FLORIDA STATE UNIVERSITY
COLLEGE OF HEALTH AND HUMAN SCIENCES
Department of Nutrition and Integrative Physiology

Dr. Richard McCullough
President Florida State University
211 Westcott Building
Florida State University
Tallahassee, FL 32306-1470

January 21, 2022

Dear Dr. McCullough:

We want to make you aware of serious concerns related to the safety of the Sandels Building housing the College of Health and Human Sciences. This enclosed report includes a summary of major concerns and a detailed explanation of issues with the air quality, possible chemical exposure, high radon levels, and a cancer cluster in the Sandels Building.

Drs. Lynn Panton, Michael Ormsbee, Gloria Salazar, and Qinchun Rao have gathered evidence, testimonies from faculty and families of former faculty and students and put together this report on behalf of the faculty and staff of the Department of Nutrition and Integrative Physiology. This report is also supported by the staff of the Dean's Office and the faculty from the Department of Human Development and Family Science and the Jim Moran College of Entrepreneurship (former Department of Retail, Merchandising and Product Development).

We would like to meet with you in person to discuss the details of this report at your earliest convenience.

Thank you,

Lynn Panton, Ph.D.
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Michael Ormsbee, Ph.D.
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Gloria Salazar, Ph.D.
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Former Faculty Senator (2019-2021)

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CC: Michael Delp, Professor and Dean, College of Health and Human Sciences, mdelp@fsu.edu
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Hazardous Working Conditions: Sandels Building, Florida State University

January 21, 2022

On behalf of the Faculty and staff of the Department of Nutrition & Integrative Physiology with support from the staff of the Dean's Office, and the Faculty from the Department of Human Development and Family Science and the Jim Moran College of Entrepreneurship (former Department of Retail, Merchandising and Product Development).

The purpose of this letter is to inform President Dr. Richard D. McCullough and the Faculty Senate of serious health concerns related to the safety of the Sandels Building and to request immediate remediation actions.

A. Summary of concerns

First and most alarming is the high number of cancer cases among faculty and students. The cases are mostly clustered in the East wing of the 4th floor of the Sandels Building (see floor map in **Figure 1**). Eight cases, including 5 faculty and 3 former graduate students, have been diagnosed with cancer in the last 10 years (see **Table 1**). Sadly, one faculty member and two former graduate students have died.

Second, as documented in emails and written communications over the last 20 years, the air quality in the Sandels Building is poor. The most common complaint documented from faculty over the years is black particles coming out the ventilation system and accumulating on office desks, lab benches and classrooms. This led to an evaluation of the air quality in 2009 by Rejuvinair. The report (see **Appendix 1**) found **elevated** particles of *Cladosporium*, *Chaetomium* and *Stachybotrys* ("black mold" or "toxic mold") and **high to very high levels of non-viable material** in the HVAC coils. In 2021, the College of Health and Human Sciences decided to perform an independent assessment of the air and water quality (see reports in **Appendix 2 and 3**) on behalf of the faculty housed in the Sandels Building. The report found that the accumulation of dust in the ventilation system over the years is the source of the black particles and debris. Importantly, the report also indicated **elevated** fungal quantities of *Clasdosposium sp.* in ambient air and surfaces, with one of the highest amounts in the laboratory of Dr. Sathe, who passed away from cancer in 2019. Dr. Sathe's former graduate student also passed away with a similar cancer in 2018. The report also indicated that there was **elevated moisture** in some rooms throughout the building. Unfortunately, it is unknown how extensive the moisture and fungal problems are as only a few rooms were tested (2 rooms on the 2nd floor and 5 rooms on the 4th floor). The basement was not included in this evaluation. It is known that the Sandels basement laboratories are also covered in the black particles. Sandels basement areas have flooded numerous times, affecting the flooring and walls. Some of the carpet and flooring have been removed but not in all the affected areas. More recently, on January 16-19, 2022, **elevated radon** levels were detected in the basement as well as in the Dean's Suite on the second floor (ground level).

Third, is a possible exposure to toxic chemicals. The East wing of the 4th floor, in which most cancer cases are clustered, houses most of the research labs. Two chemical fume hoods have unknown substances/debris coming down from the ceiling (Rooms 442G and 442E). These substances reappear a few days after cleaning. Room 442E is where chemicals are stored. This room was cleaned in December 2020-January 2021, and reagents were discarded through FSU EH&S. A list of the discarded reagents was not provided to us by EH&S (as was requested by email on January 12, 2021), but cyanide was found among the reagents.

Lastly, many faculty members report autoimmune flareups, issues with breathing, and general concerns such as headaches that are exacerbated when they are in the Sandels Building, (evidenced by the COVID year gap of 2020-2021).

Because of these serious concerns, the faculty of the Department of Nutrition and Integrative Physiology as well as others that work in the building are concerned with the safety of working in the Sandels Building. As stated by the Occupational Safety and Health Act (OSHA), we have the "right to safe and healthful working conditions".

B. Immediate remediation actions wanted by Faculty:

1. Faculty will teach remotely, and classes that can't be taught remotely will be moved to other buildings.
2. For research faculty, provide new laboratory space by Summer 2022 and immediately provide air purifiers for research labs and offices.
3. Develop and implement a move for all faculty, staff and students as well as laboratories currently in the Sandels Building to a new safe location by Summer 2022.
4. Measure radon levels in other buildings at FSU as a preventive measure for other faculty and staff as well as students in the University Community.

As a result of these concerns, the faculty will report these incidents to OSHA and request an independent investigation.

Faculty are deeply concerned about these safety issues that are likely safety violations. The above changes are needed to ensure the safety of the students, faculty and staff, and to maintain the momentum of our research productivity and grant funding. Faculty in our department have obtained over $10 million in grant funding in the last five years (NIH, USDA, FDOH, among others), due in part to our strategic recruitment of nine new research faculty. Due to the safety concerns expressed above, we fear that it will be difficult to retain current faculty and recruit new faculty to the Department and University.

In the following sections, we present a detailed explanation of the cancer cases and the many reports of issues with air quality and chemical exposure. *The medical information disclosed in this report was provided by the affected faculty, student and families of the people that have died of cancer.* In addition, evidence for faculty reports to administration and EH&S dating back to 1980's are shown below.

C. Detailed timeline and reports of serious concerns

C1. <u>Air quality</u>

C.1.1. Timeline of air quality reports and assessments

The Sandels Building was constructed in 1956 to house the College of Home Economics, now the College of Health and Human Sciences. The College had three departments, Retail, Merchandising and Product Development, Family and Child Sciences, and Nutrition, Food and Exercise Sciences. The Department of Retail, Merchandising and Product Development was moved to the Jim Moran College of Entrepreneurship in 2018. With the exception of the textile lab, which remains on the 3rd floor of Sandels, the Departments of Nutrition and Integrative Physiology and Human Development and Family Science currently occupy the Sandels Building. The building has space allocated for offices, classrooms (1st, 2nd, 3rd and 4th floors) and research labs (1st and 4th floors). Clinical studies are performed on the 1st floor and basement of the building.

Room B0002 in the basement has also been used for animal studies (approved by FSU IACUC) by Dr. Kim's lab.

Several issues related to the building have been reported over the years by personnel working in the building since the mid-1980s (see **Figure 2**). One major issue was excessive humidity and constant mold mainly in the Dean's Suite, witnessed by Marian Sumner, an Administrative Specialist working in the Dean's Office since 1985. In the late 1980s, the building was sinking. This was mitigated by constantly pumping water into the foundation to stabilize the building. It is unclear whether the renovation of the building in 1998 was designed to fix the structural issues of the building. After the renovation, the issue with the humidity and mold continued until this date. In the mid-2000s, asbestos was removed, as reported by Ann Smith, an Administrative Assistant for the Department of Nutrition and Integrative Physiology (retired). However, there are no records of where the asbestos was found, nor was an exact date of removal known.

Reports of black particles have been a constant concern for faculty since the early 2000s. Dr. Peggy Hsieh and Dr. Doris Abood, among other faculty, reported, on several occasions, significant amounts of black particles on benches in the lab and offices to FSU EH&S. This led to the air quality assessment and cleaning of the ventilation system in 2009 by Rejuvinair (see report in **Appendix 2**). Marian Sumner, the current Administrative Assistant to Dean Delp, sent the following message to the College on August 31, 2009:

> *Over the past few years several people have experienced allergy, sensitivity and health issues which they attributed to the air quality in the Sandels Building. Mid-May the University had Rejuvinair come in and clean, sanitize, sterilize and decontaminate the air conditioner coils. I have been asked to report and maintain a complaint records log of any complaint with air quality in the building. It is very important that you let me know if you have any issues which you can directly attribute to being in Sande ls Building. This will help the University know if the plan they have in place is working. Thanks, Marian*

Dr. Abood, Associate Professor in our department (retired), sent the following email to Marian Sumner as a result of the air quality assessment on August 31, 2009:

> *Hi Marian: I just had the cleaning crew discard the filter that was on the HEPA filter in my office. I wish that I had saved it now that I have read your email. It was totally covered in black gunk. I also had the crew discard the air machine as it too was infiltrated with whatever matter was on the filter. It's hard to determine if the misery I feel in my office is due to just the air coming from the vent or a combination of a dirty carpet and the dust that is all over my office. I will tell you that when teaching in 401 (not so much in 407) I can barely get through a lecture without constantly drinking water and even that doesn't prevent the congestion I have when I'm done. I plan to get yet another filter for my office.*
>
> *It would help greatly if I could get a diverter placed on my vent in my office as the air blows right on me and as a result I cough most of the time. I have the same problem in 401 when standing in the front of the room. The air streams out of the vent and I have to keep moving in order to not constantly cough. The diverters and a new, perhaps stronger air filter in my office may help with what seems to be an air quality problem not amenable to coil-type interventions. The problem may be in the duct work but I really don't know. I try to limit my time in my office as much as possible. Unfortunately, that isn't always possible.*

The air quality assessment by Rejuvinair identified higher than normal/recommended levels of *Cladosporium*, *Chaetomium* and *Stachybotrys* in most of the HVAC coils tested (**Appendix 1**). The report mentioned that the Word Health Organization states that "pathogenic and toxigenic fungi are not acceptable in indoor air … at levels that are over 100/m^3 above the outdoor air's concentration". Of particular concern was *Stachybotrys,* also known as "black mold" or "toxic mold", which should not be detected at all in indoor air. The assessment also found high to very-high levels of non-viable material such as dust, dirt, hyphal fragments and pollen. The report went on to say that the "combination of non-viable and viable buildup of bioaerosols leads to poor air quality and the potential for occupant illness due to inhalation and respiration of these particles". Although the evaluation of the HVAC coils after the cleaning showed no signs of mold, issues with poor air quality and black particulates falling from the vents have continued until the present day.

Lauren Ormsbee, the Research Study Coordinator in Dr. Arjmandi's lab, sent the following email to Marian Sumner, David Parish and Christine Apgar reporting a bug infestation and unsafe conditions in the basement on September 10, 2020:

> *There is a significant bug problem in the basement of Sandels in the clinical space. We have had issues in the past with a cockroach or two but today I have now seen/killed: spiders, a cockroach, silver fish, found a dead small lizard, and ants. I am all for roughing it but today was a bit much and would have been embarrassing if any research participants had been in. Could someone possibly come spray and come on a regular schedule for this?*
>
> *I was also wondering about the black particles that are blowing out of the vents. I understand this is sort of a whole building issue and the ones down here are covered with cheesecloth, but it is still concerning seeing the amount that is resting on the cloth and knowing that we and participants are breathing this stuff in. Can anything be done?*

David Parish responded:

> *Hi, Marian and Lauren,*
> *I'll turn in a work order for the bugs and ask them to spray again. I can turn in a work order for the dust particles too, but I'm not sure what they can do if there is already cheese cloth over the vents. That has been the "go to" solution for all areas that have requested it.*

She also requested, on numerous occasions, to have a deep cleaning completed on the research facility in the basement. An example is the email on July 28, 2021:

> *Thank you Mr. Parish, this is very appreciated! Also thank you to whoever put the order in for the cleaning. For the first time in years, I came in on Friday to the floors having been mopped/chairs up on tables and it smelled clean. I know there are lots of other renovations going on in the building and 4th floor, but is there any way to move replacing the carpet down here to priority? It is mildewed and stained and I would bet moldy underneath. The space is a terrible first impression for community members participating in research.*
> *Best,*
> *Lauren*

In another email the same day:

It just is feeling unhealthy down here. I appreciate this!
Best,
Lauren

Below are some of the concerns submitted to Dean Delp on January 11, 2021, by faculty members:

> **Michael Ormsbee:** *It is important to also note the black stuff coming out of the air vents throughout the building, especially in the basement labs, and mold reported by some faculty. I know the basement has been flooded many times and the carpet was not entirely removed. You may also recall that Lauren experienced and had major surgery for cancer last year…she has spent an enormous amount of time in the Sandels basement since 2010. Some of the issues I'm hearing about are beyond the aggressive cancers we've seen and along the lines of general health and autoimmune issues. I'm curious too as to if others have anything going on but have not voiced it publicly.*
>
> **Michael Delp note:** *We have had mold and mildew issues and black particles coming through the vents throughout the building. For example, we remodeled the Dean's office suite and mold and mildew were everywhere. Black particles also routinely come out of the air vents in the Dean's office suite.*
>
> **Marian Sumner, Dean's Office Suite***: I have experienced allergy issues for years while working in the Dean's Office. As soon as I enter the building, I begin coughing. This continues throughout the day. When I am away from the building, for a week at the time (vacation) I feel so much better.*
>
> **Gloria Salazar:** *There has been a water leak in the ceiling of my lab (442D) for a few years now. This is noticeable after a heavy rain since I have to put a bucket for the water on top of the bench. I have reported this many times over the last few years, but it keeps happening. It seems to me that the leak might be small since a light rain doesn't lead to a substantial accumulation of water. However, a water leak of any size will eventually promote mold growth. Facilities have come a number of times to see the leak. They remove a panel on the celling, take a look and leave. It is upsetting when we are ignored by complaining about the deficiencies in this building, but I am glad you are taking this seriously and I hope there will be real solutions to these problems. It is unimaginable that someone will say that it is safe to breath particles coming out of the vents, as we have been told in the past. Breathing particles of any kind is dangerous.*

The black particles are ubiquitous throughout the Sandels building, even in newly renovated labs. From Steve Hennigar, Assistant Professor of Nutrition, whose lab was renovated in 2018 and is located in Sandels 405 (May 15, 2021):

> *Hi Marian,*
> *Should I respond to Jim directly if we're having issues with blackparticles?*
> *The cheese cloth in Sandels 401B was replaced with another cheese cloth yesterday. Is it possible to get a filter installed instead? I think they are using cheese cloth because the vent is long and thin and not square like the one pictured below. Either way, it's not very effective. The vent is directly above a lab bench, and the black particles make the area unusable.*

Thanks for your help.
Sincerely,
Steve

Due to the many complaints from faculty and staff, on June 15, 2021, the University agreed to push for funding to have the Sandels Building air handlers and ductwork cleaned by an outside vendor. Assistant Director of Environmental Health and Safety, Laymon Gray, said they would not have the black particles tested. The College therefore funded an independent evaluation of the air quality, which was performed by AIRMD. See report in Appendix 2 and overall findings in section C1.2 (Dean's message on August 26, 2021)

C1.2. Timeline of actions taken by Dean Delp in response to faculty concerns

From email to the Department on September 1, 2021

Dear All,

Many of you have experienced black particles falling from the building airducts into your offices and labs in Sandels Building. Prior to my coming to FSU, the College inquired about these particles, and were told that they were part of the insulation in the air ducts that was breaking off. The ongoing issue with these particles led us to inquire again this spring about whether the black particles represent a health and safety concern. Below is a timeline of actions the College has taken to ascertain whether these particles might be hazardous.

