



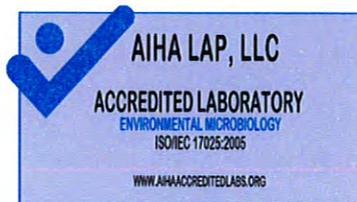
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Laboratory Report

Prepared Exclusively For:

Mold Matters
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LAB # 172958

Project: City of Traverse City

Report Date: 10/08/2014

Sampled: 10/06/2014

Project # Wellington St Warehouse

Received: 10/07/2014

Lab # E67427

Analyzed: 10/08/2014



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Project Number: Wellington St Warehouse
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Lab Number: E67427

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1 - IMS Laboratory, LLC

IMS Laboratory, LLC ("IMS") operates a state-of-the-art microbiological analysis laboratory, specializing in full service environmental microbial analyses. IMS maintains the highest levels of quality and personalized service in the industry. IMS's analytical staff includes only Certified Indoor Air Quality Professionals, Ph.D. Microbiologists, Mycologists, Microbiologists, and Biochemists. The IMS LABORATORY team's extensive experience in indoor air quality sampling techniques, microbial identification, and analytical interpretation allows us to offer our clients expert personalized service and has made IMS an industry leader.

IMS is accredited through the American Industrial Hygiene Association (AIHA) and participates in Environmental Microbiology Proficiency Testing (EMPAT). Our EMPAT number is 172958. To maintain quality control and quality assurance, IMS uses standardized procedures approved under strict AIHA guidelines. Client data information is compiled and stored in a specially designed computer management system for secure, redundant data and the ability to comply with AIHA quality system requirements. A portion of this quality system includes inter-analyst comparisons and statistical quality control using blind duplicate analyses and process blanks. Laboratory data is provided in compliance with AIHA policy modules and ISO 17025 guidelines. This data is intended for use by professionals having the necessary knowledge of the testing methods to interpret them accurately.



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2 - Laboratory Results

Location: Front Left

Sample # E67427 - 1	Sample Identification	Raw Count	Spores/cu. m	Percent(%)
Medium Type: AllergencoD	- Fungi -			
Serial # 1043391	Cladosporium	19	1,010	45.17%
Exposure: 15.00 l/min. for 5.00 min.	Pen/Asp group	11	587	26.25%
Reporting Limit: 53 Spores/cu. m	Basidiospores	10	533	23.84%
	Ganoderma	1	53	2.37%
	Stachybotrys	1	53	2.37%
	TOTALS:	42	2,240	100.00%

Background Item	Level
Dust / Debris	Low
Hyphal Fragments	Very Low
Opaque Particles	Very Low

Location: Gym Entry

Sample # E67427 - 2	Sample Identification	Raw Count	Spores/cu. m	Percent(%)
Medium Type: AllergencoD	- Fungi -			
Serial # 1043376	Cladosporium	16	853	40.01%
Exposure: 15.00 l/min. for 5.00 min.	Basidiospores	15	800	37.52%
Reporting Limit: 53 Spores/cu. m	Pen/Asp group	7	373	17.50%
	Ascospores	1	53	2.49%
	Stachybotrys	1	53	2.49%
	TOTALS:	40	2,130	100.00%

Background Item	Level
Dust / Debris	Low
Hyphal Fragments	Very Low
Opaque Particles	Very Low

Location: Outside

Sample # E67427 - 3	Sample Identification	Raw Count	Spores/cu. m	Percent(%)
Medium Type: AllergencoD	- Fungi -			
Serial # 1043386	Basidiospores	58	3,090	48.33%
Exposure: 15.00 l/min. for 5.00 min.	Cladosporium	46	2,450	38.32%
Reporting Limit: 53 Spores/cu. m	Alternaria	6	320	5.00%
	Ascospores	3	160	2.50%
	Pen/Asp group	3	160	2.50%
	Epicoccum nigrum	2	107	1.67%

- Sample data continued on next page -



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- Other -			
Pollen	2	107	1.67%
TOTALS:	120	6,390	100.00%

Background Item	Level
Dust / Debris	Low
Hyphal Fragments	Very Low
Opaque Particles	Low

Location: Front Space Rear Office

Sample # E67427 - 4	Sample Identification	Raw Count	Spores/cu. m	Percent(%)
Medium Type: AllergencoD	- Fungi -			
Serial # 1043390	Cladosporium	79	4,210	34.18%
Exposure: 15.00 l/min. for 5.00 min.	Pen/Asp group	57	3,040	24.68%
Reporting Limit: 53 Spores/cu. m	Mitospores	52	2,770	22.49%
	Stachybotrys	29	1,550	12.59%
	Basidiospores	10	533	4.33%
	Chaetomium	2	107	0.87%
	Ascospores	1	53	0.43%
	Smuts/Periconia/Myxomycetes	1	53	0.43%
	TOTALS:	231	12,300	100.00%

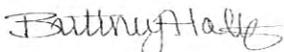
Background Item	Level
Dust / Debris	Low
Hyphal Fragments	Very Low
Opaque Particles	Low

Analytic Methods and Formulas:

IMS Laboratory Analytical Method: 2.2 (method for analyzing spore trap)
 Results are rounded to 3 significant figures per AIHA policy module 2A.5.10.5
 Spores per cubic meter is determined by: Total Spore Count x 4 x (1000/(sampling rate)x(sampling time))

Note that this report may use mold-specific units, such as Spores/cu. m and CFU/cu. m for Sample Identifications such as pollen, fiberglass fibers, and bacteria, which are not molds.

