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**CTEH**<sup>®</sup>

THE SCIENCE OF READY<sup>SM</sup>

# CAPE CORAL TECHNICAL COLLEGE

## POST REMEDIATION ASSESSMENT

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Cape Coral, Florida

October 15, 2022

Project #021343

## Post Remediation Assessment

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Prepared on October 15, 2022

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## 1.0 Background

On September 28, 2022, Hurricane Ian made landfall in Cayo Costa, FL with winds of 155 miles per hour, two miles per hour short of a Category 5 hurricane. Over the course of two days, Ian moved across Florida, exiting on September 30, 2022, but not before causing major flooding and tornado-like damage in areas across the state.

In response to Hurricane Ian, CTEH, LLC® (CTEH) was requested by Lemoine Disaster Recovery (Lemoine) to assess structures associated with Lee County School District awarded to them under RFQ No. 22-7431TA for potential water intrusion. On October 14, 2022, industrial hygienists from CTEH, LLC® (CTEH) and EFI Global, Inc. conducted post remediation verification (PRV) bioaerosol sampling and visually assessed the Cape Coral Technical College at 360 Santa Barbara Blvd N, Cape Coral, FL 33993. All samples were collected under the supervision of a licensed mold assessor from EFI. The assessments were requested by Lemoine to assess the potential presence of airborne mold spores, and were conducted in both the impacted and non-impacted buildings.

Heating, ventilation, and air-conditioning (HVAC) for each room is provided by a HVAC system on the roof of the building.

At this time all rooms are sampled and there were no visible signs of mold in the rooms inspected; however, there were three rooms that contained elevated spore counts associated with Chaetomium and/or Stachybotrys. Those rooms are located at:

- Building 01-1-008
- Building 01-1-207
- Building 01-1-213

The airborne bioaerosol sampling in all other rooms confirmed mold spores were consistent with what would be found outdoors or in a typical building environment.

## 2.0 Exposure Standards and Guidelines

Currently, there are no generally accepted occupational or public health standards for interpreting airborne microbiological sample results. Individual susceptibility varies with genetic predisposition, age, state of health, concurrent exposures, and previous sensitization. Due to these challenges, it is not possible to determine an indoor spore concentration that can guarantee all individuals will be asymptomatic. Guidelines published by the American Industrial Hygiene Association (AIHA) recommend comparing the indoor and outdoor air sampling results. In general, the types of fungi and their airborne concentrations found indoors should be similar (in non-problem buildings) to outdoor air.<sup>[1]</sup> Differences

in the airborne levels or types of fungi may indicate the presence of moisture sources and resultant fungal growth.

### 3.0 Methods and Equipment

All collected samples were sent under chain-of-custody to EMSL Analytical, Inc., an AIHA-accredited laboratory.\* All monitoring equipment was factory calibrated at the manufacturers recommended interval or prior to sampling.

Bioaerosol samples were collected indoors and outdoors using Zefon Air-O-Cell sampling cassettes attached to an SKC QuickTake 30 air sampling pump. Prior to sampling, the pump was calibrated to a flowrate of approximately 15 L/min, as specified by the sampling media manufacturer, using a Bios Defender 510 DryCal. Each sample was collected for a ten-minute duration resulting in a sampled air volume of approximately 150 Liters.† Samples were analyzed by microscopic examination using method EMSL 05-TP-003/ASTM D7391 to determine mold spore genus and spore concentration. This method does not differentiate between viable and non-viable spore types.

#### 3.1 Visual Inspection

A visual inspection was conducted in accessible portions of the classrooms, school common areas, and above drop ceilings as necessary.

#### 3.2 Psychrometric Assessment

A psychrometric assessment was conducted utilizing a Protimeter Hygromaster L (Model #: POL7750L) Hygrometer in both the impacted and non-impacted buildings.

### 4.0 Results

Laboratory reports for all samples are provided in **Appendix A**.