Mid-May 2021: *We submitted a case to Environmental Health and Safety concerning the black particles. The Interim Director of Environmental Health and Safety, Jim Stephens, responded "The good news is that the University through normal preventive maintenance and reviews of HVAC systems works to ensure that the air is safe. EH&S and Facilities work together on issues such as yours to make sure that we not only assure health and safety, we also work to eliminate issues such as the particulate matter you have described." Facilities began placing filters over the AC vents in those areas reported with issues. We asked that the black particles be tested and were told that FSU would not have testing done.*

Mid-June 2021: *The College moved forward to secure an outside company to sample test the air, water, and the black particles in Sandels.*

July 8, 2021: *Facilities notified us they were moving forward with obtaining pre-bid contracts for airduct cleaning in Sandels*

July 13, 2021: *College Purchase Order was issued to AIRMD Inc. for sample testing the air, water, and black particles.*

July 28, 2021: *A representative from AIRMD was in the building taking samples.*

August 2, 2021: *Facilities notified us they had secured the funding needed for the Sandels airduct cleaning. The contract was awarded to Service-Tech Corporation. A separate outside consultant not affiliated with Service-Tech Corporation was also hired to perform pre- and post-cleaning checks of the airducts to confirm the cleaning performed by Service-Tech Corporation is being done to the purchase order specifications. In other words, the consultant will serve to confirm that the airducts are properly cleaned.*

We notified Facilities and Environmental Health and Safety that we were waiting on independent test results of Sandels water and air. We asked that they wait for those results before the duct cleaning is performed to make sure that all issues are addressed.

August 18, 2021: *The College received the testing results and reports from AIRMD.*

August 24, 2021: *The College provided AIRMD reports to FSU Environmental Health and Safety and Facilities and requested to meet with them once they read the reports.*

August 26, 2021: *I met with representatives of Environmental Health and Safety and Facilities regarding the AIRMD reports we provided. The executive summary of the air quality report stated the Bio-aerosol sampling conducted identified elevated fungal quantities belonging to Cladosposium sp. in several of the rooms tested. As no known cause was identified, AIRMD recommended evaluating the air conditioning systems to identify if it is a contributory source. If it is a contributory source, the system should be cleaned in accordance with NADCA standards. If it is not a contributory source, invasive testing should occur prior to commencement of work. Assessment should be completed by an Air Systems Cleaning Specialist (ASCS), Certified Ventilation Inspector (CVI), or equivalent, to determine the preliminary state of HVAC system cleanliness and condition of the ductwork.*

The AIRMD representative, as well as FSU Environmental Health and Safety, stated that the black particles coming out of the airducts are not insulation, but rather the result of 50 years of dust accumulation in the airducts. The black particle dust is likely infused with the Cladosporium fungus, which is very common in Florida. FSU Environmental Health and Safety further stated that Cladosporium is present in the human mycobiome and is rarely pathogenic to humans.

The water sampling results identified that Coliforms, E. coli, Lead, Iron, Manganese, Nitrate, Nitrite and Turbidity were ***not*** *present in the samples and the pH was within the federal limit.*

September 7, 2021: *Service-Tech Corporation begins duct cleaning. All work will be done over-night between 6 pm and 7 am. The entire project may take 4-5 weeks. At the present time we do not know what order the offices and labs will be cleaned over the 4–5-week period. However, the cleaners will need access to each airduct, so belongings/materials in the offices and labs will need to be arranged to give them access. I know this will be an inconvenience, but I think we will all be happier and healthier with a clean air handling system.*

We will keep you informed of the areas being worked on as soon as we know.

Sincerely,

Michael

Before the cleaning started, Dr. Salazar took pictures of the filters covering the air vents in her lab in Rooms 442C and 442D on September 6, 2021 (**Figure 3**). Also, Dr. Kim and Dr. Salazar took several pictures of Dr. Kim's lab in Room 440. Images show lab benches and equipment covered by black particles (**Figure 4**) as well as the filters that covered the air vents on the ceiling of Dr. Salazar's (**Figure 3**) and Dr. Kim's labs (**Figure 5**).

As of January 2022, the cleaning of the ventilation system has not been completed. The work is expected to be completed by the end of January 2022. However, after 4 months of cleaning, black

particles are still falling on desks, benches and floors in classrooms, labs and offices in Sandels. Dr. Gloria Salazar sent the following email to Marian Sumner on January 13, 2022:

> *Marian*
> *We have a lot of black particles in the benches and floor (big chunks) in the 442C lab. We currently have filters in 442D, but not in 442C. We spent a lot of time cleaning the labs last week and place new bench pads and now is all dirty again. Can we have filters place in this room?*
> *Thank you*
> *gloria*

Pictures taken on January 4 and 16, 2022, showing that small black particles keep falling on top of benches and equipment even after air vents were covered. For example, photos were taken of filters in Dr. Salazar's lab (442D) (**Figure 6**), the darkroom (442A) (**Figure 7**) and Dr. Kim's desk in Room 100B (**Figure 8**) on the 1st floor at Sandels.

Of concern, on January 18, 2022, facilities removed a filter in Dr. Salazar's lab (room 442C) that had not been changed since 2003 (**Figure 9**). As seen in panel A of the figure, the paper of the filter has completely disintegrated and converted into chunks of black material. Panel C of the figure shows that the filter hasn't been changed in almost 20 years. It is unknown how many other filters in the building are this old or have not been replaced as scheduled (every 3 months). We fear that facilities might not keep records of incidents like this. Dr. Salazar sent the following email to Marian Sumner on January 19, 2022, reporting this finding and the unprofessional behavior from Robert Lewis (facilities supervisor):

> *Dear Marian*
> *I would like to report an incident related to an interaction with the supervisor of our building Robert Lewis this morning. A filter in my lab in room 442D was replaced yesterday by facilities. According to the facilities personnel, the filter for the coils suppling air to rooms supposed to be changed every 3 months. The filter they removed was from November 5, 2003 and has not being replaced for almost 20 years. I kept the filter.*
>
> *This morning Robert Lewis demanded the filter from me. He said: "who gave you the authority to keep this filter" " You have to give it to me"*
> *First, this is not the appropriate way to address faculty. Second, I fear that they may want to get rid of this evidence. We have complained for so long about "black particles" in the building and being told over and over that the air is safe. Seen this makes me sick to my stomach*

C2. <u>Radon exposure</u>

Dr. Salazar and Dr. Rao measured radon levels in some of the labs and offices on the ground floor of Sandels. As seen in **Figure 10**, radon levels were <u>alarmingly elevated</u> in Room B0007A in the basement (48 h reading of **13.05** pCi/L), the Dean's Office in Room 242J (15 h reading of **8.1** pCi/L), Marian Sumner's office in Room 242I (5 h reading of **5.67** pCi/L) and Room 242M (5 h reading of **7.08** pCi/L).

From radon.com (https://www.radon.com/radon_levels):

> "Radon gas is a naturally-occurring by product of the radioactive decay of Uranium in the soil. Depending on your geographic location, the radon levels of the air you breathe outside of your home may be as high as 0.75 pCi/L. The national average

of outside radon levels is 0.4 pCi/L and it is estimated by the National Academy of Sciences that outdoor radon levels cause approximately 800 of the 21,000 radon induced lung cancer deaths in the US each year"….. "Lung cancer risk rises 16% per 2.7 pCi/L increase in radon exposure". "even with an action level of 2.0 pCi/L, the cancer risk presented by radon gas is still hundreds of times greater than the risks allowed for carcinogens in our food and water".

The EPA recommends taking mitigation actions for radon levels between 2 and 4 pCi/L. The levels found at Sandels are extremely high and unsafe. These measurements have to be confirmed by a professional company.

Importantly, on January 19, 2022, Dean Delp announced an immediate cessation of teaching and research activities in the building in the following email:

To all faculty, staff and grad students in Sandels

Dear Sandels Faculty, Staff and Students,

The college will be seeking to have further air testing performed in Sandels building. I am asking that all faculty, staff and students with offices and classes in Sandels building to work and hold classes remotely until February 1st. Please come to your office in the next day or two to remove anything you need to work and teach remotely; this only applies to teaching in Sandels building. Once the air testing commences, we will need to limit people going in and out of spaces in order for the testing results to be accurate. Also, during the testing we need all building windows to be closed.

If anyone has any difficulties working remotely, please contact your department chair and Josh Kukus. We will work to accommodate everyone.

I am very sorry for this short notice and inconvenience, but we want to make sure that the work environment is safe for everyone.

Best wishes,
Michael

C3. Chemical exposure

In addition to the poor air quality in the building, there is a growing concern that the cancer cluster on the 4th floor could be related to exposure to toxic chemicals. Most of the research labs are located in this area and this is where the chemicals are stored. Room 442E had a chemical hood and biosafety cabinets for flammable and corrosive liquids, as well as cabinets for chemicals (powder form). Many reagents have accumulated in this room over the years after faculty retired. Some chemicals date back to 1985. Also, an unknown yellow liquid and debris accumulated in the hood in Room 442E. The hood was cleaned several times and the mysterious substance kept reappearing after a few days. We were told by Facilities and EH&S in several occasions that this was part of the insulation that was leaking out in the ceiling. However, the insulation is not liquid, and it is not yellow.

Dr. Gloria Salazar oversaw the cleaning of this hood, reagents and lab in Room 442E in 2020-2021. She sent the following email to Dr. Delp on January 11, 2021:

> **Gloria Salazar:** *We recently removed old chemicals from the small room by my lab where the old chemical hood is located. EHS took 3 large bins with chemicals. Among them was a large package of cyanide. I don't know if there were other toxic chemicals. I will ask EHS to find out more information of the chemicals they removed. Of concern is the yellow powder/liquid that is constantly accumulating in that old hood. I clean it before, but more stuff keeps coming down from the ceiling of the hood. Please take a look at it.*
>
> **Michael Delp note:** *Do you have a record of the chemicals that were recently removed from the hood in this area? As indicated in my previous email, I will send the current chemical inventories of the mentioned labs once I have them.*

The following email from Benjamin Airline, Assistant Chemical Safety Officer, was sent to Dr. Salazar on January 12, 2021 upon request of a list of chemicals removed from Room 442E:

> **Benjamin Airline:** *If they are the recently removed items from your lab, we still have those in our facility. The items removed prior to December have already been shipped out through our waste disposal vendor. I do have a manifest from that shipment, but it would be cumbersome to comb through it to find what exactly came from your lab.*

From the many reagents removed from Room 442E, Dr. Salazar remembers a bottle of about 500 g of cyanide and several bottles (about 6, 1 kg each) of acrylamide in crystalline solid form. Acrylamide is used in the laboratory to form gels that separate proteins. It has been heavily used in labs 442C, D, and G. Exposure to high doses of acrylamide in the workplace can cause nerve damage, disorders of the nervous system and cancer when ingested or inhaled.

The hood in Room 442E was removed in 2021. At that time, Dr. Salazar asked the EH&S (Andrew Davis) to test the yellow substance to know whether it could be dangerous to personnel removing the hood. Samples were taken. When asked, Andrew Davis mentioned that only the pH was measured, and that the substance was most likely a compound containing sulfur due to its yellow color. Pictures were not taken before the hood in Room 442E was removed, but images in **Figure 11** show lines of a yellow substance dripping from the ceiling in the wall where the hood was located.

More recently, Dr. Leqi Cui, a new Assistant Professor in Food Science, reported debris falling into the chemical hood in his lab (see **Figure 12**). Dr. Cui was assigned the lab in Room 442G, previously Dr. Sathe's lab. Dr. Cui submitted the following email on January 4, 2022:

> *I am writing to express my concerns about the safety issues in Sandels. There are four labs of four faculties at one corner of the fourth floor in Sandels Building. It has been confirmed that two of the four faculties and one student were diagnosed cancer. This is unnormal. Unfortunately, one of the faculties passed away. Since I took the lab of this faculty, I have been noticing that lots of unknown stuff dropping into the hood in my lab at 442G (please see attached pictures). These stuffs accumulate quickly after I clean them. Altogether these raise serious concerns about the safety issues in this building, and I sincerely expect the department, the University to take action to provide us faculties a safe working environment.*

In conclusion, it is unknown how many and what type of dangerous and toxic chemicals were stored in Room 442E since the list of reagents taken by EH&S was not provided. It is also unknown whether a combination of toxic chemicals, mold and black particles/poor air conditions in the east wing of the Sandels Building contributed to the cancer cluster affecting faculty and students on the 4th floor.

In summary, we have been told for many years by Facilities and EH&S staff that the air in Sandels Building and the black particles we breathe every day are safe. No testing was done by these entities to come to this conclusion. The fact is that 8 people have cancer, 3 have died, and who knows how many will develop cancer or other serious conditions in the future after being exposed to mold, fungus, toxic chemicals and/or high radon levels detected in the building.