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Analyst

 10/08/2014
 Brittney Holtz, Lab Analyst



Reviewer

 10/08/2014
 Amy Lebeis, Lab Analyst



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3 - Spore Trap Comparison Chart

SAMPLING LOCATIONS

- 1: Front Left
 2: Gym Entry
 3: Outside
 4: Front Space Rear Office

Spores per Cubic Meter

Mold Name \ Location #	1	2	3	4
<i>Alternaria</i>			320	
<i>Arthrinium</i>				
Ascospores		53	160	53
Basidiospores	533	800	3,090	533
<i>Bipolaris / Drechslera group</i>				
<i>Chaetomium</i>				107
<i>Cladosporium</i>	1,010	853	2,450	4,210
<i>Curvularia</i>				
<i>Epicoccum nigrum</i>			107	
<i>Erysiphe/Oidium</i>				
<i>Fusarium</i>				
<i>Ganoderma</i>	53			
Mitospores				2,770
Pen/Asp group	587	373	160	3,040
<i>Pithomyces</i>				
<i>Polythrincium</i>				
Rust				
<i>Smuts/Periconia/Myxomycetes</i>				53
<i>Stachybotrys</i>	53	53		1,550
<i>Stemphylium</i>				
<i>Torula</i>				
Unknown Fungi				
FUNGAL TOTAL	2,240	2,130	6,290	12,300
Pollen			107	

Please refer to the Laboratory Results section for additional details.

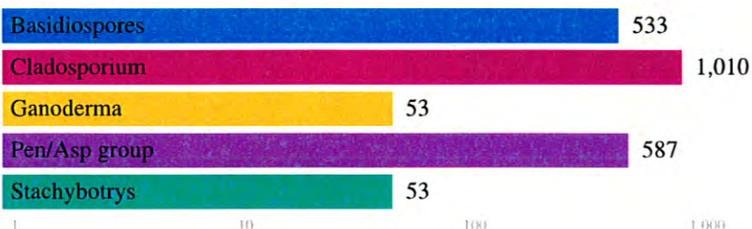


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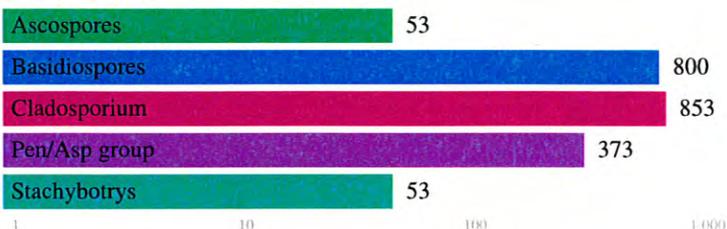
4 - Sample Comparison Graph

Spore Trap Samples - Spores per Cubic Meter

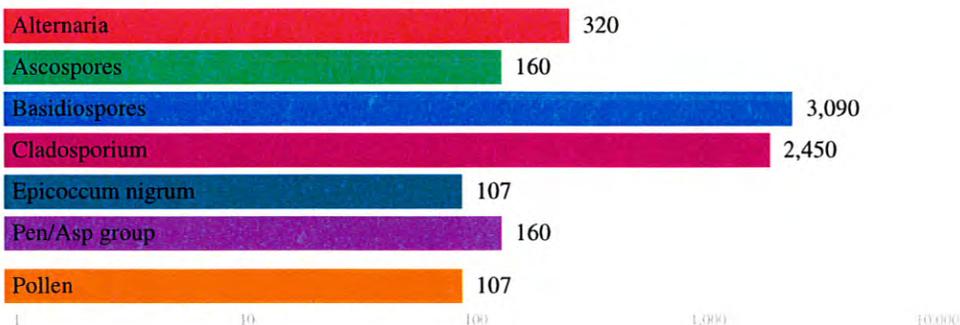
Front Left



Gym Entry



Outside

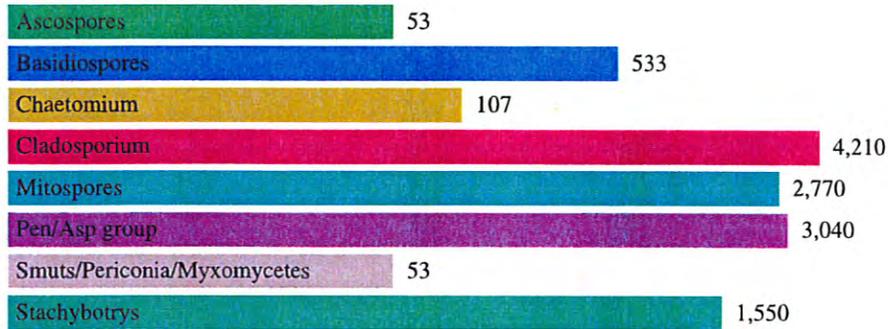




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Spore Trap Samples - Spores per Cubic Meter

Front Space Rear Office





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5 - Sample Identification Definitions

Alternaria

A genus of fungi that is extremely widespread and ubiquitous. It is commonly found in outdoor samples and may be isolated from samples of soil, seeds, and plants. Alternaria is also often found in carpets, textiles, window frames, and on horizontal surfaces in building interiors. It is both a plant pathogen and human pathogen. Alternaria produces large spores, suggesting that the spores from this fungus are deposited in the nose, mouth, and upper respiratory tract. It may be related to baker's asthma. Alternaria has been associated with hypersensitivity pneumonitis, sinusitis, dermatomycosis, onychomycosis, subcutaneous phaeohyphomycosis, and invasive infection. It is a common cause of extrinsic asthma (immediate-type hypersensitivity: type I).

Found in these Sample Locations: (3) Outside

Ascospores

A large group of spores that are very ubiquitous in nature. They are frequently found in the air after a rain. Most ascospores are plant pathogens; a small portion have been known to cause infection in humans but are identified separately.

Found in these Sample Locations: (2) Gym Entry (3) Outside (4) Front Space Rear Office

Basidiospores

A large group of spores that are very ubiquitous in nature. They are released from mushrooms, shelf fungi, puffballs, and a variety of other macro fungi. Basidiospores may be allergenic to those with seasonal allergies.

