noted as a potential area of concern because the south wall is partially below grade. Moisture readings on the exposed building materials were low (<15%) at the time of the evaluation.

SAMPLE RESULTS

Results of the air sample collected in the lower south bedroom showed low total mold spore concentrations.

RECOMMENDATIONS

Based on the findings of the on-site evaluation and sample results, mold remediation is not recommended in the lower south bedroom at this time.

GENERAL REMEDIATION GUIDELINES

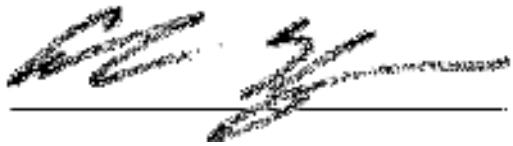
The Institute of Inspection, Cleaning, and Restoration Certification S520 *Mold Remediation Standard* has established guidelines that dictate the type of practices necessary to deal with mold infestations in indoor environments. Mold treatment should be conducted by a professional remediation company with training and experience dealing with mold. Proper remediation protocol may include the following, though additional measures may be necessary and will be determined by the remediation company chosen.

- Contain the affected area under negative pressure
- Remove porous materials in the affected areas as well as an additional 2 feet in each direction.
- Visually inspect studs within walls; wood with indications of rot should be removed
- Abrade and/or surface treat studs, hard woods, and other non-porous materials
- Dry and hepa-vacuum the area
- Repeat surface treatment and hepa-vacuuming as needed
- Run an air scrubber in the area for 24 – 48 hours
- Perform post-remediation verification (PRV) by a certified microbial consultant; **Post-remediation verification is not included in the initial assessment and testing described in this report; additional assessment and per sample fees apply**

SIGNATURE OF INSPECTOR

The findings, testing, opinions, and remediation recommendations contained within this report meet with the standards set forth by guidelines of Bioaerosols Assessment and Control (ACGIH, 1999); the *Worldwide Exposure Standards for Mold and Bacteria* (Brandys, 2003); guidelines of the American Industrial Hygienists Association; and the Institute of Inspection, Cleaning and Restoration Certification S520 *Mold Remediation Standard*.

I certify that the above findings, opinions, and recommendations are true and accurate to the best of my knowledge, and represent the most current knowledge of mold assessment and remediation methods.



Caroline Hovey, CMC, CES, REA-08115
Principal Environmental Specialist
Hovey Environmental LLC

APPENDIX A

EM Lab P&K

Sample Results

EMLab P&K
A TestAmerica Company

Report for:

Ms. Caroline Hovey
Hovey Environmental
2929 Chatsworth Blvd.
San Diego, CA 92106

Regarding: Project: [redacted]
EML ID: [redacted]

Approved by:

Technical Manager
Pam Hui

Dates of Analysis:
Spore trap analysis: 03-20-2018 and 03-21-2018

Service SOPs: Spore trap analysis (EM-MY-S-1038)
AIHA-LAP, LLC accredited service, Lab ID #160266

EMLab P&K
8304 Clairemont Mesa Blvd, Suite 103, San Diego, CA 92111
(866) 888-6653 Fax (623) 780-7695 www.emlab.com

Client: Hovey Environmental
C/O: Ms. Caroline Hovey
Re: [redacted]

Date of Sampling: 03-20-2018
Date of Receipt: 03-20-2018
Date of Report: 03-22-2018

SPORE TRAP REPORT: NON-VIABLE METHODOLOGY

Location:	1: Outside			3: Lower hall		
Comments (see below)	A			B		
Lab ID-Version‡:	[redacted]			[redacted]		
Analysis Date:	03/20/2018			03/20/2018		
	raw ct.	% read	spores/m3	raw ct.	% read	spores/m3
Alternaria						
Ascospores	1	25	53	2	25	110
Basidiospores	49/36	25/100	3,100	27/10	25/100	1,600
Chaetomium				1	100	13
Cladosporium	17	25	910	5/11	25/100	410
Myrothecium						
Nigrospora						
Other colorless						
Penicillium/Aspergillus types†	4/15	25/100	410	9/8	25/100	590
Pithomyces						
Rusts	2	100	27			
Smuts, Periconia, Myxomycetes				2	100	27
Stachybotrys						
Stemphylium						
Torula						
Ulocladium						
Zygomycetes						
Background debris (1-4+)††	1+			1+		
Hyphal fragments/m3	13			13		
Pollen/m3	27			13		
Skin cells (1-4+)	< 1+			< 1+		
Sample volume (liters)	75			75		
§ TOTAL SPORES/m3			4,500			2,700

Comments: A) 15 of the raw count *Penicillium/Aspergillus* type spores were present as a single clump. B) 11 of the raw count *Cladosporium* spores were present as a single clump. 8 of the raw count *Penicillium/Aspergillus* type spores were present as a single clump.

Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample, indicating a raw count of <1 spore.
† The spores of *Aspergillus* and *Penicillium* (and others such as *Acremonium, Paecilomyces*) are small and round with very few distinguishing characteristics. They cannot be differentiated by non-viable sampling methods. Also, some species with very small spores are easily missed, and may be undercounted.
††Background debris indicates the amount of non-biological particulate matter present on the trace (dust in the air) and the resulting visibility for the analyst. It is rated from 1+ (low) to 4+ (high). Counts from areas with 4+ background debris should be regarded as minimal counts and may be higher than reported. It is important to account for samples volumes when evaluating dust levels.

The analytical sensitivity is the spores/m^3 divided by the raw count, expressed in spores/m^3. The limit of detection is the analytical sensitivity (in spores/m^3) multiplied by the sample volume (in liters) divided by 1000 liters.

For more information regarding analytical sensitivity, please contact QA by calling the laboratory.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".
§ Total Spores/m3 has been rounded to two significant figures to reflect analytical precision.

EMLab P&K
8304 Clairemont Mesa Blvd, Suite 103, San Diego, CA 92111
(866) 888-6653 Fax (623) 780-7695 www.emlab.com

Client: Hovey Environmental
C/O: Ms. Caroline Hovey
Re: [redacted]

Date of Sampling: 03-20-2018
Date of Receipt: 03-20-2018
Date of Report: 03-22-2018

SPORE TRAP REPORT: NON-VIABLE METHODOLOGY

Location:	4: Lower bathroom			5: Lower N. bedroom		
Comments (see below)	C			D		
Lab ID-Version‡:	[redacted]			[redacted]		
Analysis Date:	03/21/2018			03/21/2018		
	raw ct.	% read	spores/m3	raw ct.	% read	spores/m3
Alternaria				1	100	13
Ascospores	1	100	13	2/4	25/100	160
Basidiospores	22/9	25/100	1,300	23/21	25/100	1,500
Chaetomium				16	100	210
Cladosporium	17	25	910	36	25	1,900
Fusarium						
Myrothecium						
Nigrospora	1	100	13			
Other colorless						
Penicillium/Aspergillus types†	35/13	25/100	2,000	76/42	25/100	4,600
Pithomyces						
Rusts	1	100	13			
Smuts, Periconia, Myxomycetes	3	100	40	2	100	27
Stachybotrys	2	100	27	20	100	270
Stemphylium						
Torula						
Ulocladium				2	100	27
Zygomycetes						
Background debris (1-4+)††	1+			4+		
Hyphal fragments/m3	27			120		
Pollen/m3	< 13			27		
Skin cells (1-4+)	< 1+			1+		
Sample volume (liters)	75			75		
§ TOTAL SPORES/m3			4,300			8,700

Comments: C) 13 of the raw count *Penicillium/Aspergillus* type spores were present as a single clump. D) 42 of the raw count *Penicillium/Aspergillus* type spores were present as a single clump.

Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample, indicating a raw count of <1 spore.
† The spores of *Aspergillus* and *Penicillium* (and others such as *Acremonium, Paecilomyces*) are small and round with very few distinguishing characteristics. They cannot be differentiated by non-viable sampling methods. Also, some species with very small spores are easily missed, and may be undercounted.
††Background debris indicates the amount of non-biological particulate matter present on the trace (dust in the air) and the resulting visibility for the analyst. It is rated from 1+ (low) to 4+ (high). Counts from areas with 4+ background debris should be regarded as minimal counts and may be higher than reported. It is important to account for samples volumes when evaluating dust levels.

The analytical sensitivity is the spores/m^3 divided by the raw count, expressed in spores/m^3. The limit of detection is the analytical sensitivity (in spores/m^3) multiplied by the sample volume (in liters) divided by 1000 liters.