D. Cancer cases

Dr. Yun-Hwa "Peggy" Hsieh, Emeritus Professor of Food Science and member of the Dean's Advisory Council

Dr. Hsieh was hired in 2003 as a Professor in Food Science. Her lab was in Room 423 in the Sandels Building, and her office was located in Room 420 of the building. As mentioned before, she reported twice to FSU EH&S regarding a significant amount of the black particles falling on the countertop in her laboratory between 2005 and 2010. She has been diagnosed with cancer and several conditions, and she has never smoked. A timeline of diagnosis of several conditions, including cancer, is provided below:

- August 2010: diagnosed by a pulmonologist to have acute atypical pneumonia, which occurred repeatedly in the following 5 years she continues to suffer from uncured "Bronchiectasis" and "MAC (*Mycobacterium avium* complex) pneumonia.
- November 2010: diagnosed with an autoimmune disorder (Mixed Connective Tissue Disease).
- February and October 2015: diagnosed with neoplasm of connective tissue
- April 2016: diagnosed with 4 malignant mucosal melanomas (Clark's level, at least III)

Mixed connective tissue disease (MCTD) has signs and symptoms of a combination of disorders like primarily lupus, scleroderma, and polymyositis. Many people with this uncommon disease also have Sjogren's syndrome. For this reason, MCTD is sometimes called an overlap disease.

Bronchiectasis is a chronic condition where the walls of the bronchi are thickened from inflammation and infection that causes coughing up of mucus. Bronchiectasis may be caused by cystic fibrosis, past severe infection that has damaged the lung, immune system conditions that make it difficult to fight off infections, aspirating (breathing in) things like fluids, stomach acid, or foods or other particles into the lungs, and allergic bronchopulmonary aspergillosis, an allergy to a particular type of fungus.

MAC lung disease is an infection caused by a group of bacteria called *Mycobacterium avium* complex (MAC). MAC includes two closely related species, *Mycobacterium avium* and *Mycobacterium intracellulare,* and may also be referred to as MAI. MAC is one of a large group of nontuberculous mycobacteria (NTM), and the most common cause of NTM lung disease in the US MAC organisms are common in soil and water and are easily inhaled during daily activities. Most of the time, they cause no harm, but MAC organisms can cause infection in groups with certain risk factors like people living with lung disease such as bronchiectasis, and people with a weakened immune system.

While most melanomas develop in the skin, mucosal melanoma is always internal. It begins in the mucus membranes that line various parts of the body. Mucosal melanoma is very rare, accounting for 1 percent of all melanomas. Risk factors include chronic inflammatory diseases,

genetic factors, chemical irritants, smoking and inhaled environmental carcinogens (https://dermnetnz.org/topics/mucosal-melanoma).

Dr. Shri Sathe Professor of Food Science, Robert O. Lawton Distinguished Professor and Hazel K. Stiebeling Professor

Dr. Sathe joined the department in 1988 as an Assistant Professor of Food Science. He had 2 labs in Room 442G and Room 442C and an office in Room 402 of the Sandels Building. Dr. Sathe was diagnosed with several malignancies over the course of 8 years, as described below:

- October 2012: **Squamous cell carcinoma on gum**.
- October 2015: **Cancer of buccal mucosa on one cheek**.
- February 2019: **Cholangiocarcinoma (bile duct cancer**).
- April 2019: Died as a result of **bile duct cancer**.

Cholangiocarcinoma is a deadly disease. Even when detected early, the five-year survival rate for people with this cancer is less than 25%. It is caused by genetic factors and chronic inflammation of bile ducts, such as from infections or liver disease.

Dr. Jeong-Su Kim, Professor and former Graduate Program Director

Dr. Jeong-Su Kim was hired in 2006 as an Assistant Professor in Exercise Sciences and was diagnosed with stage 4 lung cancer in 2020. His lab is located in Room 440 and his office was in Room 432 (2008-2019) and B0002 (2019-present) in Sandels Building. Dr. Kim leads an extremely healthy lifestyle doing aerobic exercise and/or resistance training at least 5 days a week. As a professor of Exercise Physiology, he exercises regularly, never smoked and has no pre-existing conditions or family history of lung cancer. Dr. Kim's lab has one of the highest levels of black particles in the ventilation system and on top of bench surfaces and floor (see **Figures 4 and 5**). A timeline of disease progression and cancer diagnosis is provided below:

- December 2019–February 2020: abnormal and prolonged illness with persistant coughing and weakness.
- March–July 2020: On/off with chronic and progressive neck pain.
- August–December 2020: Severe progressive and unbearable neck pain.
- December 2020: diagnosed with **stage 4 lung cancer (EGFR-positive lung cancer**) based on an MRI scan and tissue biopsy on his neck, which indicated severe metastasis of lung cancer cells to the C2 through C7 bones (damaged and degraded C2-C7 bones) and other spines and bones including pelvis.
- December 2020 – Present: Series of necessary treatments including targeted medicines, radiation, chemotherapy, and other IV infusions, injections and several oral medicines with regular MRI, PET-CT, CT, and bone scans to monitor symptoms and progression.

EGFR-positive lung cancer refers to lung cancers that show evidence of an EGFR mutation. EGFR, or epidermal growth factor receptor, is a protein present on the surface of both healthy cells and cancer cells. When damaged, as can occur in some lung cancer cells, EGFR doesn't perform the way it should. Instead, it causes rapid cell growth, helping the cancer spread. Risk factors include air pollution exposure and occupational exposures such as asbestos, metals and diesel fumes (https://www.healthline.com/health/lung-cancer/egfr-mutation-lung-cancer#risk-factors).

Dr. Kar Wai "Clara" Sze

Dr. Sze was a graduate student in Dr. Sathe's lab and worked in the lab in Room 442G from 1990 to 1996. She was diagnosed with **gallbladder cancer** in June 2017 at age 49 and died in February 2018. Gallbladder cancer is uncommon and accounts for 1% of all cancers. When gallbladder cancer is discovered at its earliest stages, the chance for a cure is very good. But most gallbladder cancers are discovered at a late stage when the prognosis is often very poor.

Lauren Ormsbee, Research Study Coordinator

Lauren has been Dr. Arjmandi's Research Study Coordinator since 2010. She worked in the lab in Room 442, but spent most of her time in the basement of the Sandels Building, where clinical studies took place. Lauren was diagnosed with thyroid disease in 2013, Persistent Postural Perceptual Dizziness in 2016 and Dermatofibrosarcoma protuberans (**DFSP**) in 2019 at age 38.

DFSP is a very rare type of skin cancer that begins in connective tissue cells in the middle layer of the skin (dermis). DFSP may at first appear as a bruise or a scar. As it grows, lumps of tissue (protuberans) may form near the surface of the skin. DFSP is estimated to occur in 1 in 100,000 to 1 in 1 million people per year. About 1,000 cases are diagnosed in the US each year.

Dr. Yitong Zhao, former Ph.D. student in Dr. Salazar's lab (room 442D)

Yitong was a Master's student in Dr. Arjmandi's lab from 2011 to 2014 and worked in his lab in Room 442. She then joined Dr. Salazar's lab and worked in her lab in Room 442D from 2014 to 2018. In 2017, she noticed a reddish and itchy patch of skin on her chest. She saw a doctor at the wellness center and was advised to monitor any changes in size and appearance. In 2021, she was diagnosed with **DFSP** at age 33. It is alarming that two young women working in the same area were diagnosed with this very rare condition.

Michael Ormsbee, Professor, Graduate Program Director and Director for the FSU Institute of Sports Sciences and Medicine (ISSM)

Dr. Ormsbee joined the department as an Assistant Professor of Exercise Physiology in 2010. His office is Room 430 in the Sandels Building, he regularly uses the basement labs, and he has taught in several classrooms in the building. His primary lab is now in the Institute of Sports Sciences and Medicine (ISSM) (since 2014). He was diagnosed with **Duodenal Follicular Lymphoma** in 2016 at age 36.

Follicular lymphoma, a common nodal lymphoma, is rare in the gastrointestinal tract. When seen in this location, duodenal involvement is frequent.

Angela Sehgal, Program Director Athletic Training Education and PHPLC.

Angela joined the department in 2001 and is a teaching faculty level 3. She was diagnosed with pre-skin cancer in Summer 2021 at age 54. She was also diagnosed with asthma, allergies, and chronic migraine headaches beginning in 2014. She mentioned that "while teaching remotely, I did not have to use any asthma/allergy medication or migraine medication". She was also treated for chest pain and difficulty breathing in 2019. She underwent a breathing test at TMH, which revealed a respiratory deficit.

E. Allergies and immune diseases

Several faculty and staff suffer from allergies and some from allergies and immune diseases. Many faculty members mentioned that their symptoms were alleviated when teaching remotely due to COVID-19. **Jennifer Farrell**, Program Director for Didactic Program in Dietetics and Undergraduate Coordinator, describes her symptoms and disease progression below (sent on January 5, 2022):

> *I am writing to express my concerns regarding my health and the Sandels Building. I began working at FSU in August 2005 and have had been in the same office, 410 Sandels Building.*
>
> *Over the years I developed allergies. Allergy testing revealed no common allergens. My allergies were not seasonal, but constant and progressively worsened. I was using Claritin, Zyrtec, prescription nasal spray and a prescription inhaler on a regular basis. My allergies provided a breeding ground for persistent sinus infections (one year I had five sinus infections) and ear infections. With my weakened immune system, I was susceptible to various colds and viruses. During the years when my health was at its worse, 2016-2019, I had strep throat at least once per year, and one year I had strep twice in a four-week period.*
> *In 2015 I began experiencing persistent fatigue and muscle pain even when "healthy". This led me to my primary care physician. I told her I was tired, always tired. I didn't matter how much I slept; I was always tired. I had to lay down on a mat in my office after I lectured because I was so tired. Taking a shower and getting dressed was so exhausting I had to lay down and rest before I could go to work. I could no longer grocery shop, cook dinner, or take care of my kids. And my body hurt. My skin, my muscles, my joints. I would wake up in the middle of the night crying because my body hurt. And a host of other symptoms. This began a series of tests, waiting for results, making a new appointment, referring to another doctor and so on.*
>
> *I was eventually diagnosed with Sjogren's and fibromyalgia in 2017. The symptoms of these flare, coming and going. Sometimes lasting weeks at a time. Unfortunately, there are very few treatments for either of these, particularly the symptoms of fatigue, pain, brain fog, inflammation. My advice from the doctors was to rest, "don't overdo it". Treatment to control other symptoms includes prescription mouthwash for the dry mouth, lots of over-the-counter saline solution for eyes and lip balm for dry lips.*
>
> *After we moved to virtual teaching and working from home. My autoimmune symptoms decreased significantly. I have had very few bouts of fatigue and pain. And if I do have a flare it may last a day or two and of mild severity, instead of seven to ten days of debilitating fatigue and pain. But even more revealing to me, my allergy symptoms have disappeared. I haven't used Claritin, Zyrtec, nasal spray or the inhaler since I have been working primarily from home. These symptoms disappeared quickly and entirely.*
>
> *I have been much healthier since we began working from home. Social distancing and mask protocols have decreased the transmission of all infections. But the one time I have been sick since March 2020, my body was able to recover in a few days instead of a week and a half. And it didn't transition into bronchitis. One could*

argue that a change in work location and therefore schedule would be beneficial to preventing autoimmune flares. But I see no other explanation for the sudden and definitive drop in allergy symptoms and sinus infections.

I am concerned about the amount time I spend in my office. I feel that my health has substantially improved since spending less time in my office.

Michele Garber, Assistant Department Chair and Associate Program Director Athletic Training and Health Professional Learning Community, experienced migraines and worsening symptoms of allergy reactions triggered by the time spent in the building.

Chronic cough and allergies were also experienced by former faculty members, including D. Abood and Dr. Moffatt (Table 1).

Dr. Bahram Arjmandi, Professor of Nutrition, former Department Chair and Director of the Center for Advancing Exercise and Nutrition Research on Aging, was diagnosed with the following conditions:

- Thyroid disease in 2008
- Heart attack and angioplasty in January 2018
- Autoimmune issues in January 2019, including chigger bites that became incurable

Chigger is the common name for species of the Trombiculid family of mites. Bites from the larva of these mites can cause local pruritus and irritation, formally known as trombiculiasis or trombiculosis.

F. Student's concerns

Finally, many graduate students have expressed their concerns about the unsafe conditions in the Sandels Building through personal communications with faculty. A Ph.D. student sent the following email to Dr. Ormsbee on January 24, 2022:

Hey Dr. Ormsbee,
I've talked to some of the other students, and we have some concerns about completing our exams in Sandels next week. While it's unsure if only 4 days will cause an issue, we would rather not take the risk. Is there a chance we would be able to complete our exams in a different building next week? Thank you!

The student gave permission to Dr. Ormsbee to share the message. The student identity will not be disclosed.

Accommodations were provided, and students were assigned to other buildings to take the preliminary exams. However, concerns persist. We fear that students will not be willing to do research in the Sandels Building, which may delay their graduation timeline.

In conclusion, faculty, staff and students have serious concerns related to the unsafe conditions of the Sandels Building. The faculty are disappointed that their repeated requests over the past twenty years have not been taken seriously enough to take action that may have saved lives and prevented serious diseases. Faculty from the Department of Human Development and Family Science, the former Department of Retail, Merchandising and Product Development and the staff from the Dean's Office also have serious concerns and are suffering from health problems.

Specific issues from faculty and staff from these departments as well as the staff from the Dean's Office are not included in this letter, but they do support this letter.

Acknowledgments

The following faculty and staff acknowledge that they have read and fully support the content of this document.

