HAYES MICROBIAL CONSULTING

**#10000001**

Analysis Report prepared for

# Sample Company

**123 Main Street**
**Midlothian, VA. 23112**

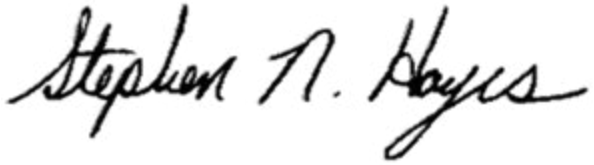
Phone: **(804) 562-3435**

Collected: **May 5, 2019**
Received: **May 6, 2019**
Reported: **May 6, 2019**

We would like to thank you for trusting Hayes Microbial for your analytical needs!
We received 10 samples by FedEx in good condition for this project on May 6th, 2019.

The results in this analysis pertain only to this job, collected on the stated date, and should not be used in the interpretation of any other job. This report may not be duplicated, except in full, without the written consent of Hayes Microbial Consulting, LLC..

This laboratory bears no responsibility for sample collection activities, analytical method limitations, or your use of the test results. Interpretation and use of test results are your responsibility. Any reference to health effects or interpretation of mold levels is strictly the opinion of Hayes Microbial. In no event, shall Hayes Microbial or any of its employees be liable for lost profits or any special, incidental or consequential damages arising out of the use of these test results.



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**John Doe**
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## Spore Trap
SOP - HMC#101

| Sample Number | 1 | 1 | | 2 | 2 | | 3 | 3 | | 4 | 4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | Exterior | | | Basement | | | Family Room | | | Master Bedroom | | |
| Sample Volume | 75.00 liter | | | 75.00 liter | | | 75.00 liter | | | 75.00 liter | | |
| Reporting Limit | 13 | | | 13 | | | 13 | | | 13 | | |
| Background | 1 | | | 3 | | | 2 | | | 2 | | |
| Fragments | 13/m³ | | | 53/m³ | | | 27/m³ | | | 67/m³ | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **Organism** | **Raw Count** | **Count / m³** | **% of Total** | **Raw Count** | **Count / m³** | **% of Total** | **Raw Count** | **Count / m³** | **% of Total** | **Raw Count** | **Count / m³** | **% of Total** |
| Alternaria | 4 | 53 | <1% | | | | | | | 2 | 27 | <1% |
| Ascospores | 420 | 5600 | 51.0 | 74 | 987 | 10.7% | 108 | 1440 | 31.9% | 82 | 1093 | 12.9% |
| Aspergillus\|Penicillium | 63 | 840 | 7.7% | 518 | 6907 | 75.2% | 118 | 1573 | 34.8% | 94 | 1253 | 14.8% |
| Basidiospores | 128 | 1707 | 15.6% | 21 | 280 | 3.0% | 39 | 520 | 11.5% | 19 | 253 | 3.0% |
| Bipolaris\|Drechslera | | | | | | | | | | | | |
| Chaetomium | | | | 13 | 173 | 1.9% | | | | | | |
| Cladosporium | 196 | 2613 | 23.8% | 27 | 360 | 3.9% | 72 | 960 | 21.2% | 438 | 5840 | 68.9% |
| Curvularia | | | | | | | | | | | | |
| Epicoccum | | | | | | | | | | | | |
| Fusarium | | | | | | | | | | | | |
| Memnoniella | | | | | | | | | | | | |
| Myxomycetes | 7 | 93 | <1% | | | | 2 | 27 | <1% | 1 | 13 | <1% |
| Pithomyces | | | | | | | | | | | | |
| Stachybotrys | | | | 36 | 480 | 5.2% | | | | | | |
| Stemphylium | | | | | | | | | | | | |
| Torula | 5 | 67 | <1% | | | | | | | | | |
| Ulocladium | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Total | 823 | 10973 | 100% | 689 | 9187 | 100% | 339 | 4520 | 100% | 636 | 8479 | 100% |

Water Damage Indicator | Common Allergen | Slightly Higher than Baseline | Significantly Higher than Baseline | Ratio Abnormality

