



The Identification Specialists

Analysis Report
prepared for
Lakeshore Restoration, LLC

Report Date: 3/5/2024

Project Name: Mike Bruckschen

Project #: 1350 W Washington Av

SanAir ID#: 24012471



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SanAir ID Number
24012471
FINAL REPORT
3/5/2024 11:39:50 AM

Name: Lakeshore Restoration, LLC
Address: 1620 22nd St
Two Rivers, WI 54241
Phone: 9202211440

Project Number: 1350 W Washington Av
P.O. Number:
Project Name: Mike Bruckschen
Collected Date: 2/29/2024
Received Date: 3/1/2024 10:20:00 AM

Dear Rigoberto Lopez,

We at SanAir would like to thank you for the work you recently submitted. The 1 sample(s) were received on Friday, March 01, 2024 via UPS. The final report(s) is enclosed for the following sample(s): 37443064.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

A handwritten signature in black ink that reads "L. Claire Macdonald". The signature is written in a cursive, flowing style.

L. Claire Macdonald
Microbiology Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:

- Cover Letter
- Air Cassette Analysis
- Disclaimers and Additional Information

Sample conditions:

- 1 samples in Good condition.



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Analyst: Tucker, Crystal

Air Cassette Analysis

ND = None Detected. Blank spaces indicate no spores detected.

| SanAir ID Number | 24012471-001 | | |
|-------------------------|---------------------------|----------------------|-----|
| Analysis Using STL | 105C | | |
| Sample Number | 37443064 | | |
| Sample Identification | Basement | | |
| Sample Type | Air Cassette - Air-O-Cell | | |
| Volume | 150 Liters | | |
| Analytical Sensitivity | 7 Count/M ³ | | |
| Background Density | 2+ | | |
| Other | Raw Count | Count/M ³ | % |
| Mycelial Fragments | 1 | 7 | n/a |
| Fungal Identification | Raw Count | Count/M ³ | % |
| Aspergillus/Penicillium | 1 | 7 | 13 |
| Basidiospores | 5 | 33 | 62 |
| Cladosporium species | 2 | 13 | 25 |
| TOTAL | 8 | 53 | |

Signature:

Crystal Tucker

Date: 3/5/2024

Reviewed:

Anna Zuckerman

Date: 3/5/2024



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Organism Descriptions

The descriptions of the organisms presented are derived from various reference materials. The laboratory report is based on the data derived from the samples submitted and no interpretation of the data, as to potential, or actual, health effects resulting from exposure to the numbers of organisms found, can be made by laboratory personnel. Any interpretation of the potential health effects of the presence of this organism must be made by qualified professional personnel with first hand knowledge of the sample site, and the problems associated with that site.

Mycelial Fragments - A mycelium (plural = mycelia) is the "body" of a fungus. It is a collective term for hyphae (singular = hypha), which are the tubular units of the mycelium usually composed of chitin. The terms hyphae and mycelial fragments are used interchangeably. [This information was referenced from the mycology text "The Fifth Kingdom"] In some cases a fungal identification cannot be obtained due to lack of sporulation. Only the mycelial fragments are present, and cannot be identified without the distinguishing characteristics of the spores or the structures they grow from.

Health Effects: Allergic reactions may occur in the presence of spores (conidia) or mycelial/hyphal fragments.

Aspergillus/Penicillium - These spores are easily aerosolized. Only through the visualization of reproductive structures can the genera be distinguished. Also included in this group may be spores of the genera Acremonium, Phialophora, Verticillium, Paecilomyces, Talaromyces etc. Small, round to ovoid spores of this group lack the necessary distinguishing characteristics when seen on non-viable examination.

Health Effects: Can cause a variety of symptoms including allergic reactions. Most symptoms occur if the individual is immunocompromised in some way (HIV, cancer, etc).

Basidiospores - From the Subphylum Basidiomycotina which contains the mushrooms, shelf fungi, and a variety of other macrofungi. They are saprophytes, ectomycorrhizal fungi or agents of wood rot, which may destroy the structure wood of buildings. It is extremely difficult to identify a specific genera of mushrooms by using standard culture plate techniques. Some basidiomycete spores can be identified by spore morphology; however, some care should be exercised with regard to specific identification. The release of basidiospores is dependant upon moisture, and they are dispersed by wind.

Health Effects: Many have the potential to produce a variety of toxins. Members of this group may trigger Type I and III fungal hypersensitivity reactions. Rarely reported as opportunistic pathogens.

Cladosporium species - The most commonly identified outdoor fungus. The outdoor numbers are reduced in the winter and are often high in the summer. Often found indoors in numbers less than outdoor numbers. It is commonly found on the surface of fiberglass duct liner in the interior of supply ducts. A wide variety of plants are food sources for this fungus. It is found on dead plants, woody plants, food, straw, soil, paint and textiles. Often found in dirty refrigerators and especially in reservoirs where condensation is collected, on moist window frames it can easily be seen covering the whole painted area with a velvety olive green layer.

Health Effects: It is a common allergen. It can cause mycosis. Common cause of extrinsic asthma. Acute symptoms include edema and bronchospasms, chronic cases may develop pulmonary emphysema. Illnesses caused by this genus can include phaeohyphomycosis, chromoblastomycosis, hay fever and common allergies.

References: Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. Microorganisms in Home and Indoor Work Environments. London and NY: Taylor & Francis, 2001. de Hoog, G.S. et al. Atlas of Clinical Fungi. 4th ed. Foundation Atlas of Clinical Fungi. 2020

Additional Information

Air Cassette Analyses

Air cassette reports indicate the genus and concentration of viable (living) and non-viable mold spores detected on the slide (A2 Analysis). Whether or not these spores are viable cannot be determined using this type of analysis. However, keep in mind that spores can remain allergenic even after cellular death. Other possible allergens include dander, pollen and fibers which are included in air cassette reports for the A1 Analysis. A1 and A2 analyses are performed on several types of air cassettes. Light microscopy at a 400 to 1000x magnification is used for air cassette sample analysis. SanAir always analyzes 100% of the impacted slide.