### 5.0 Conclusions and Recommendations

The inspections and tests were performed on October 14, 2022, by industrial hygienists from CTEH and EFI. The results of the post-remediation inspection revealed no visible mold growth but did reveal three rooms that had elevated spore counts for Chaetomium and/or Stachybotrys. Lemoine was notified of these results and advised to investigate the potential source of these detections further, and that isolation of the rooms and additional remediation actions prior to permitting re-occupancy to this school location

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\* AIHA Laboratory Accreditation Program (AIHA-LAP) – Environmental Microbiology; AIHA Environmental Microbiology Proficiency Analytical Testing Program (AIHA-EMPAT) Participant; CDC Elite – Legionella

† See laboratory reports in the appendix for exact flowrates and collected volumes.

may be warranted. The post-remediation inspection also revealed psychrometric (i.e., atmospheric) readings above 55 Grains of Moisture per Pound of Air (GPP), which may also warrant further investigation / dehumidification techniques to inhibit microbial growth.

The results of the air testing in all other assessed rooms are considered normal and typical and do not indicate the presence of elevated airborne mold spores.

While some areas of the Cape Coral Technical College may be fit for re-occupancy at this time, the presence of Chaetomium and/or Stachybotrys may warrant a more thorough investigation, and it is recommended that, at a minimum, the rooms that contained these elevated spore counts are retested following further investigation and remediation activities prior to removing occupancy restrictions.

## 6.0 References

[1] (AIHA), American Industrial Hygiene Association. *Facts About Mold*. Edited by American Industrial Hygiene Association (AIHA). Falls Church, Virginia: AIHA, 2011.

# Appendix A

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## Laboratory Reports



# EMSL Analytical, Inc.

5700 Memorial Highway, Suite 122 Tampa, FL 33615

Tel/Fax: (813) 280-8752 / (813) 280-8753

<http://www.EMSL.com> / [tampalab@emsl.com](mailto:tampalab@emsl.com)

EMSL Order: 932205763

Customer ID: CTEH99

Customer PO:

Project ID:

**Attention:** Noah Ambros  
CTEH Center for Toxicology & Env. Health  
5120 North Shore Drive  
North Little Rock, AR 72118

**Phone:** (501) 454-1622

**Fax:** (501) 614-2835

**Collected Date:** 10/14/2022

**Received Date:** 10/15/2022 06:15 AM

**Analyzed Date:** 10/15/2022

**Project:** 035.18478/ Cape Coral Technical College

### Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

| Lab Sample Number:        | 932205763-0001     |                      |            | 932205763-0002    |                      |            | 932205763-0003     |                      |            |
|---------------------------|--------------------|----------------------|------------|-------------------|----------------------|------------|--------------------|----------------------|------------|
| Client Sample ID:         | CC01               |                      |            | CC02              |                      |            | CC03               |                      |            |
| Volume (L):               | 150                |                      |            | 150               |                      |            | 150                |                      |            |
| Sample Location:          | Building 01-1-079A |                      |            | Building 01-1-008 |                      |            | Building 01-1-011A |                      |            |
| Spore Types               | Raw Count          | Count/M <sup>3</sup> | % of Total | Raw Count         | Count/M <sup>3</sup> | % of Total | Raw Count          | Count/M <sup>3</sup> | % of Total |
| Alternaria (Ulocladium)   | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Ascospores                | 2                  | 40                   | 4.5        | 2                 | 40                   | 6.1        | -                  | -                    | -          |
| Aspergillus/Penicillium   | 15                 | 330                  | 37.2       | 14                | 310                  | 47         | 2                  | 40                   | 23.5       |
| Basidiospores             | 8                  | 200                  | 22.5       | 6                 | 100                  | 15.2       | 3                  | 70                   | 41.2       |
| Bipolaris++               | 1*                 | 7*                   | 0.8        | -                 | -                    | -          | -                  | -                    | -          |
| Chaetomium++              | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Cladosporium              | 9                  | 200                  | 22.5       | 6                 | 100                  | 15.2       | 1                  | 20                   | 11.8       |
| Curvularia                | 4                  | 90                   | 10.1       | 3                 | 70                   | 10.6       | 2                  | 40                   | 23.5       |
| Epicoccum                 | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Fusarium++                | -                  | -                    | -          | 4*                | 30*                  | 4.5        | -                  | -                    | -          |
| Ganoderma                 | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Myxomycetes++             | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Pithomyces++              | 1                  | 20                   | 2.3        | -                 | -                    | -          | -                  | -                    | -          |
| Rust                      | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Scopulariopsis/Microascus | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Stachybotrys/Memnoniella  | -                  | -                    | -          | 2*                | 10*                  | 1.5        | -                  | -                    | -          |
| Unidentifiable Spores     | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Zygomycetes               | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Cercospora++              | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Pyricularia               | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| <b>Total Fungi</b>        | <b>40</b>          | <b>887</b>           | <b>100</b> | <b>37</b>         | <b>660</b>           | <b>100</b> | <b>8</b>           | <b>170</b>           | <b>100</b> |
| Hyphal Fragment           | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Insect Fragment           | -                  | -                    | -          | -                 | -                    | -          | -                  | -                    | -          |
| Pollen                    | 2                  | 40                   | -          | -                 | -                    | -          | 1*                 | 7*                   | -          |
| Analyt. Sensitivity 600x  | -                  | 22                   | -          | -                 | 22                   | -          | -                  | 22                   | -          |
| Analyt. Sensitivity 300x  | -                  | 7*                   | -          | -                 | 7*                   | -          | -                  | 7*                   | -          |
| Skin Fragments (1-4)      | -                  | 1                    | -          | -                 | 1                    | -          | -                  | 1                    | -          |
| Fibrous Particulate (1-4) | -                  | 1                    | -          | -                 | 1                    | -          | -                  | 1                    | -          |
| Background (1-5)          | -                  | 2                    | -          | -                 | 2                    | -          | -                  | 2                    | -          |