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Project Analyst: Ramesh Poluri, PhD — Date: **05 - 06 - 2019**

Reviewed By: Steve Hayes, BSMT — Date: **05 - 06 - 2019**

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## Direct Analysis

SOP - HMC#102

| #1 | Swab (1.00 cm²) | Organism | Spore Estimate | Mycelial Estimate |
|---|---|---|---|---|
| 1 - First Floor Family Room | | Ascospores | Rare | ND |
| | | Aspergillus\|Penicillium | Light | ND |
| | | Bipolaris\|Drechslera | Light | Trace |
| **#2** | **Swab (1.00 cm²)** | **Organism** | **Spore Estimate** | **Mycelial Estimate** |
| 2 - First Floor Kitchen | | No Fungi Detected | | |
| **#3** | **Swab (1.00 cm²)** | **Organism** | **Spore Estimate** | **Mycelial Estimate** |
| 3 - Basement | | Ascospores | Moderate | Trace |
| | | Aspergillus\|Penicillium | Heavy | Few |
| | | Chaetomium | Very Heavy | Many |

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## Particle Analysis

| Sample Number | 1 | 1 | | 2 | 2 | | 3 | 3 | | 4 | 4 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | Exterior | | | Basement | | | Family Room | | | Master Bedroom | | |
| Sample Volume | 75.00 liter | | | 75.00 liter | | | 75.00 liter | | | 75.00 liter | | |
| Reporting Limit | 13 particles/m³ | | | 13 particles/m³ | | | 13 particles/m³ | | | 13 particles/m³ | | |
| **Particle** | **Raw Count** | **Count / m³** | **% of Total** | **Raw Count** | **Count / m³** | **% of Total** | **Raw Count** | **Count / m³** | **% of Total** | **Raw Count** | **Count / m³** | **% of Total** |
| Cellulose Fibers | | | | 6 | 80 | 1.3% | 12 | 160 | 7.7% | 14 | 187 | 8.4% |
| Synthetic Fibers | | | | | | | | | | | | |
| Fiberglass | | | | | | | | | | | | |
| Dander | 6 | 80 | 13.3% | 460 | 6133 | 97.0% | 127 | 1693 | 81.9% | 131 | 1747 | 78.4% |
| Plant Hair | | | | | | | | | | | | |
| Talc | | | | | | | | | | 3 | 40 | 1.8% |
| Char-like Soot | | | | | | | | | | | | |
| Ash-like Soot | | | | | | | | | | | | |
| Aciniform-like Soot | | | | | | | | | | | | |
| Animal Hair | | | | | | | 4 | 53 | 2.6% | | | |
| Human Hair | | | | | | | 2 | 27 | 1.3% | 7 | 93 | 4.2% |
| Wood Fibers | | | | | | | | | | | | |
| Feather Barbule | | | | | | | | | | | | |
| Pollen | 39 | 520 | 86.7% | 3 | 40 | <1% | 10 | 133 | 6.5% | 12 | 160 | 7.2% |
| Gypsum | | | | 5 | 67 | 1.0% | | | | | | |
| Silicates | | | | | | | | | | | | |
| Carpet Beetle Larvae | | | | | | | | | | | | |
| Insect Frass | | | | | | | | | | | | |
| Dust Mite Parts | | | | | | | | | | | | |
| Insect Parts | | | | | | | | | | | | |
| Mineral Salts | | | | | | | | | | | | |
| Opaque Particles | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Total | 45 | 600 | 100% | 474 | 6320 | 100% | 155 | 2067 | 100% | 167 | 2227 | 100% |

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## Organism Descriptions

**Alternaria**

**Habitat:** Commonly found outdoors in soil and decaying plants. Indoors, it is commonly found on window sills and other horizontal surfaces.

**Effects:** A common allergen and has been associated with hypersensitivity pneumonitis. Alternaria is capable of producing toxic metabolites which may be associated with disease in humans or animals. Occasionally an agent of onychomycosis, ulcerated cutaneous infection and chronic sinusitis, principally in the immunocompromised patient.