For more information regarding analytical sensitivity, please contact QA by calling the laboratory.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".
§ Total Spores/m3 has been rounded to two significant figures to reflect analytical precision.

EMLab P&K
8304 Clairemont Mesa Blvd, Suite 103, San Diego, CA 92111
(866) 888-6653 Fax (623) 780-7695 www.emlab.com

Client: Hovey Environmental
C/O: Ms. Caroline Hovey
Re: [redacted]

Date of Sampling: 03-20-2018
Date of Receipt: 03-20-2018
Date of Report: 03-22-2018

SPORE TRAP REPORT: NON-VIABLE METHODOLOGY

Location:	6: Lower center bedroom			7: Lower S. bedroom		
Comments (see below)	E			None		
Lab ID-Version‡:	[redacted]			[redacted]		
Analysis Date:	03/21/2018			03/21/2018		
	raw ct.	% read	spores/m3	raw ct.	% read	spores/m3
Alternaria						
Ascospores				1	25	53
Basidiospores	14/15	25/100	950	21/7	25/100	1,200
Chaetomium				1	100	13
Cladosporium	4	25	210	9	25	480
Epicoccum						
Fusarium						
Myrothecium						
Nigrospora						
Other colorless						
Penicillium/Aspergillus types†	10/46	25/100	1,100	20	25	1,100
Pithomyces						
Rusts				1	100	13
Smuts, Periconia, Myxomycetes	1	100	13			
Stachybotrys	1	100	13	4	100	53
Stemphylium						
Torula	1	100	13			
Ulocladium				1	100	13
Zygomycetes						
Background debris (1-4+)††	1+			1+		
Hyphal fragments/m3	13			< 13		
Pollen/m3	13			< 13		
Skin cells (1-4+)	< 1+			< 1+		
Sample volume (liters)	75			75		
§ TOTAL SPORES/m3			2,300			2,900

Comments: E) 46 of the raw count *Penicillium/Aspergillus* type spores were present as a single clump.

Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample, indicating a raw count of <1 spore.
† The spores of *Aspergillus* and *Penicillium* (and others such as *Acremonium, Paecilomyces*) are small and round with very few distinguishing characteristics. They cannot be differentiated by non-viable sampling methods. Also, some species with very small spores are easily missed, and may be undercounted.
††Background debris indicates the amount of non-biological particulate matter present on the trace (dust in the air) and the resulting visibility for the analyst. It is rated from 1+ (low) to 4+ (high). Counts from areas with 4+ background debris should be regarded as minimal counts and may be higher than reported. It is important to account for samples volumes when evaluating dust levels.

The analytical sensitivity is the spores/m^3 divided by the raw count, expressed in spores/m^3. The limit of detection is the analytical sensitivity (in spores/m^3) multiplied by the sample volume (in liters) divided by 1000 liters.

For more information regarding analytical sensitivity, please contact QA by calling the laboratory.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".
§ Total Spores/m3 has been rounded to two significant figures to reflect analytical precision.

EMLab P&K
A TestAmerica Company

Report for:

Ms. Caroline Hovey
Hovey Environmental
2929 Chatsworth Blvd.
San Diego, CA 92106

Regarding: Project: [redacted]
EML ID: [redacted]

Approved by:

Technical Manager
Pam Hui

Dates of Analysis:
Direct microscopic exam (Qualitative): 03-20-2018

Service SOPs: Direct microscopic exam (Qualitative) (EM-MY-S-1039)
AIHA-LAP, LLC accredited service, Lab ID #160266

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(866) 888-6653 Fax (623) 780-7695 www.emlab.com

Client: Hovey Environmental
C/O: Ms. Caroline Hovey
Re: [redacted]

Date of Sampling: 03-20-2018
Date of Receipt: 03-20-2018
Date of Report: 03-22-2018

DIRECT MICROSCOPIC EXAMINATION REPORT

Background Debris and/or Description	Miscellaneous Spores Present*	MOLD GROWTH: Molds seen with underlying mycelial and/or sporulating structures†	Other Comments††	General Impression
Lab ID-Version‡: 8910681-1, Analysis Date: 03/20/2018: Swab sample 2: Family room				
Light	Very few	4+ *Stachybotrys* species (spores, hyphae, conidiophores)	None	Mold growth

* Indicative of normal conditions, i.e. seen on surfaces everywhere. Includes basidiospores (mushroom spores), myxomycetes, plant pathogens such as ascospores, rusts and smuts, and a mix of saprophytic genera with no particular spore type predominating. Distribution of spore types seen mirrors that usually seen outdoors.