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Table 1. Timetable of Nutrition and Integrative Physiology Faculty and Their Diagnosed Diseases and Conditions on 4th Floor Sandels

Name	Year of Employment	Disease	Year Diagnosed (Age of Diagnosis)	Reports Made to Administration
CANCER (n=8)*				
Shri Sathe Lab 442G	1988	**Squamous Cell Carcinoma** on gum	October 2012 (62 yrs)	
		Buccal Mucosa on one cheek	October 2015 (65 yrs)	
		Cholangiocarcinoma (Bile Duct Cancer)[2]	February 2019 (69 yrs)	Died April 2019 (69 yrs)
Kar Wai "Clara Sze" Tao Doctoral Student of Dr. Shri Sathe who died of a similar cancer. Worked in Lab 442G	1990-1996	**Gallbladder Cancer** Metastasis to liver[3]	June 2017 (49 yrs)	Died February 2018 (50 yrs)
Yun-Hwa "Peggy" Hsieh Lab 423 and 442D	2003	Diagnosed by pulmonologists (TMH, UF Shands) to have acute atypical pneumonia, which occurred repeatedly in the following 5 years and continuing to suffer with uncured "Bronchiectasis" and "MAC (M. avium complex) pneumonia	August 2010 (61 yrs)	Reported twice to FSU Environmental Health and Safety regarding significant amount of dark particles falling on the countertop in the laboratory between 2005 and 2010.
		Diagnosed with an autoimmune disorder (Mixed Connective Tissue Disease).	November 2010 (61 yrs)	

		Diagnosed twice with **Neoplasm of connective tissue**	Feb 2015 Oct 2015 (66 yrs)	
		Diagnosed with **3 malignant mucosal melanomas** (Clark's level, at least III)	April 2016	
		Ascending aortic aneurysm Arteriosclerotic cardiovascular disease	Oct 2017 (68 yrs)	Retired, 2016
Jeong-Su Kim Lab Sandals 440 Office in 432 and now 100B	2006	Diagnosed with **stage 4 lung cancer (Epidermal growth factor receptor (EGFR)-positive lung cancer)**[1]	December 2020 (52 years)	
Michael Ormsbee Office 430	2010	**Duodenal Follicular Lymphoma**	2016 (36 yrs)	Yes
Lauren Ormsbee Research Assistant for Dr. Arjmandi's Lab 442 and basement. Office Sandels basement	2010	**Thyroid Disease**	2013 (32 yrs)	Multiple reports regarding condition of the basement (mold smell, black particles, wet carpet, wet walls, etc).
		Persistent Postural-Perceptual Dizziness (Vestibular Disorder)	2016 (35 yrs)	
		Dermatofibrosarcoma Protuberance (DFSP)[4]	November 2019 (38 yrs)	
Yitong Zhao Master student of Dr Ajmandi (442)	2011-2018	**DFSP**	December 2021 (33 yrs)	

Doctoral Student of Dr. Salazar (442D)				
Green T. Waggener Masters' student of Emily Haymes worked in basement	2000-2008	**Pancreatic Cancer**	Diagnosed (2019) and Died January 8, 2020 (67 yrs)	
AUTOIMMUNE (n=3)				
Yun-Hwa "Peggy" Hsieh	See above under cancer			
Jennifer Farrell Office Sandels 410	2005	Sjogren's Syndrome[5] Fibromyalgia Persistent Allergies	Symptoms started in 2015. Diagnosed in 2016/2017 with Sjogren's	

Bahram Arjmandi Lab 442 Moved into Robert Moffatt's office after he retired in 2019 office 406	2006	Autoimmune issues – chigger bites which were not curable and still is having problems. Systemic reaction all over lower legs. Heart attack and angioplasty. Thyroid Disease	2019 2018 2008	
ALLERGIES PNEUMONIA (n=7)				
Yun-Hwa "Peggy" Hsieh	See above under cancer			

Jennifer Farrell	See above under autoimmune			
Doris Abood Office Sandels 408	2000	Chronic cough	Cough got worse over the years until retirement in 2012.	Contacted the environmental office at FSU when her now chronic cough started. Thinking it was mold intrusion especially after Bob Moffatt discovered mold in his office behind his bookcase, she asked for an assessment. Was told "there's no threshold for mold above which it becomes a health hazard". She has never been the same and thinks the only thing that "saved" her was keeping windows open as much as possible. Retired 2012
Robert Moffatt Office 406		Allergies Chronic Cough	Moved to office from Chair position, after one month saw mold on top of built-in shelves under windows. Lots of sneezing, coughing and congestion during that time. Removed shelving and sneezing coughing lessened. Used that office until day of retirement. Continue to have	Retired 2019

			persistent allergies and congestion to this day.	
Michele Garber Office 424	2003	Migraines Triggered allergy reactions - cough, burning eyes, running nose. Symptoms triggered by time spent in the office.	Symptoms started when she was relocated back to this building in 2014 (48 yrs)	Reported problems of black particles in my office several times to College Administration
Angela Sehgal Office 422	2001	Diagnosed with asthma, allergies, and chronic migraine headaches since 2014. During the summer of 2021, diagnosed with pre-skin cancer. While teaching remotely, she did not have to use any asthma/allergy medication or migraine medication.	2014 (43 yrs) 2021 (54 yrs)	Reported several times to FSU Environmental Health and Safety and the College of Health and Human Sciences regarding a significant amount of dark particles falling on her desk in her office (Room s422).
Dan Machin BRF building	2020	Allergies, exercise-induced bronchoconstriction (EIB), and esophageal dysphagia	2021 (36 yrs)	No major issues with allergies, EIB, or dysphagia while teaching remotely in 2020. Taught in Sandels 103 in Fall 2021. Multiple (30+) bouts of EIB requiring albuterol inhaler for relief during Fall 2021. Multiple bouts (10+) of dysphagia during Fall 2021. These issues had not been present since ending class in Sandels. Immediately, following a faculty meeting a few

				weeks after classes ended, both EIB and dysphagia recurred.

*Some individuals have been diagnosed with multiple conditions along with their cancers so the "n" values will be higher than the number of individuals in the table.

[1]EGFR-positive lung cancer refers to lung cancers that show evidence of an EGFR mutation. EGFR, or epidermal growth factor receptor, is a protein present on the surface of both healthy cells and cancer cells. When damaged, as can occur in some lung cancer cells, EGFR doesn't perform the way it should. Instead, it causes rapid cell growth, helping the cancer spread. Risk factors include air pollution exposure and occupational exposures (https://www.healthline.com/health/lung-cancer/egfr-mutation-lung-cancer#risk-factors)

[2]Cholangiocarcinoma (bile duct cancer) is a deadly disease. Even when it is detected early, the five-year survival rates for people with this cancer is less than 25%.

[3]Gallbladder cancer is uncommon. When gallbladder cancer is discovered at its earliest stages, the chance for a cure is very good. But most gallbladder cancers are discovered at a late stage, when the prognosis is often very poor.

[4]Dermatofibrosarcoma protuberans (DFSP) is a very rare type of skin cancer that begins in connective tissue cells in the middle layer of your skin (dermis). Dermatofibrosarcoma protuberans may at first appear as a bruise or scar. As it grows, lumps of tissue (protuberans) may form near the surface of the skin. Dermatofibrosarcoma protuberans is estimated to occur in 1 in 100,000 to 1 in 1 million people per year. Two young women working in the same area diagnosed with this condition.

[5]Sjögren's is a systemic autoimmune disease that affects the entire body. Along with symptoms of extensive dryness, other serious complications include profound fatigue, chronic pain, major organ involvement, neuropathies, and lymphomas.

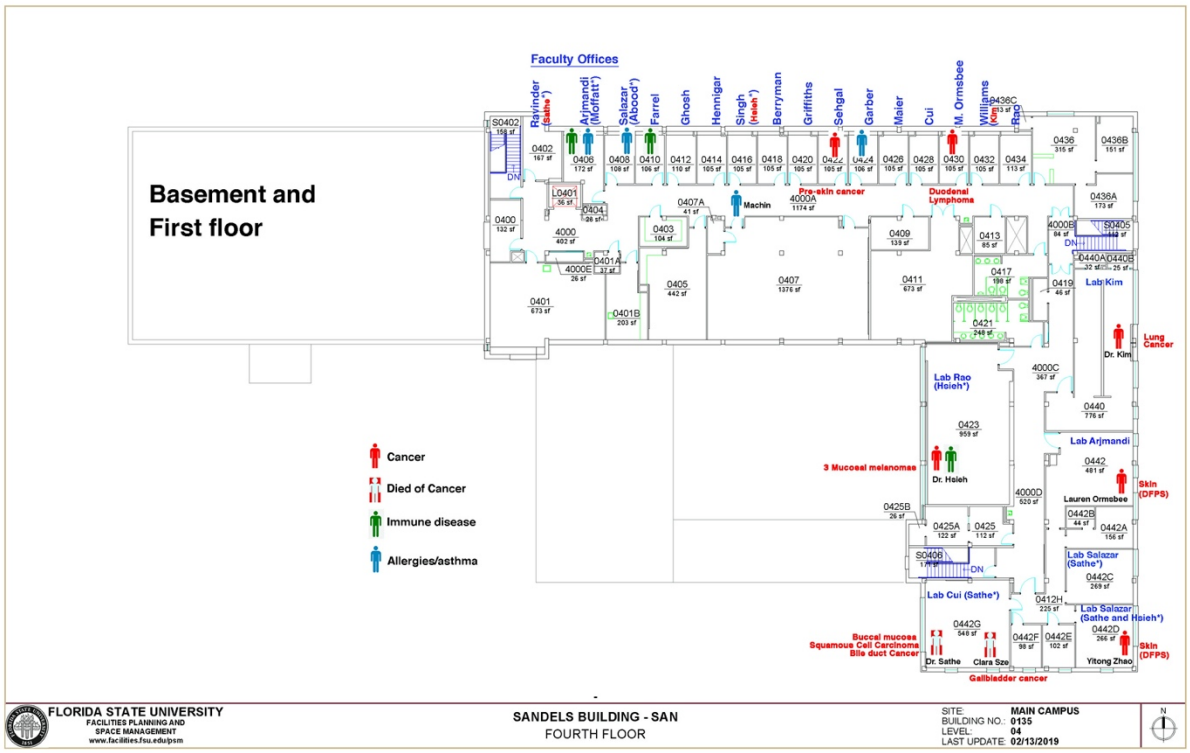

Figure 1. Floor plan of the 4th floor of Sandels Building showing cancer, allergies and immune disease cases. The map shows a cluster of cancer cases (red) in the east wing of the 4th floor of the building. The red shaded figure ( ) denotes colleagues that have died from cancer in room 442G. People suffering from allergies (blue) and immune diseases (green) are also shown. The symbol (*) denotes lab and offices occupied by former PIs.

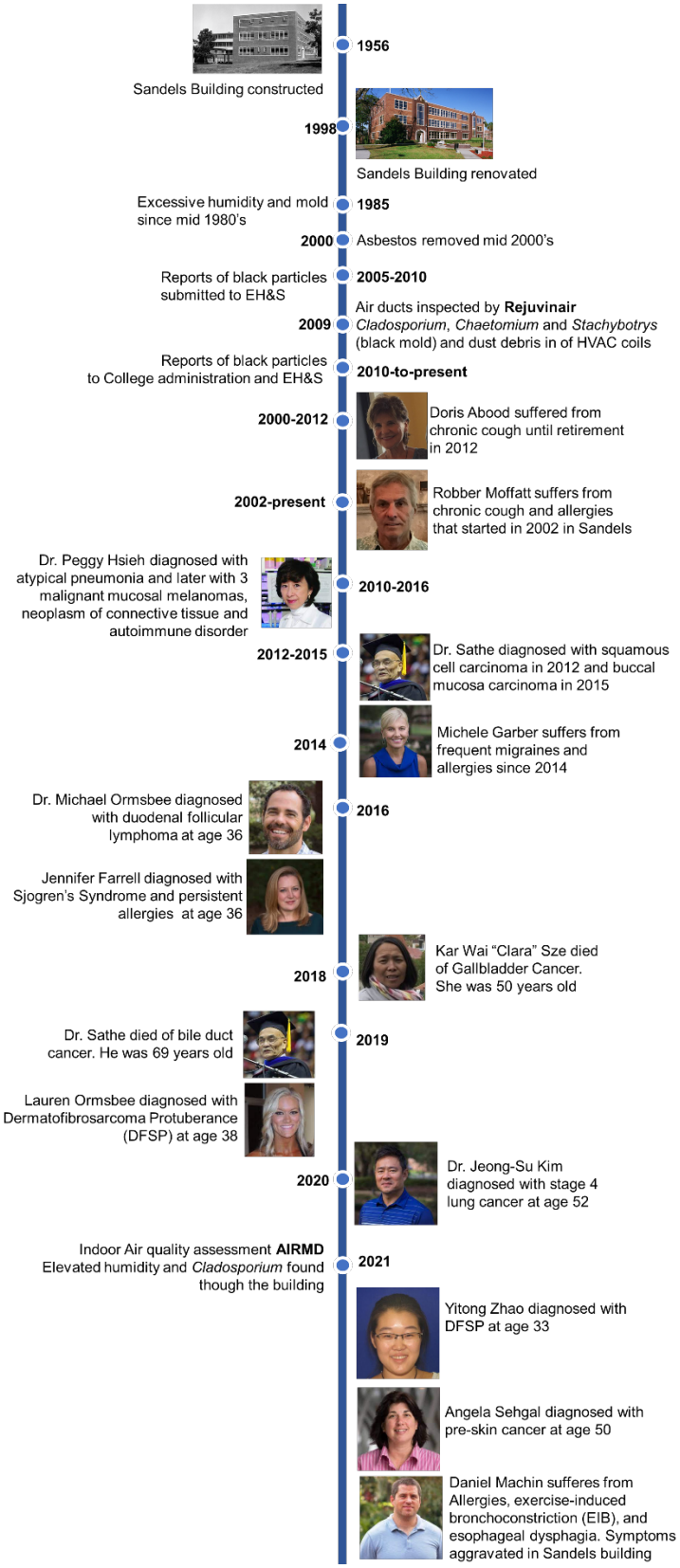

Figure 2. Timeline of major disease cases and air quality assessments. The air quality was assessed by Rejuvinair in 2009 and by AIRMD in 2021.

Figure 3. Air filters taken from Dr. Salazar's lab in rooms 442C and 442D. Pictures were taken on September 6, 2021 before the cleaning of the air ventilation system started in September 7, 2021. Pictures of the filters in rooms 442D and 442C show the blackened filter paper and black particles of diverse sizes.

Figure 4. Example of black particles found on surfaces in the Sandels Building. Pictures were taken on September 7, 2021 the day when the cleaning of the air ventilation system started. Pictures show the black particles found on top of benches and equipment in Dr. Kim's lab in Room 440.

Figure 5. **Air filters taken from in Dr. Kim's lab in Room 440**. Black particles and blackened paper found on filter covering air vents in Dr. Kim's lab. A) Pictures taken before the filter was removed. B) Pictures comparing the appearance of the filter taken from the lab (bottom) and a new filter (top). The pictures were taken September 7, 2021.