**Animal Hair**

**Habitat:** Hair from any animal. They are easily distinguished from human hair.

**Effects:** Common sources in homes are cats, dogs, mice, squirrels, raccoons, bats, etc.

**Ascospores**

**Habitat:** A large group consisting of more than 3000 species of fungi. Common plant pathogens and outdoor numbers become very high following rain. Most of the genera are indistinguishable by spore trap analysis and are combined on the report.

**Effects:** Health affects are poorly studied, but many are likely to be allergenic.

**Aspergillus|Penicillium**

**Habitat:** The most common fungi isolated from the environment. Very common in soil and on decaying plant material. Are able to grow well indoors on a wide variety of substrates.

**Effects:** This group contains common allergens and many can cause hypersensitivity pneumonitis. They may cause extrinsic asthma, and many are opportunistic pathogens. Many species produce mycotoxins which may be associated with disease in humans and other animals. Toxin production is dependent on the species, the food source, competition with other organisms, and other environmental conditions.

**Basidiospores**

**Habitat:** A common group of Fungi that includes the mushrooms and bracket fungi. They are saprophytes and plant pathogens. In wet conditions they can cause structural damage to buildings.

**Effects:** Common allergens and are also associated with hypersensitivity pneumonitis.

**Bipolaris|Drechslera**

**Habitat:** They are found in soil and as plant pathogens. Can grow indoors on a variety of substrates.

**Effects:** They may be allergenic and are very commonly involved in allergic fungal sinusitis. They are opportunistic pathogens but occasionally infect healthy individuals, causing keratitis, sinusitis and osteomyelitis.

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## Organism Descriptions

**Cellulose Fibers**

**Habitat:** Cellulose fibers are natural fibers from plant material.

**Effects:** Sources of cellulose fibers are paper, cardboard, insulation material.

**Chaetomium**

**Habitat:** Ascomycete fungus, commonly isolated from soil and decaying plant materials. It is cellulolytic and grows well indoors on damp sheetrock and other paper substrates. It is often found growing with Stachybotrys.

**Effects:** It is reported to be allergenic and may produce toxins.

**Cladosporium**

**Habitat:** One of the most common genera worldwide. Found in soil and plant debris and on the leaf surfaces of living plants. The outdoor numbers are lower in the winter and often relatively high in the summer, especially in high humidity. The outdoor numbers often spike in the late afternoon and evening. Indoors, it can be found growing on textiles, wood, sheetrock, moist window sills and in HVAC supply ducts.

**Effects:** A common allergen, producing more than 10 allergenic antigens and a common cause of hypersensitivity pneumonitis.

**Dander**

**Habitat:** Dander is dead skin cells. The average person sheds about 600,000 skin cells per day.

**Effects:** Sources are people and animals.

**Gypsum**

**Habitat:** Drywall (also known as plasterboard, wallboard, or gypsum board is a panel made of gypsum plaster pressed between two thick sheets of paper.

**Effects:** Drywall

**Human Hair**

**Habitat:** Human hairs or pieces of hair.

**Effects:** Humans

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| | | |
|---|---|---|
| **Myxomycetes** | **Habitat:** | Found on decaying plant material and as a plant pathogen. |
| | **Effects:** | Some allergenic properties reported, but generally pose no health concerns to humans. |
| **Pollen** | **Habitat:** | Reproductive structures of trees, grasses and plants. |
| | **Effects:** | Trees, grasses and plants. |
| **Stachybotrys** | **Habitat:** | Commonly found in soil and on decaying plant material. It is cellulolytic, and can be found indoors on wet materials containing cellulose, such as wallboard, ceiling tile, and other paper-based materials. It is found outdoors on decaying plant material although it is rarely detected on outdoor air samples. |
| | **Effects:** | Allergenic properties are poorly studied and no cases of infection have been reported in humans. They do however produce potent tricothecene mycotoxins. The toxins produced by this fungus can suppress the immune system affecting the lymphoid tissue and the bone marrow. The mycotoxin is also reported to be a liver and kidney carcinogen. |
| **Torula** | **Habitat:** | Found in soil and on wood and grasses. Occasionally found growing indoors on cellulose containing materials. |
| | **Effects:** | A known allergen. No known cases of human infection. |