† Quantities of molds seen growing are listed in the MOLD GROWTH column and are graded <1+ to 4+, with 4+ denoting the highest numbers.

†† Some comments may refer to the following: Most surfaces collect a mix of spores which are normally present in the outdoor environment. At times it is possible to note a skewing of the distribution of spore types, and also to note "marker" genera which may indicate indoor mold growth. Marker genera are those spore types which are present normally in very small numbers, but which multiply indoors when conditions are favorable for growth.

‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".
The limit of detection is < 1+ when mold growth is detected.

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Client: Hovey Environmental
C/O: Ms. Caroline Hovey
Re: [redacted]

Date of Sampling: 03-20-2018
Date of Receipt: 03-20-2018
Date of Report: 03-22-2018

MoldRANGE™: Extended Outdoor Comparison

Outdoor Location: 1, Outside

Fungi Identified	Outdoor data	Typical Outdoor Data for: March in California† (n‡=26832)						Typical Outdoor Data for: The entire year in California† (n‡=268941)					
	spores/m3	very low	low	med	high	very high	freq %	very low	low	med	high	very high	freq %
Generally able to grow indoors*													
Alternaria	-	13	13	27	53	82	45	13	13	27	67	110	53
Bipolaris/Drechslera group	-	7	13	13	27	43	8	7	13	13	27	53	12
Chaetomium	-	7	13	13	27	40	12	8	13	13	27	44	19
Cladosporium	910	110	160	430	1,100	1,900	95	110	210	610	1,700	2,800	97
Curvularia	-	7	10	13	27	40	2	7	13	13	27	53	7
Nigrospora	-	7	10	13	13	27	4	7	13	13	33	53	9
Penicillium/Aspergillus types	410	53	53	200	480	790	79	53	100	210	640	1,000	83
Stachybotrys	-	7	13	13	27	53	3	7	13	13	33	67	4
Torula	-	8	13	13	40	67	8	10	13	13	40	67	11
Ulocladium	-	7	13	13	27	29	7	10	13	13	27	40	10
Seldom found growing indoors**													
Ascospores	53	27	53	160	490	910	77	27	53	110	370	770	70
Basidiospores	3,100	67	120	430	1,500	2,900	96	53	80	270	1,100	2,500	92
Rusts	27	13	13	13	53	93	24	13	13	17	53	93	26
Smuts, Periconia, Myxomycetes	-	13	13	27	67	120	56	13	13	40	120	230	68
§ TOTAL SPORES/m3	4,500												

†The 'Typical Outdoor Data' represents the typical outdoor spore levels for the location and time frame indicated. The last column represents the frequency of occurrence. The very low, low, med, high, and very high values represent the 10, 20, 50, 80, and 90 percentile values of the spore type when it is detected. For example, if the frequency of occurrence is 63% and the low value is 53, it would mean that the given spore type is detected 63% of the time and, when detected, 20% of the time it is present in levels above the detection limit and below 53 spores/m3. These values are updated periodically, and if enough data is not available to make a statistically meaningful assessment, it is indicated with a dash.

§ Total Spores/m3 has been rounded to two significant figures to reflect analytical precision.

* The spores in this category are generally capable of growing on wet building materials in addition to growing outdoors. Building related growth is dependent upon the fungal type, moisture level, type of material, and other factors. *Cladosporium* is one of the predominant spore types worldwide and is frequently present in high numbers. *Penicillium/Aspergillus* species colonize both outdoor and indoor wet surfaces rapidly and are very easily dispersed. Other genera are usually present in lesser numbers.

** These fungi are generally not found growing on wet building materials. For example, the rusts and smuts are obligate plant pathogens. However, in each group there are notable exceptions. For example, agents of wood decay are members of the basidiomycetes and high counts of a single morphological type of basidiospore on an inside sample should be considered significant.

‡n = number of samples used to calculate data.