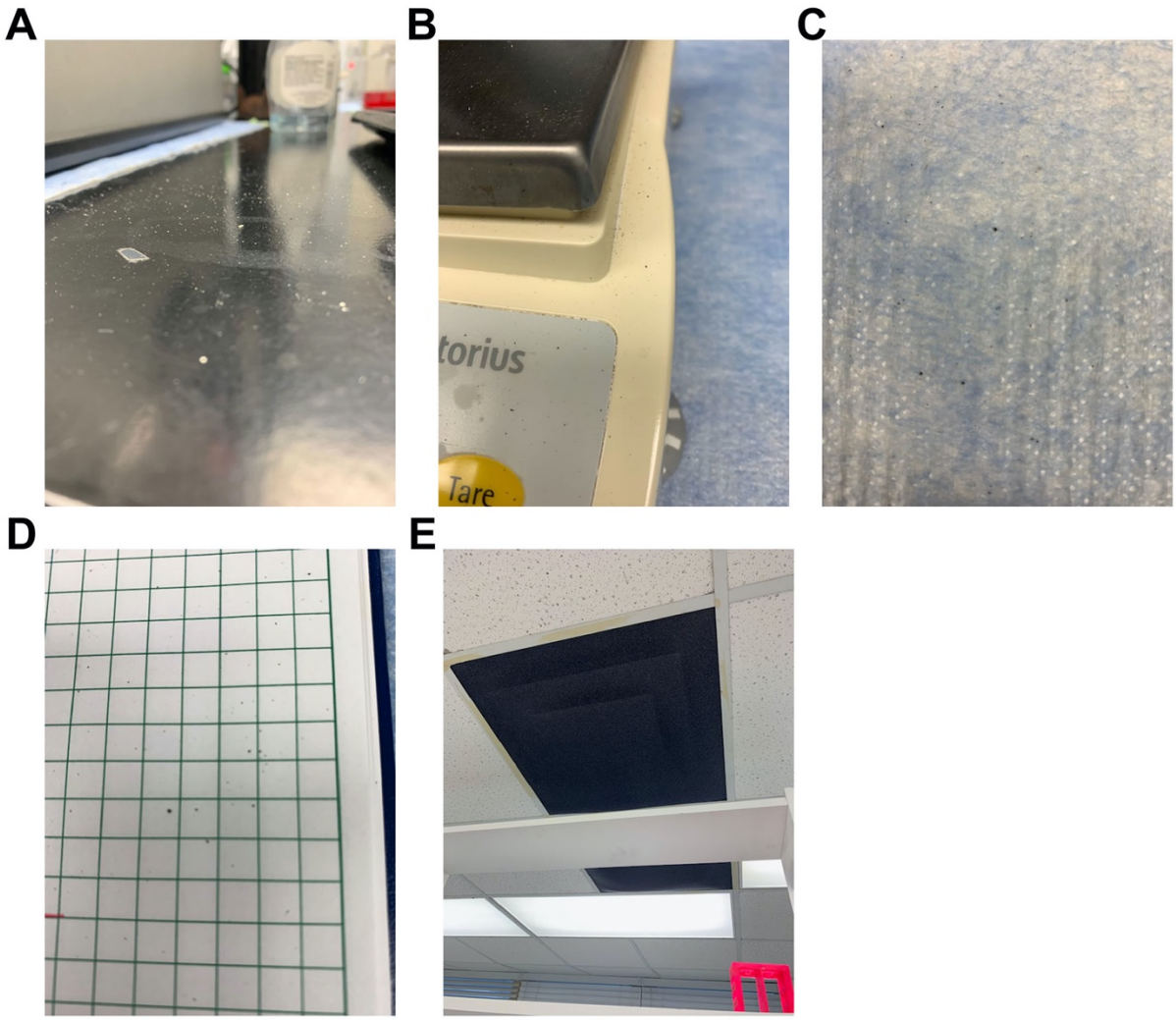

Figure 6. Dr. Salazar's lab in Room 422D after 4 months of air ventilation cleaning. Pictures taken January 16, 2022, 4 months after the cleaning began show debris and fine black particles in benches (A), equipment (B), bench pads (C) and in a lab notebook (D) that was left opened overnight. The lab was meticulously cleaned and new bench pads placed a week before the pictures were taken. Particles accumulated even when air vents were covered (E).

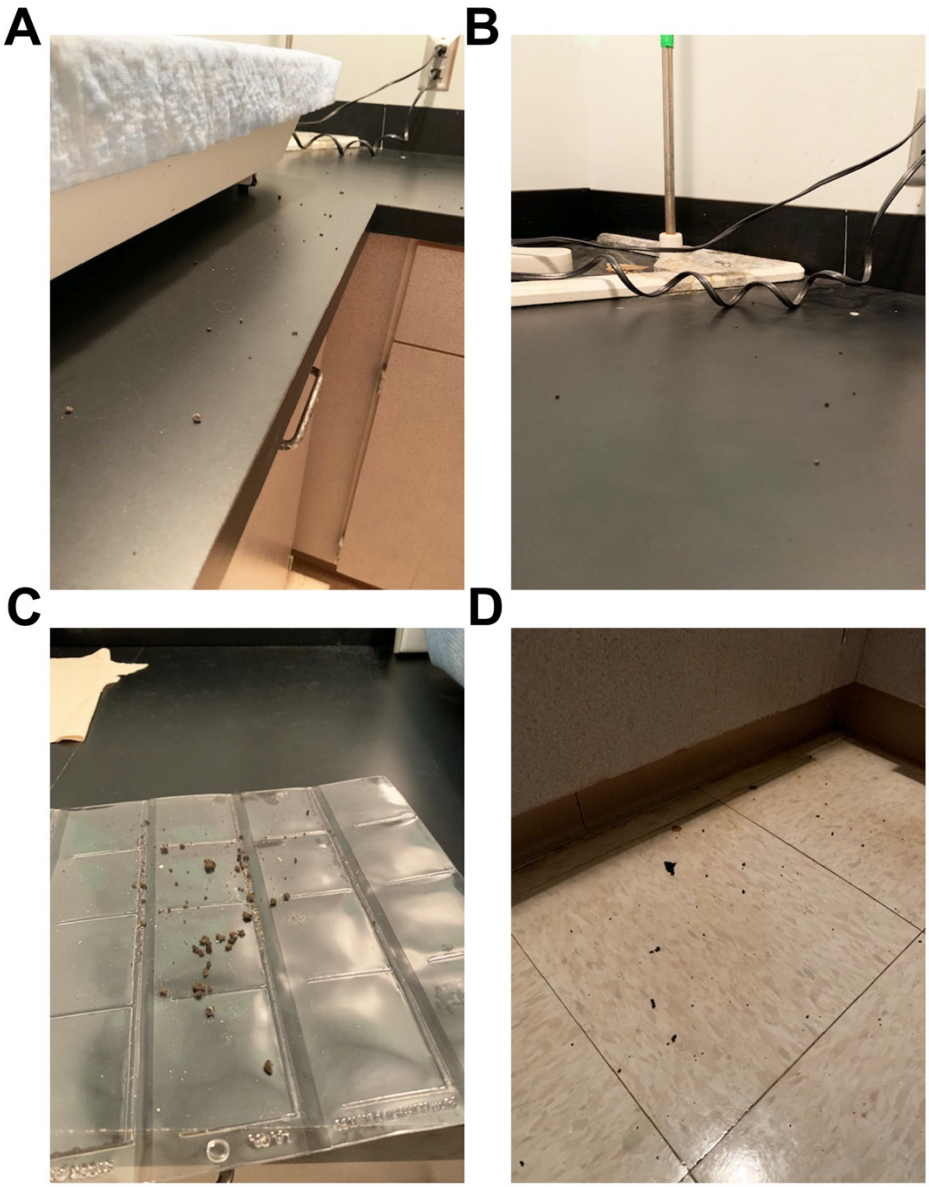

Figure 7. Dark room 422A after 4 months of cleaning. Pictures taken January 4, 2022, four months after the cleaning began show big chunks of black debris and fine black particles in benches (A and B). Particles from the benches were collected and are shown in C. Big black chunks also can be seen on the floor.

Figure 8. Dr. Kim's office in room 100B at Sandels building. Pictures taken January 11, 2022 show black particles of different sizes on top of Dr. Kim's desk.

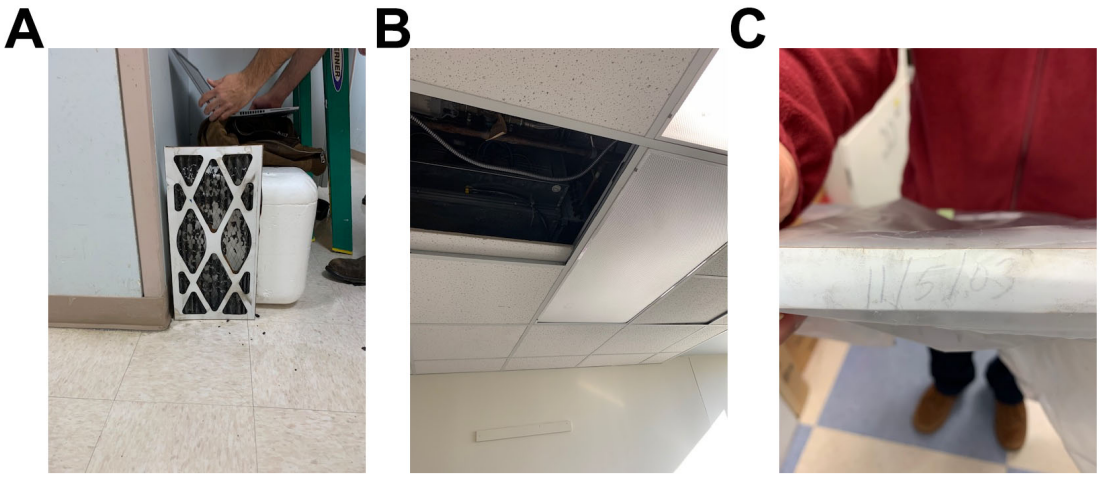

Figure 9. Old filter found in Dr. Salazar's lab room 442C. Pictures were taken January 18, 2022 and show a filter covered in black material (A) that was removed from the ceiling in room 442C (B). The filter hasn't been changed since November 5, 2003 (C).

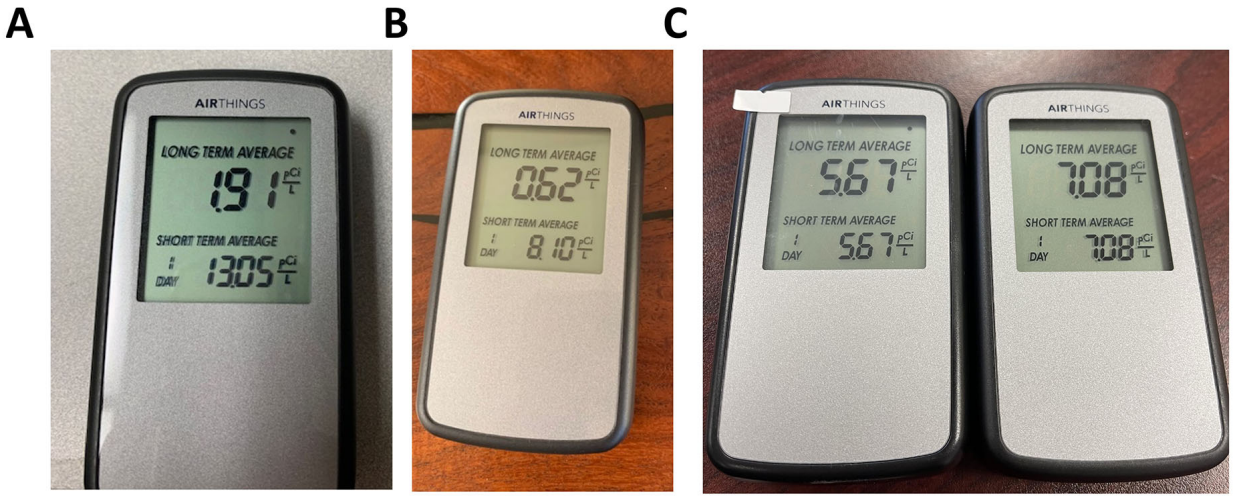

Figure 10. Elevated radon levels in ground floors in Sandels building. Pictures of radon meters placed in A) the basement (room B0007A), B) the Dean's office (room 242L), and C) Marian Sumner's office (room 242I) and room 242M. The number in the top reflects the long-term average. Current readings are reflected in the short-term average in the lower part of the screen. In C meters were reset to zero before measurements.

Figure 11. Room 442E Sandels building. Pictures show the condition of the wall where the chemical hood in room 442E was placed. Marks of a yellow liquid are a testimony of what was present inside of the hood.

Figure 12. Chemical hood in Room 442G. Example of debris found in the chemical hood located in Room 442G, previously occupied by Dr. Sathe and currently assigned to Dr. Cui. Debris is constantly found inside the hood.

Appendix 1

Report of air quality assessment by Rujuvinair

May 14, 2009

ARTHUR V. MARTIN
ASSOCIATES INC
The Air Quality Consultants

5/14/09

Richard Namovich
President/CEO
Rejuvinair
4852 Pimlico Dr.
Tallahassee, FL 32309
Re: IAQ testing: Florida State University. Sandels Building

Mr. Namovich:

Please take note to the following: Laboratory results from an independent, certified microbiological lab show that there is a definite issue with mold growth throughout the majority of the HVAC coils tested. *Cladosporium, Chaetomium,* and *Stachybotrys* were all identified. All of these species can be problematic and detrimental to an individual's health.

Of particular note, the air sample taken on the first floor of the Sandels building detected the presence of the species *Chaetomium* at an airborne concentration level of 600 spores/cubic meter of air. To put that in perspective, the "high" average for **outdoor** levels at this time of year in FSU's zip code begins at 110 spores/cubic meter of year. The World Health Organization states that "pathogenic and toxigenic fungi are not acceptable in indoor air… at levels that are over 100/m^3 above the outdoor air's concentration." *Chaetomium* does have potential toxin production by some of its subspecies.

By no coincidence, this particular species of mold was found to exist on several of the sampled HVAC coils in this building. This is a clear indication that those coils are presenting the conditions for mold to grow, and the HVAC system's ductwork is acting as the transport mechanism. Air samples on the other floors did not show elevated levels, however, the species that were identified do reflect the same ones found on the HVAC coils. If a proper cleaning of these coils is not performed, the conditions we see on the first floor may become common to the other floors. Safe and healthy indoor air quality cannot be maintained without appropriately sanitized HVAC systems.

It is also important to note that the species *Stachybotrys* was found in the air sample taken from the first floor of Sandels, and low levels were detected on 2 of the HVAC coils. This is a serious concern. *Stachybotrys* is the notorious species referred to as "black mold" or "toxic mold" (although several species of mold have toxicity and all species are black at some point in their growth process). It is a large and sticky mold spore that is water-based, which means it is difficult to become airborne. These spores are not normally found in indoor air even if a large mold reservoir is present **unless** it is being disturbed, for example, by incompetent demolition/cleaning, or being transported by means of HVAC ductwork. *Stachybotrys* should not be detected in indoor air samples at all in a healthy building.

Concerning the 1st floor of this building: supplemental data found in the "Moldstat" report illustrates that it is statistically/mathematically improbable that the airborne mold found in that sample originates from an outdoor source. This is more proof that the HVAC system is the main source.