Found in these Sample Locations: (1) Front Left (2) Gym Entry (3) Outside (4) Front Space Rear Office

Chaetomium

A type of ascospore commonly isolated from soil. It is found on a variety of substrates including decomposing plant material and wood, dung, straw, and damp or water-damaged cellulose (e.g. paper on drywall). As a moisture-indicator fungi, Chaetomium only grows when the substrate has a current or previous severe moisture problem. There are over 100 documented species of Chaetomium, several of which are reported to be toxigenic; if not speciated, the genus Chaetomium should be assumed to be toxigenic. It has been known to cause systemic, cerebral, cutaneous, subcutaneous, and pulmonary infections, though usually only in the immunocompromised.

Found in these Sample Locations: (4) Front Space Rear Office



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Cladosporium

One of the most commonly identified outdoor fungi. It is often found indoors in numbers less than outdoors. Cladosporium is also found on decaying plants and food, straw, paint, and textiles. It is generally regarded to be allergenic and can be a cause of extrinsic asthma (immediate type hypersensitivity: Type I). Cladosporium has been reported in cases of skin lesions, keratitis, onychomycosis, sinusitis, and pulmonary infections.

Found in these Sample Locations: (1) Front Left (2) Gym Entry (3) Outside (4) Front Space Rear Office

Epicoccum nigrum

Epicoccum nigrum (also known as Epicoccum purpurascens) is the only species in the genus Epicoccum. It is very commonly isolated from plants, air, animals, foodstuffs, and textiles.

Epicoccum nigrum is a known plant pathogen, but is not pathogenic to humans.

Found in these Sample Locations: (3) Outside

Ganoderma

A type of basidiospore from a genus of mushrooms known as shelf mushrooms or bracket fungi, which grow on wood. These spores may be allergenic to those with seasonal allergies.

Found in these Sample Locations: (1) Front Left

Mitospores

A large group of morphologically-similar fungi which includes Alternaria, Stemphylium, Pithomyces, and Ulocladium. If hyphal fragments are not attached to the spores, the specific type of mitospore cannot be differentiated and is classified under this grouping. Because mitospores are large spores, they are more easily deposited in the nose, mouth, and upper respiratory tract, allowing them to be potentially very allergenic. Alternaria, Stemphylium, Pithomyces, and Ulocladium are all commonly found on plants, textiles, paper, and in soil. In building interiors, they are commonly isolated from horizontal surfaces (e.g. window sills, attic rafters). Alternaria is both a plant pathogen and human pathogen and is associated with asthma, hypersensitivity pneumonitis, sinusitis, dermatomycosis, onychomycosis, subcutaneous phaeohyphomycosis, and invasive infection. Stemphylium is not a known human pathogen. Pithomyces is not a known human pathogen, but has been known to cause facial eczema on ruminants (e.g. cattle, goats, sheep). Ulocladium is generally not pathogenic, but has been known to cause cutaneous infections in the immunocompromised.

Found in these Sample Locations: (4) Front Space Rear Office



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Pen/Asp group

The spores of the genera *Penicillium*, *Aspergillus*, *Gliocladium*, and *Trichoderma* are quite similar when viewed under a microscope and are grouped together under the heading Pen/Asp. *Penicillium* species are among the most common fungi found in indoor environments, particularly basements. Certain species may cause infections of the eye, external ear, respiratory system, and urinary tract. Some species of *Aspergillus* are parasitic on insects, plants, and animals including humans. All *Aspergillus* species are allergenic. Various species can cause extrinsic asthma, pulmonary emphysema, opportunistic infections of the ears and eyes, and severe pulmonary infections. Many species of *Penicillium* and *Aspergillus* produce mycotoxins which may be associated with diseases in humans and animals. Several toxins are considered potential human carcinogens. The genus *Gliocladium* has not been reported to cause disease in man or animals. The genus *Trichoderma* has been reported to cause infections in immunocompromised individuals, patients undergoing dialysis, and individuals with chronic kidney failure or chronic lung disease.

Found in these Sample Locations: (1) Front Left (2) Gym Entry (3) Outside (4) Front Space Rear Office

Pollen

Pollen are coarse to fine particles/grains produced by various trees, weeds, and grasses. For individuals with seasonal allergies, pollen is often the causative agent.

Found in these Sample Locations: (3) Outside

Smuts/Periconia/Myxomycetes

A group of plant pathogens with similar morphology. They are commonly found in the outdoor environment in soil and on wood, grasses, cereal crops, and flowering plants. Myxomycete spores are considered to cause Type 1 allergies (hay fever and asthma).

Found in these Sample Locations: (4) Front Space Rear Office

Stachybotrys

A fungus naturally found on decaying plant and tree material. In the indoor environment, it grows on building material with a high cellulose and water content and a low nitrogen content (e.g. wet drywall). There are over 20 documented species of *Stachybotrys*, and at least two are reported to be toxigenic; if not speciated, the genus *Stachybotrys* should be assumed to be toxigenic. Specifically, it can produce the mycotoxin trichothecene (Satratoxin H), which is poisonous upon inhalation. Individuals with chronic exposure to the toxin produced by this fungus reported cold and flu symptoms, sore throats, diarrhea, headaches, fatigue, dermatitis, intermittent local hair loss, and general malaise. The toxin may suppress the immune system,



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affecting the lymphoid tissue and the bone marrow. It is also reported to be a liver and kidney carcinogen. Effects by absorption of the toxin in the human lung are known as pneumomycosis. Areas with relative humidity above 55% are subject to temperature fluctuations and are ideal for toxin production. *Stachybotrys* is rarely found in outdoor samples. It is usually difficult to find in indoor air samples unless it is physically disturbed.