Interpretation of the data contained in this report is left to the client or the persons who conducted the field work. This report is provided for informational and comparative purposes only and should not be relied upon for any other purpose. "Typical outdoor data" are based on the results of the analysis of samples delivered to and analyzed by EMLab P&K and assumptions regarding the origins of those samples. Sampling techniques, contaminants infecting samples, unrepresentative samples and other similar or dissimilar factors may affect these results. In addition, EMLab P&K may not have received and tested a representative number of samples for every region or time period. EMLab P&K hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken or omitted in reliance upon, this report.

EMLab P&K
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Client: Hovey Environmental
C/O: Ms. Caroline Hovey
Re: [redacted]

Date of Sampling: 03-20-2018
Date of Receipt: 03-20-2018
Date of Report: 03-22-2018

MoldSTAT™: Supplementary Statistical Spore Trap Report

Outdoor Summary: 1: Outside

Species detected	Outdoor sample spores/m3 (<100 / 1K / 10K / >100K)	Typical outdoor ranges (North America)	Freq. %
Ascospores	53	13 - 230 - 6,400	77
Basidiospores	3,100	13 - 470 - 23,000	91
Cladosporium	910	27 - 510 - 9,400	90
Penicillium/Aspergillus types	410	13 - 190 - 2,600	67
Rusts	27	7 - 27 - 390	20
Smuts, Periconia, Myxomycetes	< 13	7 - 53 - 1,100	65
Total	4,500		

The "Typical outdoor ranges" and "Freq. %" columns show the typical low, medium, and high spore counts per cubic meter and the frequency of occurrence for the given spore type. The low, medium, and high values represent the 2.5, 50, and 97.5 percentile values when the spore type is detected. For example, if the low value is 53 and the frequency of occurence is 63%, it would mean that we typically detect the given spore type on 63 percent of all outdoor samples and, when detected, 2.5% of the time it is present in levels below 53 spores/m3.

Indoor Samples

Location: 3: Lower hall

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)
Result: 61%	dF: 4 Result: 11.1167 Critical value: 9.4877 Inside Similar: No	Result: 0.7273	dF: 7 Result: 0.8482 Critical value: 0.6786 Outside Similar: Yes	Score: 153 Result: Medium

Species Detected	Spores/m3 (<100 / 1K / 10K / >100K)
Ascospores	110
Basidiospores	1,600
Chaetomium	13
Cladosporium	410
Penicillium/Aspergillus types	590
Smuts, Periconia, Myxomycetes	27
Total	2,700

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MoldSTAT™: Supplementary Statistical Spore Trap Report

Location: 4: Lower bathroom

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)
Result: 95%	dF: 4 Result: 11.1167 Critical value: 9.4877 Inside Similar: No	Result: 0.7692	dF: 8 Result: 0.6190 Critical value: 0.6190 Outside Similar: Yes	Score: 278 Result: High

Species Detected	Spores/m3 (<100 / 1K / 10K / >100K)
Ascospores	13
Basidiospores	1,300
Cladosporium	910
Nigrospora	13
Penicillium/Aspergillus types	2,000
Rusts	13
Smuts, Periconia, Myxomycetes	40
Stachybotrys	27
Total	4,300

Location: 5: Lower N. bedroom

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)
Result: 193%	dF: 4 Result: 11.1167 Critical value: 9.4877 Inside Similar: No	Result: 0.5714	dF: 10 Result: 0.6152 Critical value: 0.5515 Outside Similar: Yes	Score: 300 Result: High

Species Detected	Spores/m3 (<100 / 1K / 10K / >100K)
Alternaria	13
Ascospores	160
Basidiospores	1,500
Chaetomium	210
Cladosporium	1,900
Penicillium/Aspergillus types	4,600
Smuts, Periconia, Myxomycetes	27
Stachybotrys	270
Ulocladium	27
Total	8,700

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Re: [redacted]

Date of Sampling: 03-20-2018
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MoldSTAT™: Supplementary Statistical Spore Trap Report

Location: 6: Lower center bedroom

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)
Result: 51%	dF: 4 Result: 11.1167 Critical value: 9.4877 Inside Similar: No	Result: 0.5455	dF: 8 Result: 0.5655 Critical value: 0.6190 Outside Similar: No	Score: 225 Result: Medium

Species Detected	Spores/m3 (<100 / 1K / 10K / >100K)
Basidiospores	950
Cladosporium	210
Penicillium/Aspergillus types	1,100
Smuts, Periconia, Myxomycetes	13
Stachybotrys	13
Torula	13
Total	2,300