All samples taken from the HVAC coils were discovered to contain high to very-high concentration levels of non-viable materials such as dust, dirt, hyphal fragments, pollen, skin cells, etc. This presents another issue. The buildup of both non-viable and viable material such as fungi, bacteria, dirt, dust, grime, etc. acts as an insulator on the heat transfer surfaces of the HVAC system. It retards proper cooling. This results in a direct increase in energy consumption which results in increased operating costs. An additional detriment is that it shortens the usable life of the equipment resulting in early replacement. This combination of non-viable and viable buildup of bioaerosols leads to poor air quality and the potential for occupant illness due to inhalation and respiration of these particles.

All laboratory reports and photo documentation are included with this document. Please contact me if you have any further questions. Thank you.

Respectfully,

Kevin Martin

Kevin Martin
Vice President
Arthur V. Martin Associates, Inc.

EMLab P&K
1150 Bayhill Drive, Suite 100, San Bruno, CA 94066
(866) 888-6653 Fax (650) 829-5852 www.emlab.com

Client: Arthur V. Martin Associates
C/O: Mr. Kevin Martin
Re: Sandels

Date of Sampling: 05-11-2009
Date of Receipt: 05-12-2009
Date of Report: 05-26-2009

SPORE TRAP REPORT: NON-VIABLE METHODOLOGY

Location:	14929542: Outdoor		14929614: Sandels , 1st floor		14929587: Sandels , 2nd floor		14929543: Sandels , 3rd floor		14929565: Sandels , 4th floor	
Comments (see below)	None		None		None		None		None	
Lab ID-Version‡:	2398744-1		2398745-1		2398746-1		2398747-1		2398748-1	
	raw ct.	spores/m3	raw ct.	spores/m3	raw ct.	spores/m3	raw ct.	spores/m3	raw ct.	spores/m3
Alternaria	3	40								
Arthrinium										
Ascospores*	2	110								
Aureobasidium										
Basidiospores*			2	110	3	160	3	160		
Bipolaris/Drechslera group										
Botrytis										
Chaetomium			45	600	2	27				
Cladosporium	6	320	1	53			5	270	1	53
Curvularia					1	13				
Epicoccum										
Fusarium										
Myrothecium										
Nigrospora										
Oidium	2	27								
Other brown			2	27						
Penicillium/Aspergillus types†					2	110	1	53		
Pithomyces										
Rusts*										
Smuts*, Periconia, Myxomycetes*	2	27	1	13			1	13	2	27
Stachybotrys			4	53						
Stemphylium										
Torula										
Ulocladium										
Zygomycetes										
Background debris (1-4+)††	3+		3+		2+		3+		2+	
Hyphal fragments/m3	13		1,300		13		< 13		13	
Pollen/m3	< 13		27		< 13		< 13		< 13	
Skin cells (1-4+)	< 1+		1+		1+		1+		1+	
Sample volume (liters)	75		75		75		75		75	
§ TOTAL SPORE/m3		520		850		310		490		80

Comments:

* Most of these spore types are not seen with culturable methods (Andersen sampling), although some may appear as non-sporulating fungi. Most of the basidiospores are "mushroom" spores while the rusts and smuts are plant pathogens.
† The spores of *Aspergillus* and *Penicillium* (and others such as *Acremonium, Paecilomyces*) are small and round with very few distinguishing characteristics. They cannot be differentiated by non-viable sampling methods. Also, some species with very small spores are easily missed, and may be undercounted.
††Background debris indicates the amount of non-biological particulate matter present on the trace (dust in the air) and the resulting visibility for the analyst. It is rated from 1+ (low) to 4+ (high). Counts from areas with 4+ background debris should be regarded as minimal counts and may be higher then reported. It is important to account for samples volumes when evaluating dust levels.
The Limit of Detection is the product of a raw count of 1 and 100 divided by the percent read. The analytical sensitivity (counts/m3) is the product of the Limit of Detection and 1000 divided by the sample volume.
‡ A "Version" greater than 1 indicates amended data.
§ Total Spores/m3 has been rounded to two significant figures to reflect analytical precision.
TestAmerica Environmental Microbiology Laboratory, Inc.

EMLab P&K
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(866) 888-6653 Fax (650) 829-5852 www.emlab.com

Client: Arthur V. Martin Associates
C/O: Mr. Kevin Martin
Re: Sandels

Date of Sampling: 05-11-2009
Date of Receipt: 05-12-2009
Date of Report: 05-26-2009

DIRECT MICROSCOPIC EXAMINATION REPORT
(Wet Mount)

Background Debris and/or Description	Miscellaneous Spores Present*	MOLD GROWTH: Molds seen with underlying mycelial and/or sporulating structures†	Other Comments††	General Impression
Lab ID-Version‡: 2398733-1: Swab sample SW1: (SA) AHU 1A				
Heavy	Variety	1+ *Cladosporium* species	None	Mold growth
Lab ID-Version: 2398734-1: Swab sample SW2: (SA) AHU 1B				
Moderate	Few	2+ *Chaetomium* species	None	Mold growth
Lab ID-Version: 2398735-1: Swab sample SW3: (SA) AHU 2B				
Very Heavy	Variety	1+ *Cladosporium* species	None	Mold growth
Lab ID-Version: 2398736-1: Swab sample SW4: (SA) AHU 3A				
Heavy	Few	1+ *Chaetomium* species	A few *Stachybotrys* spores detected.	Mold growth
Lab ID-Version: 2398737-1: Swab sample SW5: (SA) AHU 3B				
Heavy	Few	None	A few *Stachybotrys* and *Chaetomium* spores detected.	Mold growth in vicinity?
Lab ID-Version: 2398738-1: Swab sample SW6: (SA) AHU 4A				
Heavy	Few	1+ *Chaetomium* species	None	Mold growth
Lab ID-Version: 2398739-1: Swab sample SW7: (SA) AHU 4B				
Heavy	Few	1+ *Cladosporium* species 1+ *Chaetomium* species	None	Mold growth
Lab ID-Version: 2398740-1: Swab sample SW8: (SA) AHU 5				
Very Heavy	Few	1+ *Cladosporium* species < 1+ *Chaetomium* species	None	Mold growth

Background Debris and/or Description	Miscellaneous Spores Present*	MOLD GROWTH: Molds seen with underlying mycelial and/or sporulating structures†	Other Comments††	General Impression
Lab ID-Version‡: 2398741-1: Swab sample SW9: (SA) AHU 6				
Very Heavy	Few	None	None	Normal trapping

* Indicative of normal conditions, i.e. seen on surfaces everywhere. Includes basidiospores (mushroom spores), myxomycetes, plant pathogens such as ascospores, rusts and smuts, and a mix of saprophytic genera with no particular spore type predominating. Distribution of spore types seen mirrors that usually seen outdoors.

† Quantities of molds seen growing are listed in the MOLD GROWTH column and are graded 1+ to 4+, with 4+ denoting the highest numbers.

†† Some comments may refer to the following: Most surfaces collect a mix of spores which are normally present in the outdoor environment. At times it is possible to note a skewing of the distribution of spore types, and also to note "marker" genera which may indicate indoor mold growth. Marker genera are those spore types which are present normally in very small numbers, but which multiply indoors when conditions are favorable for growth.

‡ A "Version" greater than 1 indicates amended data.

Appendix 2

Report of air quality assessment by AIRMD

August 11, 2021

Nationwide Locations
Locally Served

Corporate Headquarters:
7700 Congress Avenue
Suite 1119
Boca Raton, FL 33487

AIRMD®
ENVIRONMENTAL CONSULTANTS

Indoor Air Quality Assessment

Project Location:
Florida State University – Sandels Building
675 West Call Street,
Tallahassee, FL 32304

Purchase Order:
FS22001764

Prepared For:
Florida State University
675 West Call Street,
Tallahassee, FL 32304

Date: 8/11/21

AIRMD®
ENVIRONMENTAL CONSULTANTS

Table of Contents

1.0 Executive Summary

AirMD is providing assessment results to the client for the above referenced project. AirMD's objective was to conduct an indoor fungal assessment of the property. The project was requested as a result of reported occupant concerns regarding the indoor air quality following the discovery of excess dust and debris that is found on the surfaces throughout the building. A site assessment was completed on July 28, 2021. The site visit assessed the visible accessible areas of the property that was agreed with the client and collected samples and measurements. The information provided in this report is based upon the agreed scope relative to the reported issue(s)/claim and include the entire property.

At the time of assessment, elevated moisture was detected on the exterior walls in rooms 242-I and 242-F. The condition(s) suggest moisture intrusion pathways may exist through the building envelope allowing for potential moisture exposure to interior building components. Moisture control is fundamental to the proper functioning of any building. Controlling moisture is important to protect occupants from adverse health effects and to protect the building, its mechanical systems, and its contents from physical damage and to prevent mold growth. It is recommended to contact a qualified licensed engineer or certified general contractor to correct the moisture intrusion issues. It is recommended to contact a qualified licensed engineer or certified general contractor to correct the moisture intrusion issues.

Dust and debris was present on the surfaces throughout the assessed areas. It was reported that this occurs often and is cleaned up regularly. Bio-aerosol sampling conducted identified elevated fungal quantities belonging to Cladosposium sp. in rooms 214 and 300A in the ambient air. As no known cause was identified, evaluate the air conditioning systems to identify if it is a contributory source. If it is a contributory source, the system should be cleaned in accordance with NADCA standards. If it is not a contributory source, invasive testing should occur prior to commencement of work. Assessment should be completed by an Air Systems Cleaning Specialist (ASCS), Certified Ventilation Inspector (CVI), or equivalent, to determine the preliminary state of HVAC system cleanliness and condition of the ductwork.

Prior to commencing remediation, all issues should be identified and corrected. Containment is required in the rooms 214, 242-I, 242-F and 300-A.

2.0 Introduction

The subject property is a university building of concrete construction with a flat roof system. In the areas assessed, split system air conditioner(s) serve the structure and the interior walls are gypsum board while the ceilings are a combination of gypsum board and concrete. AirMD was retained to conduct an assessment of the property based on reported occupant concerns regarding the indoor air quality following the discovery of excess dust and debris that is found on the surfaces throughout the building. The agreed scope of work includes a non-invasive assessment of the entire property relative to the reported issue(s)/claim.

Note, the site assessment did not include invasive testing and was specific to the scope of work described previously. Hidden areas of mold growth and other environmental issues may exist, and areas of damage not related to the reported issue(s)/claim may also exist and are not covered under this scope of work.

The purpose of the report is to detail the observations and findings and to present corrective measures if required based on the findings. It is very important that the necessary time be taken to read the report in its entirety.

3.0 Methodology

Project planning, development and execution was conducted in general accordance and consistent with the ASTM D7338-10 Standard Guide for Assessment of Fungal Growth in Buildings, guidelines published by the American Industrial Hygiene Association (AIHA) in Recognition, Evaluation, and Control of Indoor Mold and guidelines published by the American Conference of Governmental Industrial Hygienists (ACGIH) in Bioaerosols Assessment and Control. A full list of reference materials is listed in the Appendix section of this report. AirMD performed the following scope of work and sampling plan pursuant to discussions with the client(s) which included the following:

- Conduct a visual assessment of the accessible areas for the presence of water damage, water stains, moisture intrusion sources and fungal (mold) growth.

- Measure ambient temperature, relative humidity and dew point and compare to recommended industry guidelines to determine their effect on thermal comfort and supporting conditions for mold growth. Measurements are collected using a hygrothermometer which uses a precision capacitance sensor for measurement.

- Conduct moisture mapping of accessible building materials to identify whether the moisture equivalent values of the materials tested would be deemed elevated, suggesting exposure to moisture. Measurements are collected using a GE Protimeter Surveymaster moisture meter which has two modes, a search mode and a measure mode. In search mode, the moisture meter acts as a moisture detector providing readings in relative terms regarding the moisture condition beneath the surface. In measure mode, the moisture meter uses electrical conductance to measure the moisture level of the material between two electrodes. Calibration is completed using the manufacturers field pin calibration device.

- Utilize FLIR infrared camera to show temperature differentials and thermal patterns.

- Collect nine air samples using a calibrated sampling pump and slit impactor cassettes containing a sticky acrylic matrix to trap particulate matter from the ambient air. The total sample volume was 75 liters of air for each sample. eight indoor sample(s) and an outdoor comparison sample were collected.

- Collect three surface swab sample(s) to assess the fungal (mold) presence from surfaces sampled. Samples are collected using collection swabs. The sample areas for each location is approximately 5 square centimeters. Swabs have a fibrous tip and sample collection included placing the swab tip onto the surface to remove any fungal structures that may be present. The swab is placed into a holding tube which contains a transport medium.

- Collect one composite sample to identify if asbestos is present in the dust collected from the surfaces sampled. Samples were collected for analysis by Polarized Light Microscopy (PLM).

- Submit samples under chain of custody for analysis to AEML located in Pompano Beach, FL who is accredited for fungal identification analysis through the American Association for Laboratory Accreditation (A2LA). The laboratory analyzed the samples using Brightfield Microscopy.

- Submit samples under chain of custody for analysis to CA Labs located in Carrollton, TX who is accredited for asbestos fiber analysis through successful participation in the NIST National Voluntary Laboratory Accreditation Program (NVLAP) meeting the requirements of 40 CFR, Part 763.87, Volume 52, and Number 210.

- Interpret the analytical results and compare the results to the comparison samples collected and reference data points.
- Provide a written summary of results report.

4.0 Findings

The observations and findings documented below identify the issues present in each location. They are followed by recommendations for corrective measures that should be implemented.

Observations and Findings:

The visual assessment conducted includes observations of the visible portions of the property consistent with the scope of work. The visual assessment was completed to identify and document visible evidence of mold growth, water damage and/or water intrusion. The visual assessment also allows documentation of the extent of any issues so remedial actions can occur. For the purpose of this report, the front of the property faces east.

Room 401-B and Room 442-G:

- Visible dust and debris were observed on the air conditioner return and supply registers.

Recommendations:

- HEPA vacuum and damp wipe the affected air conditioner return and supply registers.

Rooms 214 and 300A:

- Bio-aerosol sampling identified atypical fungal quantities belonging to Cladosporium sp. in the ambient air.

Recommendations:

- HEPA vacuum and damp wipe all surfaces within the rooms. The carpets present should be cleaned in accordance with the IICRC S520. As directed in the standard most cleaning processes should begin and end with HEPA vacuuming. If concerns exist regarding the effectiveness of HEPA vacuuming, the carpet should be professionally cleaned in accordance with the IICRC S300 *"Standard and Reference Guide for Professional Upholstery Cleaning"*.

Room 242-I:

- Elevated moisture was detected in the exterior north wall.

Recommendations:

- Remove the affected wall. The area of removal measures approximately twelve linear feet and extends eight feet up from the floor. Visually assess the remaining gypsum board for mold growth. In the event that mold growth is observed, remove the affected materials approximately two feet in all directions beyond the edge of growth.