Found in these Sample Locations: (1) Front Left (2) Gym Entry (4) Front Space Rear Office



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6 - Glossary of Terms

Agar ~

A gelatinous medium used for growing microorganisms (e.g. mold, yeast, and bacteria).

Ascospore ~

A sexually produced fungal spore formed within an ascus (sac). Most types are associated with plant fungi, and generally have little relevance to human health problems.

Basidiospore ~

A sexually produced fungal spore produced within the group of fungi known as Basidiomycetes. These spores are produced externally on a structure called a basidium, which is common among mushrooms. Some types can be allergenic to humans.

Colony ~

A group of hyphae (filaments) of the same type of microorganism growing together. A colony can be seen with the naked eye.

Colony Forming Unit (CFU) ~

A unit of measure describing the number of colonies present in or on a surface of a sample.

Detection Limit ~

Detection Limit is the smallest amount or concentration of a particular substance / particle that can be reliably detected in a given type of sample or medium by a specific measurement process.

Fungus (fungi, pl) ~

Fungi are a form of life (eukaryotic) which can range from unicellular to filamentous. Fungi lack chlorophyll and absorb nutrients. Fungi can reproduce by sexual, asexual, or both means. Mold is a type of fungi.

Hypha (hyphae, pl) / hyphal fragment ~

Hypha is the tubular filament which is the vegetative, nutrient absorbing portion of the fungus.

Minimum Reporting Limit (MRL) ~

MRL is the smallest measured concentration of an analyte that can be reliably reported by using a given analytical method. MRL is the "less-than" value reported when an analyte is not detected or is detected at a concentration less than the MRL. MRL is dependent on the time and volume of sampling.



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Mitospore ~

Spore types falling within either the deuteromyces or Fungi Imperfecti.

Mold ~

A very large group of microscopic fungi. Most are filamentous organisms and produce spores that can be air-, water-, or insect-borne. Mold can be a common trigger for allergies. For people who are sensitive to mold, exposure can cause symptoms such as nasal stuffiness, eye irritation, or wheezing. People with serious allergies to mold may have more severe reactions. Severe reactions may occur among workers exposed to large amounts of molds in occupational settings. People with chronic illnesses, such as obstructive lung disease, may develop mold infections in their lungs. Mold growth in the home can be slowed by keeping humidity levels below 50% and ventilating showers and cooking areas.

Mycology ~

Mycology is a general term for the study of fungi.

Mycotoxin ~

A substance produced by fungi which can be toxic to man and/or animals.

Mycelium ~

A mass of hyphae.

Negative for Stachybotrys ~

When IMS Laboratory is requested to only look for Stachybotrys in a sample and no Stachybotrys is detected during analysis of that sample, IMS Laboratory reports the results as "Negative for Stachybotrys."

Opaque particle ~

Opaque particles are dark, non-biological, debris through which light will not pass.

Petri Dish ~

A dish containing agar for the culturing of microorganisms (e.g. fungi or bacteria).

Potato Dextrose Agar (PDA) ~

PDA is a solid growth medium consisting of extract of potato and dextrose (sugar). PDA is used to culture commonly occurring fungi.

Pollen ~

Pollen are coarse to fine particles produced by plants (can be allergenic).



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Raw Count ~

The number of particles counted by an analyst during the examination of specimen.

Sample Medium ~

The sample medium refers to the type of test conducted (e.g. swab, spore trap air test, tape lift, etc.).

Sample Rate ~

The sample rate refers to the quantity of a sample collected for laboratory analysis. With reference to air tests, the sample rate is determined by multiplying the flow rate of the collection device by the time the device was operating. With reference to swab samples, the sample rate is the total area swabbed.

Serial Number ~

A manufacturer's specific identification code on a test medium (e.g. spore trap or tape lift).

Spore ~

A propagule/structure produced by fungi as a means of reproduction, survival, and dissemination. Spores can be single cellular or multicellular.

Spore Trap ~

A Spore trap is a collection device (or media) used to capture airborne spores and other airborne particulates. Spore traps are analyzed by microscopic means and do not distinguish between viable and non-viable cells.

Too Numerous To Count (TNTC) ~

TNTC is used to denote specimens in which a type of organism is present at an extremely high level or has grown together so that individual colonies cannot be distinguished.

Total Spore Count ~

The total spore count is the sum total of all spore types found in a laboratory sample.

Toxigenic fungi ~

Toxigenic fungi are fungi capable of producing toxic substances.

Yeast ~

Yeast are a group of single celled fungi.



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7 - Texts and Electronic References

1. De Hoog, G. S., J. Guarro, J. Gene, & M. J. Figueras. *Atlas of Clinical Fungi 2nd*. Centraalbureau voor Schimmel cultures, 2000.
2. Finegold, Sydney M. and Ellen Jo Baron. *Baily and Scott's Diagnostic Microbiology 7th edition*. C. V. Mosby Co.; St. Louis, MO 1986
3. Ellis, M.B. *Dematiaceous Hyphomyces*. CABI Publishing; Cambridge, MA. 1971.
4. Ellis, M.B. *More Dematiaceous Hyphomyces*. CABI Publishing; Cambridge, MA. 2001.
5. Helbling, A., G. Federica, and K.A. Brander. Respiratory allergy to mushroom spores: not well recognized, but relevant. *Ann. Allergy, Asthma, and Immunology*. 1999, Vol 83, no. 1, pp. 178-19.
6. Hurst, Christon J. et al. *Manual of Environmental Microbiology 2nd edition*. ASM Press; Washington, D.C. 2002.
7. *Indoor Air Quality: Identification of Fungal Spores and House Dust*. McCrone Research Institute. Chicago, IL 2003.
8. Kendrick, Bryce. *The Fifth Kingdom 2nd edition*. Focus Texts, Newburyport, MA 1992.
9. Klich, Maren. *Identification of Common Aspergillus Species*. Centraalbureau v. Schimmelcultures, Utrecht, the Netherlands. 2002.
10. Koneman EW et al. *Color atlas & Textbook of Diagnostic Microbiology 4th edition*. JB Lippincott Co.; Philadelphia, PA 1992
11. Larone, Davise H. *Medically Important Fungi a Guide to Identification 4th edition*. ASM Press; Washington, D.C. 2002.
12. Lstiburek, Joseph & John Carmody. *Moisture Control Handbook*. John Wiley & Sons Inc. June 1996.
13. Marta, E., MD and Kathleen S. Kern PhD. *Medical Mycology: A self Instructional Text 2nd edition*. FA Davis Co. 1997.
14. Macher, Janet et al. *Bioaerosols: Assessment and Control*. ACGIH; Cincinnati, OH.