Location: 7: Lower S. bedroom

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)
Result: 65%	dF: 4 Result: 11.1167 Critical value: 9.4877 Inside Similar: No	Result: 0.7692	dF: 8 Result: 0.8512 Critical value: 0.6190 Outside Similar: Yes	Score: 219 Result: Medium

Species Detected	Spores/m3 (<100 / 1K / 10K / >100K)
Ascospores	53
Basidiospores	1,200
Chaetomium	13
Cladosporium	480
Penicillium/Aspergillus types	1,100
Rusts	13
Stachybotrys	53
Ulocladium	13
Total	2,900

* The Friedman chi-square statistic is a non-parametric test that examines variation in a set of data (in this case, all indoor spore counts). The null hypothesis (H0) being tested is that there is no meaningful difference in the data for all indoor locations. The alternative hypothesis (used if the test disproves the null hypothesis) is that there is a difference between the indoor locations. The null hypothesis is rejected when the result of the test is greater than the critical value. The critical value that is displayed is based on the degrees of freedom (dF) of the test and a significance level of 0.05.

** An agreement ratio is a simple method for assessing the similarity of two samples (in this case the indoor sample and the outdoor summary) based on the spore types present. A score of one indicates that the types detected in one location are the same as that in the other. A score of zero indicates that none of the types detected indoors are present outdoors. Typically, an agreement of 0.8 or higher is considered high.

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Date of Sampling: 03-20-2018
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*** The Spearman rank correlation is a non-parametric test that examines correlation between two sets of data (in this case the indoor location and the outdoor summary). The null hypothesis (H0) being tested is that the indoor and outdoor samples are unrelated. The alternative hypothesis (used if the test disproves the null hypothesis) is that the samples are similar. The null hypothesis is rejected when the result of the test is greater than the critical value. The critical value that is displayed is based on the degrees of freedom (dF) of the test and a significance level of 0.05.

**** MoldSCORE™ is a specialized method for examining air sampling data. It is a score between 100 and 300, with 100 indicating a greater likelihood that the airborne indoor spores originated from the outside, and 300 indicating a greater likelihood that they originated from an inside source. The Result displayed is based on the numeric score given and will be either Low, Medium, or High, indicating a low, medium, or high likelihood that the spores detected originated from an indoor source. EMLab P&Kreserves the right to, and may at anytime, modify or change the MoldScore algorithm without notice.

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A TestAmerica Company

Report for:

Ms. Caroline Hovey
Hovey Environmental
2929 Chatsworth Blvd.
San Diego, CA 92106

Regarding: Project: [redacted]
EML ID: [redacted]

Approved by:

Technical Manager
Pam Hui

Dates of Analysis:
Direct microscopic exam (Qualitative): 03-20-2018

Service SOPs: Direct microscopic exam (Qualitative) (EM-MY-S-1039)
AIHA-LAP, LLC accredited service, Lab ID #160266

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Client: Hovey Environmental
C/O: Ms. Caroline Hovey
Re: [redacted]

Date of Sampling: 03-20-2018
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DIRECT MICROSCOPIC EXAMINATION REPORT

Background Debris and/or Description	Miscellaneous Spores Present*	MOLD GROWTH: Molds seen with underlying mycelial and/or sporulating structures†	Other Comments††	General Impression
Lab ID-Version‡: 8910681-1, Analysis Date: 03/20/2018: Swab sample 2: Family room				
Light	Very few	4+ *Stachybotrys* species (spores, hyphae, conidiophores)	None	Mold growth

* Indicative of normal conditions, i.e. seen on surfaces everywhere. Includes basidiospores (mushroom spores), myxomycetes, plant pathogens such as ascospores, rusts and smuts, and a mix of saprophytic genera with no particular spore type predominating. Distribution of spore types seen mirrors that usually seen outdoors.

† Quantities of molds seen growing are listed in the MOLD GROWTH column and are graded <1+ to 4+, with 4+ denoting the highest numbers.

†† Some comments may refer to the following: Most surfaces collect a mix of spores which are normally present in the outdoor environment. At times it is possible to note a skewing of the distribution of spore types, and also to note "marker" genera which may indicate indoor mold growth. Marker genera are those spore types which are present normally in very small numbers, but which multiply indoors when conditions are favorable for growth.

‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".
The limit of detection is < 1+ when mold growth is detected.