Room 242-F:

- Elevated moisture was detected in the exterior north wall.

Recommendations:

- Remove the affected exterior wall. The area of removal measures approximately two linear feet and extends two feet up from the floor. Visually assess the remaining gypsum board for mold growth. In the event that mold growth is observed, remove the affected materials approximately two feet in all directions beyond the edge of growth.

5.0 Sampling and Measurements

Water/Moisture Intrusion

Controlling moisture is extremely important in the function of any building. Moisture control is important to protect the building components and to protect occupants from adverse health effects from negative conditions because of moisture intrusion.

Moisture problems in residential and commercial properties are commonplace. Many common moisture problems in these properties can be traced to poor decisions in design, construction, and/or maintenance. Elevated moisture in building materials in a property can indicate for example, that plumbing leaks and/or water intrusion from outside sources is occurring. Elevated moisture in building materials can cause property damage and provide favorable conditions for fungal (mold) growth. Moisture mapping the property can identify problem areas.

Moisture mapping was conducted in limited areas throughout the property using a GE Protimeter Surveymaster moisture meter. The meter has two modes, a search mode and a measure mode. In search mode, the moisture meter acts as a moisture detector providing readings in relative terms regarding the moisture condition beneath the surface. It is a useful method to indicate moisture in a substrate.

In measure mode, the moisture meter uses electrical conductance to measure the moisture level of the material between two electrodes. The moisture measurements should not be interpreted as exact moisture content measurements of a material but should be interpreted as the Moisture Equivalent of the material at the time of measurement. Where elevated moisture is detected, it indicates a measurement of 20-99.9% while 17-19.9% is considered borderline. Elevated moisture was detected in some of the building materials.

Moisture Measurement %						
Location	**North**	**South**	**East**	**West**	**Ceiling**	**Floor**
Room 214	9	11	8	13	9	9
Room 242D	12	8	10	9	10	10
Room 242E	10	14	9	10	10	10
Room 242F	21	11	8	8	11	10
Room 242G	10	10	12	8	8	9
Room 242I	53	10	13	11	8	10
Room 242J	14	11	9	12	10	8
Room 300A	8	13		10	8	10
Room 401-B	12	11	14	11	10	NA

Moisture Measurement %						
Location	**North**	**South**	**East**	**West**	**Ceiling**	**Floor**
Room 430	10	13	10	12	9	9
Room 440	8	10	13	11	13	NA
Room 442A	8	-	9	8	10	NA
Room 442G	13	8	8	9	11	NA

Temperature/Relative Humidity/Dew Point Measurements

Indoor temperatures in a property can play a role in thermal comfort, occupant satisfaction with the space, and influence indoor air quality. Relative humidity in general terms is how moist the air is. It is defined as the ratio of the water vapor density (mass per unit volume) to the saturation water vapor density, usually expressed in percent. Elevated humidity indoors can provide favorable conditions for fungal (mold) growth.

Dew point is a predictive measure that indicates the temperature at which moisture in the air will reach 100% and condense onto a surface. It can be a useful measure for controlling moisture levels to avoid fungal (mold) growth because it is usually very easy to determine the temperature of the coldest surfaces within a property. To ensure high moisture levels or condensation does not occur on those surfaces, dew point levels in the air should be controlled in the building to below the temperature of the coldest surfaces in a space.

Temperature, relative humidity and dew-point measurements were recorded using a hygrothermometer and the measurements were compared to ASHRAE (American Society for Heating, refrigerating, Air Conditioning Engineers) standards. The instrument uses a precision capacitance sensor for measurement. Prior to use, bi-annual calibration checks are completed inhouse on the thermohygrometers as part of quality control procedures using a primary standard as well as an annual independent third-party calibration check.

The temperature measurements recorded in the property at the time of our visit were in all areas within the typical range suggested by the ANSI/ASHRAE Standard 55-2013: Thermal Environmental Conditions for Human Occupancy which specifies the combinations of indoor environmental and personal factors that produce acceptable thermal conditions to a majority of occupants within a space. Assuming slow air movement (less than 40 feet per minute) and 50% indoor relative humidity, the operative temperatures recommended by ASHRAE range from 68.5°F to 75°F in the winter, and from 75°F to 80.5°F in the summer.

The relative humidity measurements recorded in the property at the time of our visit were in all areas below 60%. Indoor relative humidity in the 30 to 60 percent range is the most acceptable for comfort. It is recommended by the U.S Environmental Protection Agency (E.P.A) and the American Conference of Governmental Industrial Hygienists (ACGIH) to keep humidity below 60% as a mold preventative measure.

The table below documents the ambient temperature, relative humidity and dew point measurements recorded in the property at the time of assessment.

Location	Temperature °F	Humidity %	Dew Point °F
Room 214	79	51	59
Room 242E	73	57	56
Room 242F	73	56	56
Room 242G	73	55	56
Room 242I	73	55	56
Room 242J	73	56	56
Room 300A	75	59	60
Room 430	74	56	57
Room 440	74	55	56
Room 442A	74	53	56
Room 442G	76	55	58

Bio-aerosol Sampling

The primary purpose of bio-aerosol sampling is to collect ambient air samples to identify whether fungal (mold) structures (spores and hyphal fragments) are present. A secondary purpose is to evaluate the sample data to assess whether the data can be used to assist investigators in testing hypothesis and to evaluate whether atypical conditions exist. Samples collected as part of a sampling plan are often compared to interior comparison, exterior comparison samples and/or outdoor comparison data. Limitations exist with the data produced because to have true statistical confidence in the data requires numerous replicate samples to be collected. Collecting the required number of samples for statistical validity is not always possible in real world situations often due to the economics of collecting so many samples. However, the samples can be used as a tool to assist investigators test hypothesis and develop remedial actions. It is for this reason bioaerosol sampling should never be completed alone, if sampling occurs it must be completed alongside a site investigation and collection of other data because data from bioaerosol sampling cannot be relied upon solely.

According to the United States Environmental Protection Agency (USEPA), when comparing indoor conditions to outdoors for the presence of fungi (mold), air samples should be compared by fungal type and quantity of fungal spore's present. A typical indoor environment without a mold problem contains similar types with similar or lower quantities of fungal spores compared to outdoors levels. Fungal spore quantities higher than outdoors suggests a fungal reservoir(s) exists and is contributing mold spores to the indoor ambient air.

Currently there are no accepted standards or regulatory requirements issued from OSHA, EPA or other state and federal agencies that establish unacceptable levels for fungi (mold) in indoor environments. As a result, utilizing comparison outdoor samples or statistically derived outdoor data is a practical approach to assess conditions in a property.

Variability with outdoor samples over short time spans and changing weather conditions can occur, which result in a lack of confidence in the data when comparing outdoor to indoor samples. When necessary, AirMD utilizes a national accredited laboratory database of typical outdoor fungal concentrations (see table below), to compare indoor to outdoor samples as an aid in interpreting conditions along with the other important aspects of an assessment (including but not limited to visual observations, moisture mapping).

The table for typical outdoor spore levels contains a list of fungal genera with associated spores/m^3 count values. The spore count values are listed under low, medium and high headers. The low and high values represent the 5% and 97.5% percentile values while the medium value is the 50% percentile value (median) of the spore count. To assist with the data interpretation, the medium (median) value was used. Due to the limitations of the sampling and analytical procedures involved with fungal (mold) air samples, the data obtained cannot be used to establish a health-based risk assessment.

Bio-aerosol samples were collected from the rooms 214, 401B, 430, 440, 442G, 300A, 242I and 242 using a sampling pump calibrated to fifteen liters and slit impactor cassettes containing a sticky acrylic matrix to trap particulate matter from the ambient air. The samples once collected were sent to an independent accredited laboratory under chain of custody. All samples were analyzed using brightfield microscopy. In relation to the comparison outdoor air data, elevated fungal spores were detected in the rooms 214 and 300A. Specifically, the following genus/genera were considered elevated: Cladosporium sp.

Typical Florida Outdoor Fungal Comparisons (spores/m^3)			
Fungal Type	**Low**	**Medium**	**High**
Alternaria sp.	7	13	193
Basidiospores	27	373	10579
Bipolaris/Dreschlera group	7	13	187
Botrytis sp.	7	13	293
Chaetomium sp.	7	13	201
Cladosporium sp.	27	427	7817
Curvularia sp.	7	40	1034
Epicoccum sp.	7	20	314
Nigrospora sp.	7	17	213
Oidium sp.	7	13	158
Penicillium/Aspergillus types	27	213	3675
Rusts	7	13	361
Smuts	7	40	680
Stachybotrys sp.	7	13	400
Torula sp.	7	13	141

Surface Swab Sampling

Sampling of surfaces was conducted to assess for the presence of fungi (mold) using collection swabs. The purpose of the sampling was to determine whether fungal (mold) structures were present on the material sampled and to identify the genus of fungi (mold) present. Swabs have a fibrous tip and sample collection included placing the swab tip onto the surface to remove any fungal structures that may be present. The swab is placed into a holding tube which contains a transport medium. The samples, once collected, were sent to an independent accredited laboratory under chain of custody. All samples were analyzed using brightfield microscopy. It must be noted sample collection must be completed alongside a visual assessment as the data alone cannot be relied upon solely.

Swab samples were collected from the air conditioner supply registers in rooms 442A, 401B and 442G. Fungal structures considered above background levels were detected in the air conditioner supply registers in rooms 442A and 442G belonging to the following genus/genera: Cladosporium sp.

Bulk Sampling for the Presence of Asbestos Fibers

Sampling of dust was conducted to assess for the presence of asbestos fibers in the dust present on the surfaces. The samples, once collected, were sent to an independent accredited laboratory under chain of custody. All samples were analyzed using Polarized Light Microscopy (PLM). Asbestos fibers were not identified in the sample collected.

6.0 Specifications for Mold Remediation (Protocol)

The following document is the Specifications for Mold Remediation developed from the site visit conducted at 675 West Call Street, Tallahassee, FL 32304. This document provides the guidelines that must be followed for the mold remediation portion of the project. The specifications are designed to provide guidelines for a scope of work that a contractor may follow during the remediation of the subject property. Guidance described in this document is provided for use in selecting a Florida licensed mold remediator who can effectively and safely implement mold remediation within the property.

Project Purpose and Objectives

The goal of the mold remediation project is to abate building materials that are water damaged and/or impacted by microbial matter, leaving the building in an acceptable condition and ready for build-back. The purpose of this specification document is to provide guidelines for the chosen remediation contractor to aid in the completion of the project in a safe, expedient and competent manner. Additionally, this document serves to outline the key elements associated with the scope of work. The efforts undertaken must be completed in a safe manner which will not cause additional contamination or exposure to others. This in conjunction with the correction of the conditions causing the problems will allow for the property to return to an acceptable state.

Scope

The scope of remediation work specified shall be completed by the selected remediation contractor.

The development of this Specifications for Mold Remediation document is consistent with the guidance provided by IICRC S520, Standard and Reference Guide for Professional Mold Remediation, USEPA Mold Remediation in Schools and Commercial Buildings guidelines and IICRC S500 Standard and Reference Guide for Professional Water Damage Restoration. As a result, the remediation activities shall comply with this specifications document, the guidance documents referenced above and where applicable, regulations of the US Occupational Safety and Health Administration (OSHA) Mold Remediation - Building Assessment, Restoration, and Demolition. Additionally, compliance with all applicable state regulations is required.

The selected remediation contractor will be responsible for providing all labor, equipment, and supplies necessary to complete the remediation as outlined below. The project intent is to correct all the building related issues relative to moisture and mold along with the remediation of the affected interior building materials. This document does not alleviate the contractor or other project representatives of their responsibilities to serve their positions with the highest level of professionalism nor does it intend to cover all aspects of the project. Each entity involved in the project is responsible for the work they conduct related to their area of expertise and this document is for guidance purposes to provide assistance.

Prior to commencing remediation, all issues should be identified and corrected. Containment is required in the rooms 214, 242-I, 242-F and 300-A.

Air filtration devices/scrubbers must be placed in the containments. Each containment area should be supplied with enough air filtration devices to maintain 4 air changes per hour. Air changes may be calculated by determining the air volume within the containment area and dividing by the flow rate at which the air filtration device filters the air. Each air filtration device should be the type typically utilized in the remediation and/or abatement industry, or equivalent.

The air filtration device shall be equipped with necessary pre-filters and HEPA filters to filter particulates from the air. Dehumidifiers must be placed in the containment(s).

Note that in the event visible damage or mold growth is observed beyond the areas listed in this report, removal of the affected materials must continue for a minimum of two linear feet beyond visible mold growth. HEPA vacuum clean and damp wipe any exposed wall cavities.

Remove any affected wallboard and baseboards that are visibly affected. Assess the conditions of any building materials behind the materials that require removing listed previously in this report. Assess wall cavities using a light source and mirror. In the event additional areas of contamination are identified, removal should continue until all areas are removed. Additionally, any exposed batt insulation that is affected should be removed. Conduct a visual inspection on any wood components present (studs, furring strips) and if it is affected, lightly sand and HEPA vacuum the wood framing. In the event this does not remove the mold growth, or the wood components are rotted, remove the affected wood materials. Note, assess whether the wood components have any structural significance to the building and if the potential exists, do not remove. Contact a qualified licensed structural engineer.

The carpets present should be cleaned in accordance with the IICRC S520. As directed in the standard most cleaning processes should begin and end with HEPA vacuuming. If concerns exist regarding the effectiveness of HEPA vacuuming, the carpet should be professionally cleaned in accordance with the IICRC S300 *"Standard and Reference Guide for Professional Upholstery Cleaning"*.

The HVAC (heating, ventilating, air conditioning) system must not operate in the containment during remediation.

The use of encapsulants and sealants is not encouraged but may be used in certain circumstances. Encapsulants and sealants used must be EPA registered and where possible clear when applied. In accordance with Florida law, the property owner and mold assessor should be notified with permission granted before application.

Note that Federal, State and local regulations may require asbestos testing prior to demolition of any materials that may be removed or disturbed during the remediation process.

Project Requirements

The remediation contractor chosen must be a qualified licensed mold remediation company meeting the requirements set forth by the state of Florida and have a current Mold-Related Services Remediator License for the state of Florida.

The remediation contractor shall provide all labor, materials, supervision, and necessary equipment to perform the work required. While the assessments of the building performed were intended to define the extent and severity of observable and accessible water damage and mold contamination within the property, some areas of mold growth may not have been discovered. In the course of any further inspections or remediation performed by the remediation contractor, any areas of water damage or suspected microbial contamination that were not discovered during earlier assessments, or that may have been initiated in the time since the last assessment, must be documented photographically and removed.