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15. May, Jeffery C. *My House is Killing Me*. The Johns Hopkins Univ. Press, Baltimore, MD 2001.

16. *Mold Remediation in Schools and Commercial Buildings*. United States Environmental Protection Agency. EPA 402-K-01-001. March 2001.

17. Pitt, John L. *A Laboratory Guide to Common Penicillium Spores-3rd Edition*. Food Science Australia, CSIRO, Australia 2000.

18. Smith, E. Grant. *Sampling and Identifying Allergenic Pollens and Molds An Illustrated Identification Manual for Air Samples*. Blewstone Press, San Antonio, TX. 1990.

19. Sugar, Alan M. and Caron A. Lyman. *A Practical Guide to Medically Important Fungi and Diseases They Cause*. Lippincott Raven Publishers; Philadelphia, PA 1997.

20. Ulloa, Miguel and Richard T. Hanlin. *Illustrated Dictionary of Mycology*. Amer. Phytopathological Society; 2000.



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8 - Warranties, Legal Disclaimers, and Limitations

IMS's scope of accreditation through the AIHA is for the following FoT(s)/Method(s): Fungal Air - Culturable (SOP 2.4 Cultured Air Sample Reporting); Fungal Bulk - Culturable (SOP 2.5); Fungal Surface - Culturable (SOP 2.5); Fungal Air - Direct Examination (SOP 2.2 and 2.3); Fungal Bulk - Direct Examination (SOP 2.6); and Fungal Surface - Direct Examination (SOP 2.1).

The study and understanding of molds is a progressing science. Because different methods of sampling, collection and analysis exist within the indoor air quality industry, different inspectors or analysts may not always agree on the mold concentrations present in a given environment. Additionally, the airborne levels of mold change frequently and by large amounts due to many factors including activity levels, weather, air exchange rates (indoors), and disturbance of growth sites. It is possible for report interpretations and ranges of accuracy to vary since comprehensive, generally accepted industry standards do not currently exist for indoor air quality inspections of mold in residential indoor environments. This report is intended to provide an analysis based upon samples taken at the site at the time of the inspection. Mold levels can and do change rapidly, especially if home building materials or contents remain wet for more than 24 hours, or if they are wet frequently. This report is not intended to provide medical or healthcare advice. All allergy or medical-related questions and concerns, including health concerns relating to possible mold exposure, should be directed to a qualified physician. If this report indicates indoor mold levels that are higher than in typical indoor living spaces relative to the outdoor environment, or indicates any findings that are of concern to you, further evaluation by a trained mold professional or a Certified Industrial Hygienist (CIH) may be advisable.

Results pertain only to the items tested. Unless otherwise noted in the body of this report, the condition of samples upon receipt was acceptable. Blank samples are reported in the same manner as all other samples. The results are not corrected for contamination.

This report is generated by IMS at the request of, and for the exclusive use of, the IMS client named on this report. The analysis of the test samples is performed by IMS. This report applies only to the samples taken at the time, place and location referenced in the report and received by IMS, and to the property and weather conditions existing at that time only. Please be aware, however, that property conditions, inspection findings and laboratory results can and do change over time relative to the original sampling due to changing conditions, the normal fluctuation of airborne mold, and many other factors. IMS does not furnish, and has no responsibility for, the inspector or inspection service that performs the inspection or collects the test samples. It is the responsibility of the end-user of this report to select a properly trained professional to conduct the inspection and collect appropriate samples for analysis and interpretation. Neither IMS, nor its



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- End of Lab Report Number E67427 -



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Interpreting Laboratory Results

The following can be used as a guide to better understand the laboratory results:

Viable Air Samples¹:

Low	< 100 CFU/m ³
Low Moderate	100 – 250 CFU/m ³
Moderate	250 – 1000 CFU/m ³
High	> 1000 CFU/m ³
TNTC	Too Numerous To Count

Viable Topical Samples²:

Low	≤ 5 CFU/square inch
Low Moderate	6-25 CFU/square inch
Moderate	26-100 CFU/square inch
High	> 100 CFU/square inch
TNTC	Too Numerous To Count

Non-Viable Air Samples³:

Low	≤ 2000 Total Spore Count/m ³
Low Moderate	2000-5000 Total Spore Count/m ³
Moderate	5001-10,000 Total Spore Count/m ³
High	> 10,000 Total Spore Count/m ³
TNTC	Too Numerous To Count

Non-Viable Topical Samples⁴:

Low	organism is present on less than 5% of sample area.
Moderate	organism is present on 5 to 50% of sample area.
High	organism is present on 51 to 100% of sample area.

Many fungi (e.g. species of *Aspergillus sp*, *Penicillium sp*, *Fusarium sp*, *Trichoderma sp*, and *Memnoniella sp*) in addition to *Stachybotrys* can produce potent mycotoxins. Mycotoxins are fungal metabolites that have been identified as toxic agents. Even low levels of these species should be remediated. For example, the original New York City Department of Health Bureau of Environmental & Occupational Disease Epidemiology *Guidelines on Assessment and Remediation of Stachybotrys Atra in Indoor Environments* recommended remediation if concentrations of *Stachybotrys* in the indoor air exceed concentrations in the outdoor air. If 103 - 104 CFU/m³ of *Stachybotrys* were found in the indoor air, the guidelines recommended immediate evacuation.⁵ These Guidelines were later expanded to include all fungi and reference to specific numerical standards for remediation and evacuation were omitted.