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Gerald Iannuzzi, Laboratory Manager  
or other Approved Signatory

No discernable field blank was submitted with this group of samples.

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Samples analyzed by EMSL Analytical, Inc. Tampa, FL A2LA Accredited – Certificate #2845.28

Initial report from: 10/15/2022 11:08 AM

For information on the fungi listed in this report, please visit the Resources section at [www.emsl.com](http://www.emsl.com)





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### Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

| Lab Sample Number:        | 932205763-0004    |                      |            | 932205763-0005    |                      |            | 932205763-0006    |                      |            |
|---------------------------|-------------------|----------------------|------------|-------------------|----------------------|------------|-------------------|----------------------|------------|
| Client Sample ID:         | CC04              |                      |            | CC05              |                      |            | CC06              |                      |            |
| Volume (L):               | 150               |                      |            | 150               |                      |            | 150               |                      |            |
| Sample Location:          | Building 01-1-022 |                      |            | Building 01-1-047 |                      |            | Building 01-1-207 |                      |            |
| Spore Types               | Raw Count         | Count/M <sup>3</sup> | % of Total | Raw Count         | Count/M <sup>3</sup> | % of Total | Raw Count         | Count/M <sup>3</sup> | % of Total |
| Alternaria (Ulocladium)   | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Ascospores                | 1                 | 20                   | 4.8        | -                 | -                    | -          | -                 | -                    | -          |
| Aspergillus/Penicillium   | 7                 | 200                  | 47.6       | 3                 | 70                   | 63.6       | 3                 | 70                   | 16         |
| Basidiospores             | 2                 | 40                   | 9.5        | 1                 | 20                   | 18.2       | 3                 | 70                   | 16         |
| Bipolaris++               | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Chaetomium++              | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Cladosporium              | 4                 | 90                   | 21.4       | -                 | -                    | -          | 13                | 290                  | 66.4       |
| Curvularia                | 3                 | 70                   | 16.7       | 1                 | 20                   | 18.2       | -                 | -                    | -          |
| Epicoccum                 | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Fusarium++                | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Ganoderma                 | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Myxomycetes++             | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Pithomyces++              | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Rust                      | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Scopulariopsis/Microascus | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Stachybotrys/Memnoniella  | -                 | -                    | -          | -                 | -                    | -          | 1*                | 7*                   | 1.6        |
| Unidentifiable Spores     | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Zygomycetes               | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Cercospora++              | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Pyricularia               | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| <b>Total Fungi</b>        | <b>17</b>         | <b>420</b>           | <b>100</b> | <b>5</b>          | <b>110</b>           | <b>100</b> | <b>20</b>         | <b>437</b>           | <b>100</b> |
| Hyphal Fragment           | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Insect Fragment           | -                 | -                    | -          | -                 | -                    | -          | 3                 | 70                   | -          |
| Pollen                    | -                 | -                    | -          | -                 | -                    | -          | -                 | -                    | -          |
| Analyt. Sensitivity 600x  | -                 | 22                   | -          | -                 | 22                   | -          | -                 | 22                   | -          |
| Analyt. Sensitivity 300x  | -                 | 7*                   | -          | -                 | 7*                   | -          | -                 | 7*                   | -          |
| Skin Fragments (1-4)      | -                 | 1                    | -          | -                 | 1                    | -          | -                 | 1                    | -          |
| Fibrous Particulate (1-4) | -                 | 1                    | -          | -                 | 1                    | -          | -                 | 1                    | -          |
| Background (1-5)          | -                 | 2                    | -          | -                 | 1                    | -          | -                 | 1                    | -          |

