



June 10, 2024

Dare County Schools  
Ian Adams  
3020 S. Wrightsville Avenue  
Nags Head, NC

**Re: Limited Indoor Air Quality Sampling with Airborne Fungal Sampling at First Flight Middle School, Kill Devil Hills, NC**  
**LRC Project – 24-2563**

At your request, on June 9, 2024, LRC Indoor Testing & Research, Inc. (LRC) performed a limited environmental fungal Indoor Air Quality (IAQ) sampling that included airborne fungal sampling at the property listed above.

LRC performs all water-damage and fungal investigations with sampling and recommendations in accordance with guidelines published in *Bioaerosols: Assessment and Control*, by the American Conference of Governmental Industrial Hygienists (ACGIH), in *Mold Remediation in Schools and Commercial Buildings* by the United States Environmental Protection Agency (USEPA), and in the currently recognized and accepted industry standards including the ANSI/IICRC S500 *Standard and Reference Guide for Professional Water Damage Restoration*, Fourth Edition (S500) and the ANSI/IICRC S520 *Standard and Reference Guide for Professional Mold Remediation*, Third Edition (S520).

Our inspection included the following:

1. Measure temperature and relative humidity indoors and outdoors.
2. Collect representative non-viable spore trap air samples indoors and one outdoors for comparison.
3. Provide a written report describing the survey results and comparing those results to accepted guidelines and directives. This report includes a summary of data and Certificates of Laboratory Analysis.

**BACKGROUND**

This inspection was limited to non-viable spore trap air samples that were collected from locations selected at random throughout the building along with temperature and relative humidity readings. Any descriptions in this report are based on looking at the structure from the street front. Moisture measurements and visual inspections were not conducted on this day.

## SAMPLING METHODOLOGY

### Air Samples:

Currently there are no regulations regarding acceptable airborne fungal levels. Airborne fungal spores are ubiquitous in the outdoor and indoor environment. The guidelines followed in this report for the assessment and/or remediation of airborne and surface fungi are published in *Bioaerosols: Assessment and Control*, by the American Conference of Governmental Industrial Hygienists (ACGIH), in *Mold Remediation in Schools and Commercial Buildings* by the United States Environmental Protection Agency (USEPA), in *Recognition, Evaluation, and Control of Indoor Mold* by the American Industrial Hygiene Association (AIHA), and in the ANSI/IICRC S520 *Standard and Reference Guide for Professional Mold Remediation*, Third Edition (S520). Airborne fungal assessments are performed by comparing results from volumetric samples taken indoors to samples taken outdoors. Airborne fungi levels in non-problem indoor environments generally are less than or approximately the same as that outdoors and also show a similar composition and/or taxonomic predominance. Problems are usually implicated in the indoor air when one or more fungal genera or species are present in a much greater concentration indoors compared to outdoors. Sampling results are shown in the Certificates of Laboratory Analysis attached to this report. Results are discussed below.

### Temperature and Relative Humidity

Temperature and relative humidity readings were recorded by the Lighthouse Handheld 3016 Particle Counter. ASHRAE Standard 55 for thermal comfort suggested that the indoor temperature should be between 73°F to 79°F in the summer and 68°F to 75°F in the winter and that the indoor relative humidity should be between 20% to 65%.

The temperature and relative humidity are summarized in Table A below. The relative humidity met the current ASHRAE Standard to maintain indoor relative humidity below 65%.

## SAMPLING RESULTS

### Total Non-Viable Spore Air Sample Results:

Representative samples were taken for total airborne fungal spores with a calibrated Buck spore trap. Total airborne fungal spore sample volumes were 75-liters. The outdoor total fungal spore level (Sample 11) was measured at 5547 Spores/m<sup>3</sup> and was comprised of *Cladosporium* (54%), Ascospores (15%), *Penicillium/Aspergillus* group (9%), Basidiospores (5%), and 3% or less of various other fungal spores. The air sample results are summarized below in Table A.

**Table A – Air Sampling Results**

| <b>Sample #</b> | <b>Location</b> | <b>Total Airborne Spore Count (Spores/m<sup>3</sup>)</b> | <b>*Non-Fungal Background Particulate Level</b> | <b>Temperature °F</b> | <b>Relative Humidity %</b> |
|-----------------|-----------------|----------------------------------------------------------|-------------------------------------------------|-----------------------|----------------------------|
| 01              | Cafeteria       | 253                                                      | Low                                             | 73                    | 56                         |
| 02              | Gym             | 293                                                      | Low-moderate                                    | 73                    | 55                         |
| 03              | CR H 120        | 200                                                      | Low                                             | 73                    | 51                         |
| 04              | CR J 122        | 280                                                      | Low-moderate                                    | 73                    | 56                         |

| Sample # | Location        | Total Airborne Spore Count (Spores/m <sup>3</sup> ) | *Non-Fungal Background Particulate Level | Temperature °F | Relative Humidity % |
|----------|-----------------|-----------------------------------------------------|------------------------------------------|----------------|---------------------|
| 05       | Hall at CR A103 | 213                                                 | Low                                      | 74             | 56                  |
| 06       | Hall at CR K132 | 240                                                 | Low-moderate                             | 73             | 57                  |
| 07       | Hall at CR L119 | 347                                                 | Low-moderate                             | 72             | 57                  |
| 08       | Hall at CR K118 | 267                                                 | Low-moderate                             | 74             | 57                  |
| 09       | Hall at Media   | 213                                                 | Low-moderate                             | 73             | 57                  |
| 10       | Hall at J 111   | 293                                                 | Low-moderate                             | 73             | 55                  |
| 11       | Outdoor Air     | 5547                                                | Moderate                                 | 91             | 53                  |

\*The Background Particulate Level refers to non-fungal debris seen in the air sample; such as skin cells, hair, fibers, dust, dirt, etc.

The total fungal spore counts in the areas sampled indoors were lower than that found in the outdoor air. The types of fungal spores found in the indoor air samples were all common outdoor-type fungi present in low concentrations with no spikes in water loss fungi. Therefore, the results suggested a normal indoor fungal ecology in the areas sampled.

The particulate in the indoor air samples was in the low to low-moderate range. The particulate that we see in the microscope at the magnification used is usually called ‘course particulate’ and consist of many things and can include the following: dirt, dust, mold, pollen, fiber, hair, skin cells, dust mites and other insects. Fine particulates (to include VOC’s – volatile organic compounds) are not seen with the magnification used for these samples.

## CONCLUSIONS

Results as reported by LRC apply only to the day of this inspection. LRC cannot and does not warranty that other parts of the structure were completely free or that the structure will remain free in the future from hidden sources of moisture or fungal contamination.

This inspection was limited to indoor air quality parameters. The indoor air samples did not show a fungal amplification or an altered indoor fungal ecology on this day. Relative humidity was in the recommended range. This inspection was limited to indoor air quality.

If you have any questions or concerns, please do not hesitate to contact us.

Sincerely,

A handwritten signature in cursive script that reads "Cathy A. Richmond".

Cathy Richmond, B.S.  
LRC Indoor Testing & Research

A handwritten signature in cursive script that reads "Tony Richmond".

Tony Richmond, BBA, CAI, WRT  
LRC Indoor Testing & Research