There are currently no state or federal standards or guidelines regarding results of fungal samples. There are no levels, which are typical or permissible. There are no recommended exposure limits, no permissible exposure limits, no threshold limit values and no short term exposure limits.

These guidelines are based on historical analysis and experience and should not be used for health evaluation purposes.

¹ In *Indoor Air Quality in Office Buildings: A Technical Guide, Health Canada, 1993* (Pages 48-49), Health Canada set forth the following guidelines for interpreting viable air testing:

- Significant numbers of certain pathogenic fungi should not be present in indoor air (e.g. *Aspergillus fumigatus*, *Histoplasma*, and *Cryptococcus*). Bird or bat droppings in air intakes, ducts or rooms should be assumed to contain these pathogens.
- The persistent presence of significant numbers of toxigenic fungi (e.g. *Stachybotrys atra*, toxigenic *Aspergillus*, *Penicillium* and *Fusarium* species) indicate that further investigation and action should be taken.
- The confirmed presence of one or more fungal species occurring as a significant percentage of a sample in indoor air samples and not similarly present in concurrent outdoor samples is evidence of a fungal amplifier.
- The “normal” air mycoflora is qualitatively similar and quantitatively lower than that of outdoor air. In federal government buildings, the 3-year average has been approximately 40 CFU/ m³ for *Cladosporium*, *Alternaria*, and non-sporulating basidiomycetes. More than 50 CFU/ m³ may be reason for concern if there is only one species other than *Cladosporium* or *Alternaria* present.
- Up to 150 CFU/m³ is acceptable if there is a mixture of species reflective of the outdoor air. Higher counts suggest dirty air filters or other problems.
- Up to 500 CFU/m³ is acceptable in summer if the species present are primarily *Cladosporium* or other tree and leaf fungi. Higher counts may indicate failure of the filters or contamination in the building.
- The significant presence of fungi in humidifiers and diffuser ducts and on moldy ceiling tiles and other surfaces requires investigation and remedial action regardless of the airborne mold concentrations.
- There are certain kinds of fungi contamination not readily detectable through viable air sampling. If unexplained sick building syndrome symptoms persist, consideration should be given to collecting dust samples and having them analyzed for fungal species.

² Viable Surface Sampling should primarily be used to identify the types and relative proportions of living mold which is visible on a surface. Viable surface sampling should be used to confirm that a substance is mold and to identify the types of mold on the substance. Viable surface sampling should not be performed if no signs of mold growth are observed on the surface. Because mold is everywhere, there is a high probability that a surface sample from a “clean” surface will still identify mold on that surface.

³ The following additional information should be considered when interpreting Nonviable Air Test results:

- When indoor fungal profiles are different from outdoor fungal profiles, indoor sources are indicated.
- Concentrations of common fungi between 500 and 1000 spores/m³ in the indoor air start to be of concern when the organisms are not found in the outdoor air samples. These concentrations are of greater concern when one dominant species is present as opposed to low concentrations of mixed fungi.
- Indoor colonization may be indicated when species are present throughout the indoor environment and not found in the outdoor samples.
- Pathogenic and toxigenic fungi, such as *Fusarium*, *Trichoderma*, *Memnoniella* and *Stachybotrys* are undesirable in indoor environments (even at low concentrations). Many of these molds may produce mycotoxins.

⁴ Nonviable Surface Sampling should primarily be used to identify the types and relative proportions of mold which is visible on a surface. Nonviable surface sampling should be used to confirm that a substance is mold and to identify the types of mold on the substance. Nonviable surface sampling should not be performed if no signs of mold growth are observed on the surface. Because mold is everywhere, there is a high probability that a surface sample from a “clean” surface will still identify mold on that surface.

⁵ The *Guidelines on Assessment and Remediation of Stachybotrys Atra in Indoor Environments* were written specifically for dealing with *Stachybotrys atra*, but used the term “mold” when discussing evacuation criteria based on air monitoring and the need for remediation. IMS Laboratory believes that the author was referring specifically to *Stachybotrys atra* and not to all types of mold. The exact language used was as follows:

1. Concentrations of mold in indoor air which exceed concentrations in outdoor air should be considered positive. Remediation of surfaces and general cleaning is required, as described in Section III.
2. Airborne concentrations of 103-104 cfu/m³ or greater require immediate evacuation of all occupants.

(New York City Department of Health Bureau of Environmental & Occupational Disease Epidemiology *Guidelines on Assessment and Remediation of Stachybotrys Atra in Indoor Environments*, June 1999 (Page 5))



MOLD MATTERS, INC
PROFESSIONAL MOLD REMEDIATION

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 TRAVERSE CITY, MICHIGAN 49686
 Office Phone: (231) 933-6653
 Cell Phone: (231) 313-0440
 Fax: (231) 933-6653
 MOLDMATTERS@SBCGLOBAL.NET
CERTIFIED PROFESSIONALS
WWW.MOLDMATTERS.ORG