Explanation of Background Densities

The background density of an air cassette aids in the overall interpretation of results as it indicates the level of background debris present (e.g. dander, pollen, fibers, insect parts, soot, fly ash, etc.). Excessive background debris may mask the presence of fungal spores thereby reducing the accuracy of the count. It may also serve as an alert that the volume of air pulled was too high or too low. The following table explains background densities.

| Air Cassette Density | Amount of Particulate on Slide | Explanation |
|-----------------------------|---------------------------------------|---|
| 1 | Insignificant | Should not skew any counts |
| 1+ | Low | Should not skew any counts |
| 2 | Low to Moderate | Should not skew any counts |
| 2+ | Moderate to High | May cause occlusion of small spores |
| 3 | High | May cause occlusion of small to medium spores |
| 3+ | Very High | Will cause occlusion of spores |
| 4 | Overloaded | Level of particulate too high to perform analysis |

A Note About the Fungal Spores

In some instances certain groups of fungi cannot be identified due to a lack of distinguishing characteristics. These fungi will be categorized as non-specified spores on the final report.

The genera *Aspergillus* and *Penicillium* are typically composed of small, round spores that are difficult to distinguish from each other; therefore, they are grouped into the category *Aspergillus / Penicillium*. Other fungi that produce spores of similar characteristics may also be placed into this category, including *Paecilomyces*, *Talaromyces*, and *Trichoderma*, among others.

Stachybotrys and *Memnoniella* spores are coated with a sticky lime-layer that may inhibit aerosolization.

Any genus of fungi detected on an air cassette with a high raw count (i.e. exceeding 500 spores) may be estimated. Any estimate higher than 12,000 spores will be reported as >12,000.

Understanding the Air Cassette Report

Each sample has 3 columns of information provided. The left is the raw count which is the number of spores for that fungal type detected on the trace. The middle column is the count per cubic meter (Count/m³) which is the raw count converted based on the total volume pulled for that sample. It represents the number of spores that should be expected in a cubic meter of air from the location in question *if* the spores were distributed evenly throughout the air. This column is helpful for interpreting results when the samples were pulled at different total volumes. In other words, the raw count of a cassette pulled at 75 liters should not be compared to the raw count of a cassette pulled at 150 liters because there may be higher counts associated with the higher volume. By comparing the Count/m³ columns the difference in volumes are accounted for.

The analytical sensitivity is the lowest spore count detectable with reasonable certainty, and it is calculated this way using a raw count of one. Keep in mind there are 1,000 liters in a cubic meter.

$$1 \times (1,000 / \text{Total Volume in Liters})$$

How to calculate the count per cubic meter:

$$\text{Raw Count} \times (1,000 / \text{Total Volume in Liters})$$

The last column on the right shows the percentage for which each spore type comprised the total spore count.

Understanding the Air Cassette Graph (If included in the final report)

The graph is a visual representation of the baseline sample (usually the outdoor air sample) compared individually against each indoor sample. Each spore type found on the indoor sample is compared to what was found outdoors per cubic meter.

The graph shows the percentile representation of each indoor spore count derived by dividing the indoor Count/m³ by the outdoor Count/m³. If the percentage is below 50% of the outside count, then the bar is below 50 on the chart, which corresponds to %Within 50% of Baseline Count/m³.+ If the percentage is between 50 and 100%, then the bar on the chart will stop between 50 and 100, which corresponds to %Count/m³ comparable to Baseline.+ If the percentage is greater than 100%, then the bar will be above 100 on the chart, which corresponds to %Count/m³ higher than Baseline.+

Each organism is given a threshold level for the Count/m³. If this threshold level is not met in an inside sample, then the organism will not be graphed on the chart. This is used to prevent the graph from showing every spore type that is commonly found outside and doesn't typically indicate a possible moisture problem inside. For example, most common outdoor spores (e.g. ascospores, basidiospores, and *Cladosporium*) have a threshold level of 100. Therefore, in order to show up on the chart, the inside Count/m³ must be above 100. On the other hand, fungi that may indicate water damage (e.g. *Stachybotrys*, *Ulocladium*, *Chaetomium*, *Memnoniella*, etc.) are given lower threshold levels. These fungi have a higher water activity value and therefore require more moisture to grow. *Stachybotrys* and *Chaetomium* have threshold values of 14 and 30, respectively, as even a low count of those types of spores may indicate an issue with excess moisture.

Keep in mind that this graph is to be used only as a tool in the inspection of a building. Visual examination and knowledge of water damage, past remediation, and weather conditions, among other elements, is essential in the decision regarding the indoor air quality of a building.

Assistance with Remediation Projects

more information pertaining to interpretation of results is available on our website www.sanair.com

For assistance in a remediation project you may consult the Institute of Inspection, Cleaning and Restoration Certification (IICRC) S500 and S520 protocols. The S500 is a reference guide for water-damage restoration and the S520 pertains specifically to mold remediation. Other standards and guidelines regarding Indoor Air Quality that may assist in remediation projects:

- AIHA (Recognition, Evaluation, and Control of Indoor Mold)
- AIHA (The Facts About Mold)
- NADCA (ACR 2006)
- IESO (Standards of Practice for the Assessment of Indoor Air Quality)
- EPA (Mold Remediation in Schools and Commercial Buildings)
- New York City Department of Health and Mental Hygiene (Guidelines on Assessment and Remediation of Fungi in Indoor Environments)

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