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Gerald Iannuzzi, Laboratory Manager  
or other Approved Signatory

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| Lab Sample Number:<br>Client Sample ID:<br>Volume (L):<br>Sample Location: | 932205763-0007<br>CC07<br>150<br>Building 01-1-213 |            |                      | 932205763-0008<br>CC08<br>150<br>Building 01-1-224 |            |                      | 932205763-0009<br>CC09<br>150<br>Building 01-1-263 |            |                      |
|--|--|------------|----------------------|--|------------|----------------------|--|------------|----------------------|
|  | Spore Types  | Raw Count  | Count/M <sup>3</sup> | % of Total   | Raw Count  | Count/M <sup>3</sup> | % of Total   | Raw Count  | Count/M <sup>3</sup> |
| Alternaria (Ulocladium)  | 1*   | 7*         | 3.4                  | -  | -          | -                    | -  | -          | -                    |
| Ascospores   | 3  | 70         | 34.3                 | 1*   | 7*         | 3.4                  | 1  | 20         | 11.8                 |
| Aspergillus/Penicillium  | 6  | 100        | 49                   | 3  | 70         | 33.8                 | 3  | 70         | 41.2                 |
| Basidiospores  | -  | -          | -                    | 2  | 40         | 19.3                 | 2  | 40         | 23.5                 |
| Bipolaris++  | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Chaetomium++   | 1*   | 7*         | 3.4                  | -  | -          | -                    | -  | -          | -                    |
| Cladosporium   | 1  | 20         | 9.8                  | 4  | 90         | 43.5                 | 2  | 40         | 23.5                 |
| Curvularia   | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Epicoccum  | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Fusarium++   | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Ganoderma  | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Myxomycetes++  | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Pithomyces++   | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Rust   | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Scopulariopsis/Microascus  | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Stachybotrys/Memnoniella   | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Unidentifiable Spores  | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Zygomycetes  | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Cercospora++   | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Pyricularia  | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| <b>Total Fungi</b>   | <b>12</b>  | <b>204</b> | <b>100</b>           | <b>10</b>  | <b>207</b> | <b>100</b>           | <b>8</b>   | <b>170</b> | <b>100</b>           |
| Hyphal Fragment  | -  | -          | -                    | -  | -          | -                    | 1*   | 7*         | -                    |
| Insect Fragment  | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Pollen   | -  | -          | -                    | -  | -          | -                    | -  | -          | -                    |
| Analyt. Sensitivity 600x   | -  | 22         | -                    | -  | 22         | -                    | -  | 22         | -                    |
| Analyt. Sensitivity 300x   | -  | 7*         | -                    | -  | 7*         | -                    | -  | 7*         | -                    |
| Skin Fragments (1-4)   | -  | 1          | -                    | -  | 1          | -                    | -  | 1          | -                    |
| Fibrous Particulate (1-4)  | -  | 1          | -                    | -  | 1          | -                    | -  | 1          | -                    |
| Background (1-5)   | -  | 1          | -                    | -  | 2          | -                    | -  | 1          | -                    |

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Gerald Iannuzzi, Laboratory Manager  
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**Project:** 035.18478/ Cape Coral Technical College

### Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

| Lab Sample Number:<br>Client Sample ID:<br>Volume (L):<br>Sample Location: | 932205763-0010<br>CC10<br>150<br>Building 01-1-230 |            |                      | 932205763-0011<br>CC11<br>150<br>Building 01-1- |            |                      | 932205763-0012<br>CC12<br>150<br>Outside of Building 01-1-000 |             |                      |            |
|--|--|------------|----------------------|---|------------|----------------------|---|-------------|----------------------|------------|
|  | Spore Types  | Raw Count  | Count/M <sup>3</sup> | % of Total                                      | Raw Count  | Count/M <sup>3</sup> | % of Total  | Raw Count   | Count/M <sup>3</sup> | % of Total |
| Alternaria (Ulocladium)  | -  | -          | -                    | -   | -          | -                    | -   | -           | -                    | -          |
| Ascospores   | -  | -          | -                    | 1   | 20         | 11.1                 | 14  | 310         | 10.1                 |            |
| Aspergillus/Penicillium  | 3  | 70         | 51.1                 | 5   | 100        | 55.6                 | 22  | 490         | 15.9                 |            |
| Basidiospores  | 2  | 40         | 29.2                 | 2   | 40         | 22.2                 | 14  | 310         | 10.1                 |            |
| Bipolaris++  | 1*   | 7*         | 5.1                  | -   | -          | -                    | -   | -           | -                    | -          |
| Chaetomium++   | -  | -          | -                    | -   | -          | -                    | -   | -           | -                    | -          |
| Cladosporium   | -  | -          | -                    | 1   | 20         | 11.1                 | 68  | 1500        | 48.7                 |            |
| Curvularia   | 1  | 20         | 14.6                 | -   | -          | -                    | 11  | 240         | 7.8                  |            |
| Epicoccum  | -  | -          | -                    | -   | -          | -                    | -   | -           | -                    | -          |
| Fusarium++   | -  | -          | -                    | -   | -          | -                    | 3   | 70          | 2.3                  |            |
| Ganoderma  | -  | -          | -                    | -   | -          | -                    | 2   | 40          | 1.3                  |            |
| Myxomycetes++  | -  | -          | -                    | -   | -          | -                    | -   | -           | -                    | -          |
| Pithomyces++   | -  | -          | -                    | -   | -          | -                    | -   | -           | -                    | -          |
| Rust   | -  | -          | -                    | -   | -          | -                    | -   | -           | -                    | -          |
| Scopulariopsis/Microascus  | -  | -          | -                    | -   | -          | -                    | -   | -           | -                    | -          |
| Stachybotrys/Memnoniella   | -  | -          | -                    | -   | -          | -                    | 5*  | 30*         | 1                    |            |
| Unidentifiable Spores  | -  | -          | -                    | -   | -          | -                    | -   | -           | -                    | -          |
| Zygomycetes  | -  | -          | -                    | -   | -          | -                    | -   | -           | -                    | -          |
| Cercospora++   | -  | -          | -                    | -   | -          | -                    | 3   | 70          | 2.3                  |            |
| Pyricularia  | -  | -          | -                    | -   | -          | -                    | 1   | 20          | 0.6                  |            |
| <b>Total Fungi</b>   | <b>7</b>   | <b>137</b> | <b>100</b>           | <b>9</b>  | <b>180</b> | <b>100</b>           | <b>143</b>  | <b>3080</b> | <b>100</b>           |            |
| Hyphal Fragment  | -  | -          | -                    | -   | -          | -                    | 1*  | 7*          | -                    |            |
| Insect Fragment  | -  | -          | -                    | -   | -          | -                    | 4   | 90          | -                    |            |
| Pollen   | -  | -          | -                    | -   | -          | -                    | 4*  | 30*         | -                    |            |
| Analyt. Sensitivity 600x   | -  | 22         | -                    | -   | 22         | -                    | -   | 22          | -                    |            |
| Analyt. Sensitivity 300x   | -  | 7*         | -                    | -   | 7*         | -                    | -   | 7*          | -                    |            |
| Skin Fragments (1-4)   | -  | 1          | -                    | -   | 1          | -                    | -   | 1           | -                    |            |
| Fibrous Particulate (1-4)  | -  | 1          | -                    | -   | 1          | -                    | -   | 1           | -                    |            |
| Background (1-5)   | -  | 2          | -                    | -   | 1          | -                    | -   | 2           | -                    |            |

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Gerald Iannuzzi, Laboratory Manager  
or other Approved Signatory

No discernable field blank was submitted with this group of samples.

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Samples analyzed by EMSL Analytical, Inc. Tampa, FL A2LA Accredited – Certificate #2845.28

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For information on the fungi listed in this report, please visit the Resources section at [www.emsl.com](http://www.emsl.com)