ORDER DATE 10/22/2014

CUSTOMER NO. CN 247

<p>COMPANY NAME: CITY OF TRAVERSE CITY CLIENT NAME: JERED OTTENWESS ADDRESS: 517 WELLINGTON ST ADDRESS: TRAVERSE CITY MICHIGAN 49686- PHONE: (231) 922-4440 ESTIMATE DATE: 10/13/2014 ESTIMATE NO: 370 P.O. NUMBER: PREPARED FOR: JERED OTTENWESS ADDRESS: 517 WELLINGTON ST CITY, ST & ZIP: TRAVERSE CITY, MICHIGAN 49686</p>	<p style="text-align: center;">CUSTOMER MESSAGE</p> <p>THANK YOU FOR YOUR BUSINESS. PLEASE TAKE SOME TIME AND REVIEW THIS INFORMATION CAREFULLY. IF YOU HAVE ANY QUESTIONS PLEASE CALL.</p>
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PRODUCT / SERVICE	QUANTITY UNITS	UNIT PRICE	DESCRIPTION	ETAX	STAX	TAX TOTALS	LINE TOTAL
Project							
Air Scrubber	14 Day	\$180.00	Airborne Mold/Particle Removal Machine.	0	0	\$0.00	\$2,520.00
			NOTES: SET UP/ FILTERS, LARGE UNIT X'S 2				
HEPA	7 Day	\$75.00	HEPA Vacuum (# units @ # days)	0	0	\$0.00	\$525.00
			NOTES: TWO MACHINES				
PPE	40 EA (s)	\$48.88	Full Body Suits, Gloves, And Eye Protection (per man)	0	0	\$0.00	\$1,955.00
			NOTES: TWO EACH PER DAY				
DUMP	5 EA (s)	\$635.00	Disposal Fee (Minimum)	0	0	\$0.00	\$3,175.00
			NOTES: 30 YRD ESTIMATED				
DECON	4 EA (s)	\$86.05	Equipment Decontamination	0	0	\$0.00	\$344.22
			NOTES:				
DCON	1 EA (s)	\$166.75	Decontamination Chamber	0	0	\$0.00	\$166.75
			NOTES:				
Containment	6 EA (s)	\$75.00	Critical Barrier	0	0	\$0.00	\$450.00
			NOTES:				
Clearance Test	6 EA (s)	\$100.00	Samples taken to insure project has been properly remediated with a clearance certificate issued.	0	0	\$0.00	\$600.00
			NOTES:				
Miscellaneous Supplies	1 EA (s)	\$1,500.00	Job Related Materials	0	0	\$0.00	\$1,500.00

PROPOSAL

ORDER DATE 10/22/2014

CUSTOMER NO. CN 247

NOTES: HI LO, TAPE, ETC

Wet Fogging	4 EA (s)	\$250.00	Anti-microbial misting	0	0	\$0.00	\$1,000.00
NOTES:							
SS System Special	20 GALLONS	\$52.00	Mold Killing Product 18% Peroxide- 3%Acidic.	0	0	\$0.00	\$1,040.00
NOTES:							
Shock Wave	75 GALLONS	\$26.75	Anti-Microbial Disinfectant	0	0	\$0.00	\$2,006.25
NOTES:							
Mold Remediation Labor	120 Hours	\$55.00	Total Remediation Labor	0	0	\$0.00	\$6,600.00
NOTES: PROJECT MGR							
Mold Remediation Labor	120 Hours	\$35.00	Total Remediation Labor	0	0	\$0.00	\$4,200.00
NOTES: SKILLED							
Mold Remediation Labor	120 Hours	\$35.00	Total Remediation Labor	0	0	\$0.00	\$4,200.00
NOTES: SKILLED							
Mold Remediation Labor	80 Hours	\$25.00	Total Remediation Labor	0	0	\$0.00	\$2,000.00
NOTES: UNSKILLED							
Mold Remediation Labor	80 Hours	\$25.00	Total Remediation Labor	0	0	\$0.00	\$2,000.00
NOTES: UNSKILLED							
Content Manipulation	1 EA (s)	\$1,000.00	Moving Things, Etc.	0	0	\$0.00	\$1,000.00
NOTES: TREAT WIPE DOWN AND MOVE							

PRE-TAX SUBTOTAL	\$35,282.22	ORDER TOTAL	\$35,282.22
TOTAL TAXES	\$0.00	TOTAL PAYMENTS	
		TOTAL DUE	\$35,282.22

Proposal Introduction

Hi Jered,

Here is the estimate to remediate the building correctly. Because of the severity of mold most of the structure will have to be removed and disposed of properly. The utmost in protection is required for our men because of the seriousness of the fungal growth. As with any mold remediation more could be revealed as we move further in this project, if this is the case I will be in direct communications with you so no questions are left untold. This is an estimate and if we do not use quite as much the invoice will reflect this. Please review and keep in touch.

Sincerely,

PROPOSAL

George Jorkasky/ President, Mold Matters Inc.

Remediation Protocol

STEP #1: INSPECTION

* To determine whether the property has a mold problem requiring remediation, Mold Matters, uses a wide variety of mold testing techniques and technologies. The air is sampled via a Bioaerosol Sampler and topical samples are taken through the use of swabs and or lift tapes. This process enables Mold Matter to define the areas of removal and provide oversight for the project.

* Consult with the construction and remodeling group prior to removal to facilitate efficient reconstruction of the space.

* Develop a project time line and communicate this with building representatives prior to the remediation and construction project. Provide contact numbers if occupants have questions about the project.

STEP #2: PERSONNEL

* Individuals trained in the handling of hazardous materials.

* Provide right-to-know training on exposure to the chemicals used and the health effects of exposure to the fungal organisms.

STEP #3: PPE

* Full faced negative pressure respirators (North 7600 series) with CD/CL/HC/HF/OV/SD/P100 cartridges. The cartridge protects against chlorine dioxide, chlorine, hydrogen chloride, hydrogen fluoride, organic vapor, sulfur dioxide and provides a HEPA filter to protect against particles.

* Disposable type coveralls covering both the head and the shoes.

* Gloves: Neoprene, Rubber, Leather or cotton depending on the material to be removed. Leather is recommended when sharp material is expected to be encountered during the demolition.

* Tools: Pliers or cutters to break up metal mesh in plaster walls. These and other tools are used to reduce skin contact with sharp objects.

STEP #4: HYGIENE

* Wash hands after exiting the enclosure and prior to using the hands to place anything in the mouth. Fungal organisms can cause dermatitis. Ingestion of the bacteria or fungi can cause severe diarrhea.

* During the exit from the enclosure, remove the coveralls leaving them inside either the enclosure or the first stage (dirty room) of the two stage decontamination room. In some cases, space will not

allow for construction of the decontamination room.

* In the change area, take off the respirator. Remove the cartridges. Clean the surfaces of the cartridges with a disinfectant wipe and keep the cartridges for reuse. Soak and clean the respirator in a gallon of disinfectant (1/2 oz. A-33 quaternary ammonia disinfectant per gallon of water). Rinse the respirator in water, clean with a disinfectant wipe and dry with a clean towel.

* After an exhaust fan with a HEPA filter is used on a job site, the prefilter is covered with 4-6 mil poly and sealed with duct tape.

STEP #5: CONTAINMENT OF AFFECTED AREA

* Complete isolation of work area from occupied spaces using plastic (4-6 mil poly) sheeting sealed with duct tape (including ventilation ducts/grills, fixtures and other openings).

* Use an exhaust fan with a HEPA filter to generate negative pressurization. Use the appropriate sized unit for the space. For example, an Ulti Vac may be used for a glove bag removal, a HEPA Jr. for an office sized room and larger units for bigger areas. Do not use the same units for asbestos and mold removal. If units are shared, a break in the HEPA filter could change a mold containment into an asbestos containment.

* The two sections of the Ulti Vac's are reinforced with duct tape wrapped around the taped junction in the middle of the vacuum unit.

* If space allows, construct a two stage decontamination room with a changing area and a dirty room attached to the entrance of the containment area.

STEP #6: CONTROL OF EXPOSURE TO ADJACENT AREAS

* Vacating people from spaces is not necessary but is recommended for individuals with reduced immune systems, infants, recent surgery patients, people with chronic inflammatory lung diseases or individuals with respiratory health concerns (asthma, hypersensitivity pneumonitis and severe allergies).

* In general, there are fewer occupant complaints about the remediation if the adjacent spaces are vacated. The complaints about construction related odors are reduced and there is more space to place cleanup material.

STEP #7: PAINTING AND APPLYING BENZALKONIUM CHLORIDE

* Exhaust fan discharge is outside building - Keep HEPA exhaust fan on during the application of Benzalkonium Chloride and anti-microbial paint. Make sure adjacent outside windows are shut, the discharge is not close to an air intake, and window air conditions are shut off or set on re-circulation.

* Exhaust fan discharge is inside building - Shut off HEPA exhaust fan during the application of Benzalkonium Chloride and anti-microbial paint. Turn the fan back on when the odor is no longer noticeable.

* Applying Benzalkonium Chloride to visible fungal growth prior to removal of material. Apply the Benzalkonium Chloride solution to the surface and wait sixty minutes prior to removing the material. This provides sufficient time for the Benzalkonium Chloride to disinfect the material and reduces the dust generated because the material is wetted.

* In some cases, a surface is lightly misted with a Benzalkonium Chloride solution prior to painting. Painting of the surface may begin within 90 minutes of the Benzalkonium Chloride misting.

STEP #8: REMOVAL OF CONTAINMENT MATERIALS

* Containment materials that cannot be cleaned should be removed from the building in sealed plastic bags. The outside of the bags could be cleaned with a damp cloth and a detergent solution or HELP vacuumed in the decontamination chamber prior to their transport to uncontaminated areas of the building. There are no special requirements for the disposal of moldy materials. Moldy materials that are bagged can be disposed of with other general waste.

* Dirt, debris and broken plaster may be placed in 55 gallon drums inside the containment area. Before removal from the containment area, close the drum and clean the outside surface.

STEP #9: CLEANING OF THE CONTAINMENT AREA

* The contained area and decontamination room should be HEPA vacuumed and cleaned with a damp cloth and/or mop with a detergent solution and be visibly clean prior to the removal of isolation barriers.

STEP #10: CONTAINMENT OF AREA USED DURING RECONSTRUCTION

* After the containment area has been cleaned, the enclosure can be used to contain the dusts generated by the sheetrock sanding and taping activities. This is done to reduce the problems with cleanup when reconstruction is completed. The use of HEPA exhaust filter is not required. The two stage decontamination area is also not needed.

STEP #11: FINAL INSPECTION

* Prior to re-occupancy of the space, a visual inspection and or air sampling will be done by Mold Matters or a designated representative. Re-occupancy may occur when the space passes the inspection.

STEP #12" REFERENCES

Guidelines on Assessment and Remediation of Fungi in Indoor Environments, New York City Department of Health Bureau of Environment & Occupational Disease Epidemiology. April, 2000 16p.

Managing Water Infiltration in Buildings, U of MN DEHS and Institute for Environmental Assessment. N.G. Carlson and A. Quraishi - 1998.

Additional procedures developed in consultation with this inspector.

Biocide Application

1. All areas to be treated with a biocide must be clean.
2. Vacuum all debris with an appropriate commercial 5 filter hepa-vac.
3. Using a wire brush or other tools specific to cleaning, aggressively scrub all areas to be treated with a solution containing one part water, one part sodium hypo chloride and 2 ounces of anionic surfactant. Let dry completely.
4. Using a sprayer, thoroughly saturate the entire area with the pre-mixed biocide, (Remedia One, Serum 1000, Fiberlock Shockwave, Rapid Mold Remover and or other various Fungicide Cleaners). Let dry completely.
5. Repeat step number four.
6. Spray or brush on an antimicrobial sealant if applicable, (Harmony, Zinsser, Fosters or other various products). Complete coverage is essential.
7. Perform clearance tests, optional (Recommended) additional charge.