The remediation contractor is solely responsible for the protection of health, safety and the environment at the job site. The remediation contractor is solely responsible for all required training and licensure related to any work related to the mold remediation project. Health and safety standards must be followed at all times during the project. The U.S. Occupational Safety and Health Administration (OSHA) standards 29 CFR Parts 1910 and 1926 must be adhered to. The contractor must have an established and maintained respiratory protection program in place ensuring personal protective equipment is used during work practices.

The successful remediation contractor shall have on staff an individual that is licensed under and complies with the requirements of 2010 Florida Statute, Title XXXII, Chapter 468. The licensed remediation contractor must have proven experience handling projects of this size and complexity and must ensure safe completion of the work. The remediation contractor is responsible for all labor, supervision, and equipment to complete the project in the time frame agreed upon. The contractor must maintain constant surveillance of the project allocating responsibilities to qualified personnel only.

The remediation contractor and his/her designated "licensed, qualified personnel" must maintain all aspects of the remediation scope including but not limited to health and safety standards, worker training documentation, maintaining project timelines and implementing corrective actions if post remediation verification results are unfavorable. Additionally, the contractor will ensure all standards are maintained during containment structure and contaminated material disposal.

The licensed mold remediator shall designate a qualified licensed mold remediation project manager who will be responsible for project planning, executing and maintaining constant surveillance and direct supervision of the mold remediation work being performed. The remediation contractor shall staff the project accordingly to meet this responsibility given the proposed work schedule and scope. The project staff shall have received prior training related to but not limited to the removal, cleaning, sanitizing, demolition, or other treatment. The remediation contractor shall maintain current training documentation of all such on-site workers.

The remediation contractor shall assure significant on-site involvement by the licensed mold remediator. The duties of the remediation project manager will include, but are not limited to, the following:

- Verifying project accomplishments and observing completed or in process work for proper standard of care.
- Assessing conformance of constructed containment barrier systems and other engineering controls with the project specifications.
- Assessing the containment, handling and disposal of mold impacted building materials, cleaning supplies and other materials generated and used by the contractor to accomplish the work.
- Reviewing worker training records and health & safety program compliance.
- Reviewing the results of post remediation verification sample analyses.
- Performing spot checks for remediation quality assurance purposes.
- Being available "as needed" to assist with unexpected findings or changed conditions.

Post Remediation Clearance Criteria

At the conclusion of the remediation, AirMD Inc will perform a thorough visual assessment and document the assessment through photographs that will become part of the project record. Should areas of visible mold or water damage be noted during the assessment, the remediation contractor will be notified and will be required to address the identified areas. The assessment process will be repeated until all visual mold and/or water damage has been removed.

Post remediation clearance criteria for the remediation scope of work conducted shall be accomplished based on the following procedures: visual assessment of the work area(s), moisture mapping of the remaining building materials, and collection of ambient air samples.

The visual assessment is to verify that the containment remained constructed in a manner that prevented cross contamination during the demolition and cleaning phases, all of the affected materials have been removed and the remaining materials and containment areas are visibly free of visible mold and excess dust and debris.

The moisture assessment is to verify that all remaining building materials are dry and moisture intrusion is not occurring through the building envelope. Wet materials provide favorable conditions for mold growth and would indicate that the original source(s) of the problem was not corrected properly.

Air samples will be collected for microscopic analysis and will be sent to an independent accredited laboratory. The sample results must satisfy multiple criteria including the total indoor fugal counts, fungal counts relative to wet/damp indicator organisms (Stachybotrys sp., Chaetomium sp., Memnoniella sp.,) as well as other fungal genera.

The contractor's representative must contact AirMD prior to the remediation area's readiness for visual inspection and post-remediation sampling.

In accordance with Florida licensing statutes, the activities necessary to perform the cleaning and verification of cleanliness of the Heating, Ventilating and Air Conditioning system (HVAC) must be completed by a qualified licensed mechanical contractor. As a result of this, the cleanliness of the HVAC will not be included in the AirMD's post remediation assessment procedure. It is the responsibility of the remediation contractor to have this completed and documented by a qualified licensed mechanical contractor.

The remediation contractor shall re-clean and wipe down if the post remediation samples fail or if the final visual inspection fails. This process of re-cleaning and re-wiping shall continue until a successful post remediation is achieved. This section will not be applicable if there are special or unusual contamination conditions discovered during the remediation activities and AirMD is contacted and agrees in writing that this would substantially change the scope of work and affect post remediation testing.

Once all identified items have been successfully addressed, the remediation contractor shall demobilize from the site. All equipment, materials, and supplies utilized by the contractor during completion of this scope of work shall be removed from the building at the conclusion of remediation activities.

AirMD used its best professional judgment and followed industry standards in completing the project. The results are valid at the time of sample collection and do not guarantee that conditions in the future will not cause changes.

Sincerely,

Rachael Rupp
Senior Consultant
State of Florida Mold Assessor License: MRSA 2343

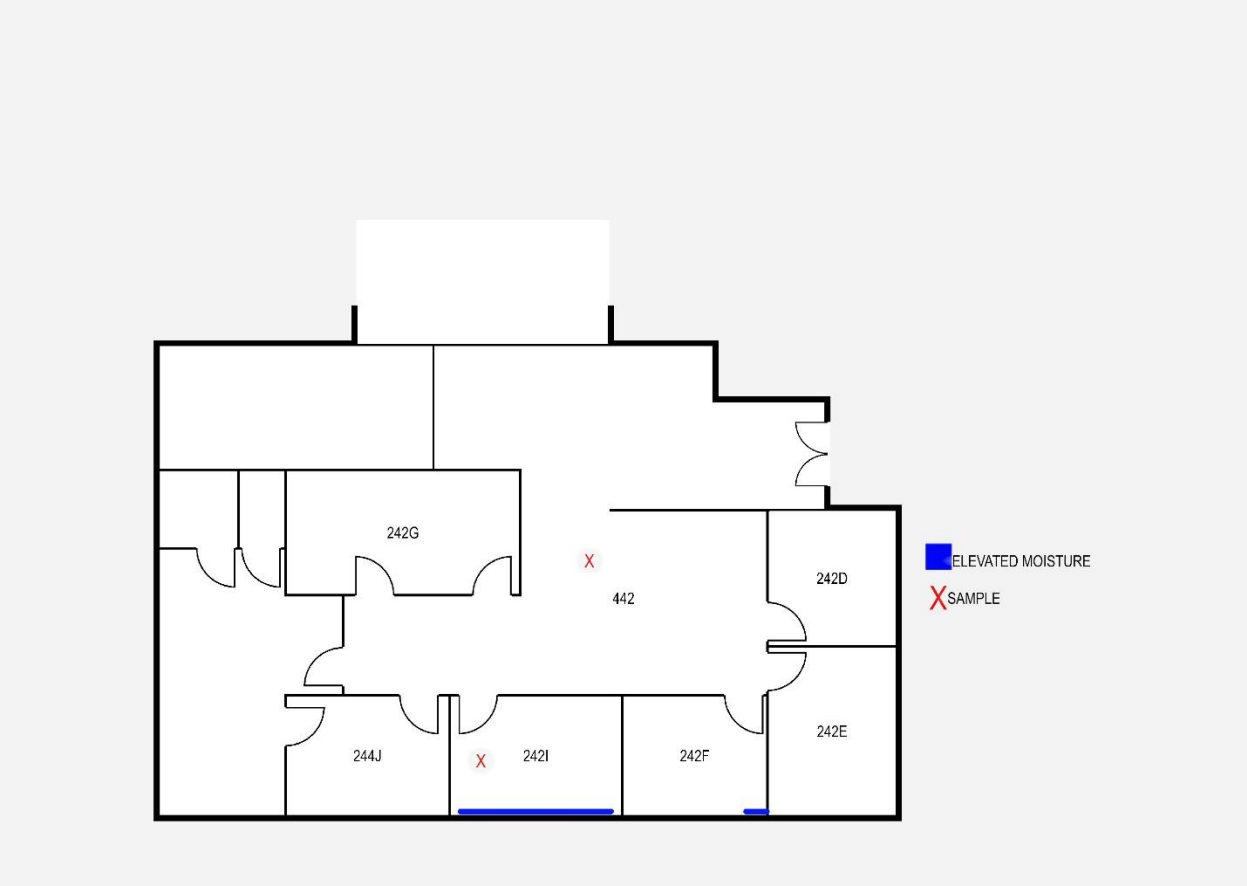
Limitations: AirMD's test results do not guarantee that the indoor environment is free from contaminates, gases, organisms or analytes sampled for. The customer understands that the there are limitations associated with the instrumentation used associated with accuracy, precision, and uncertainty. Additionally, further limitations are present because of sampling and measurement methods/procedures utilized in testing and measuring as well as any or all other factors such as environmental and climatic conditions. Control samples such as duplicates, blanks and comparison samples were all considered as part of the sampling plan and those implemented were based on the agreement with the client with considerations made relative to economic factors. The customer is aware that destructive testing was not performed and the customer understands that the assessment and testing/measurements completed, and the results generated as a result of the assessment and testing/measuring are representative of conditions found at the time and that conditions can change over time. Customer understands that the test results do not guarantee that the indoor environment is free from contaminates, gases, organisms or analytes sampled for. Customer herby acknowledges that microbiological growth reoccurs if the root cause or source of the growth is not remedied and that no investigation can absolutely rule out the existence of any microbiological growth at any given site. AirMD retains the right to supplement this report should additional information become available and/or further issues are discovered. AirMD reserves the right to assess the potential impact of the new information on the findings and to revise the report, if necessary, as warranted by the information or discovery. In some instances, as a service to the client, AirMD may provide advice with respect to selecting other such contractors and assistance in monitoring their performance. In no event will AirMD assume any liability or responsibility for the work performed by other contractors.

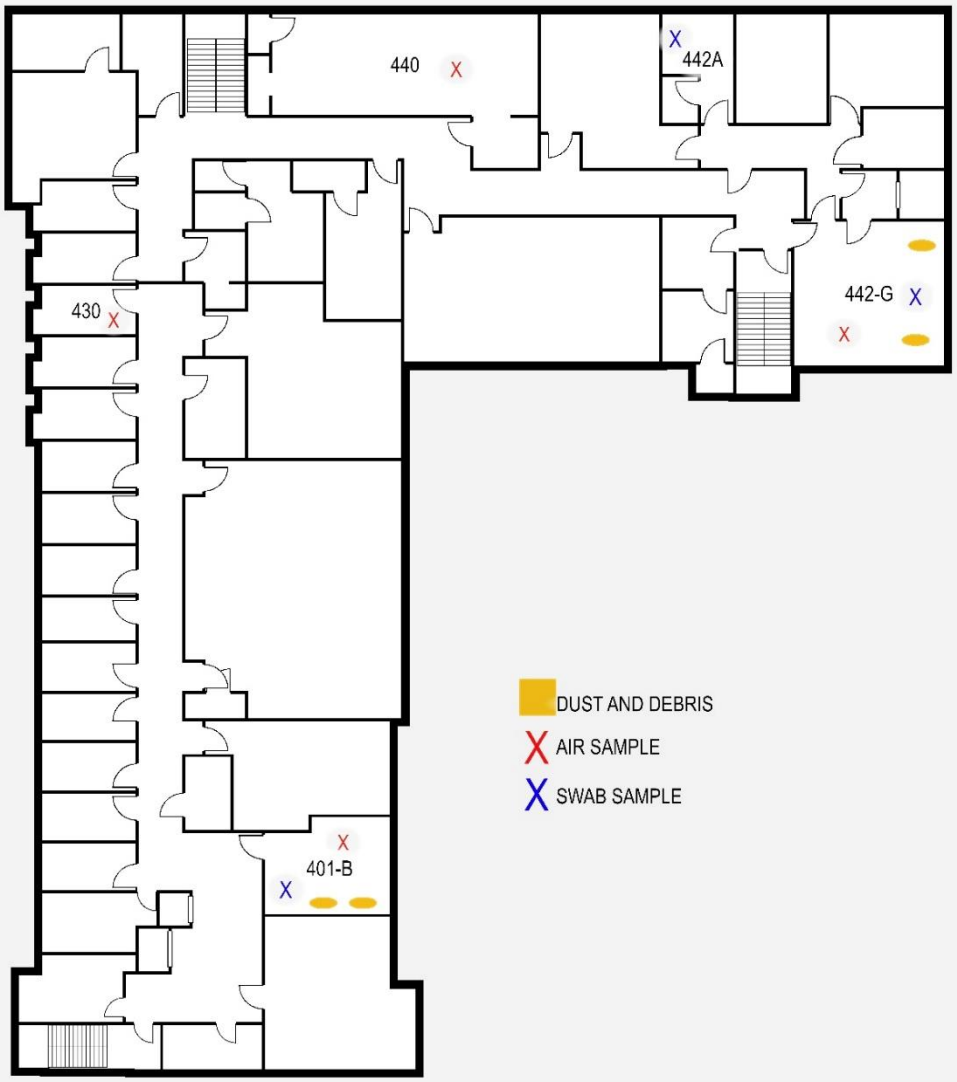
Customer understands that the testing/measuring or overall activities completed by AIRMD and their representatives does not generate or contribute to levels of contaminates, pollutants, toxins or hazardous substances. All reports, plans, specifications, computer files, field data, notes and other documents and instruments prepared by AirMD as instruments of service shall remain the property of AirMD. AirMD shall retain all common law, statutory and other reserved rights, including the copyright thereto. AirMD is not responsible for advising Client about its reporting obligations and Client agrees that it shall be responsible for all reporting, unless AirMD has an independent duty to report under applicable law. Except as otherwise specifically provided herein, AirMD makes no express or implied warranties or guarantees of any kind, including but not limited to any implied warranties of merchantability or fitness for a particular purpose, all of which are hereby expressly disclaimed. In no event shall AirMD be liable to Customer or any third party for any incidental, consequential indirect, special or punitive damages arising out of or in connection with the services to be performed by AirMD. In no event shall AirMD be liable to Customer or any third party for any amounts in excess of the amounts received by AirMD from Customer hereunder. For all other liabilities arising from or related to AirMD's services, AirMD's total obligation to client shall be to reperform its services that do not meet the standard of care related to the work scope completed.

AirMD's opinions as noted in the report are based on the findings and upon our professional experience with no warranty or guarantee implied. AirMD accepts no responsibility for interpretations or actions based on this report by others. The findings, results and conclusions as part of our assessment are only representative of conditions at the time of the AirMD visit and do not represent conditions at other times. This report is intended for your use only. Its data and content shall not be used or relied upon by other parties without prior written authorization of AirMD.

Appendix A

Floor Plans

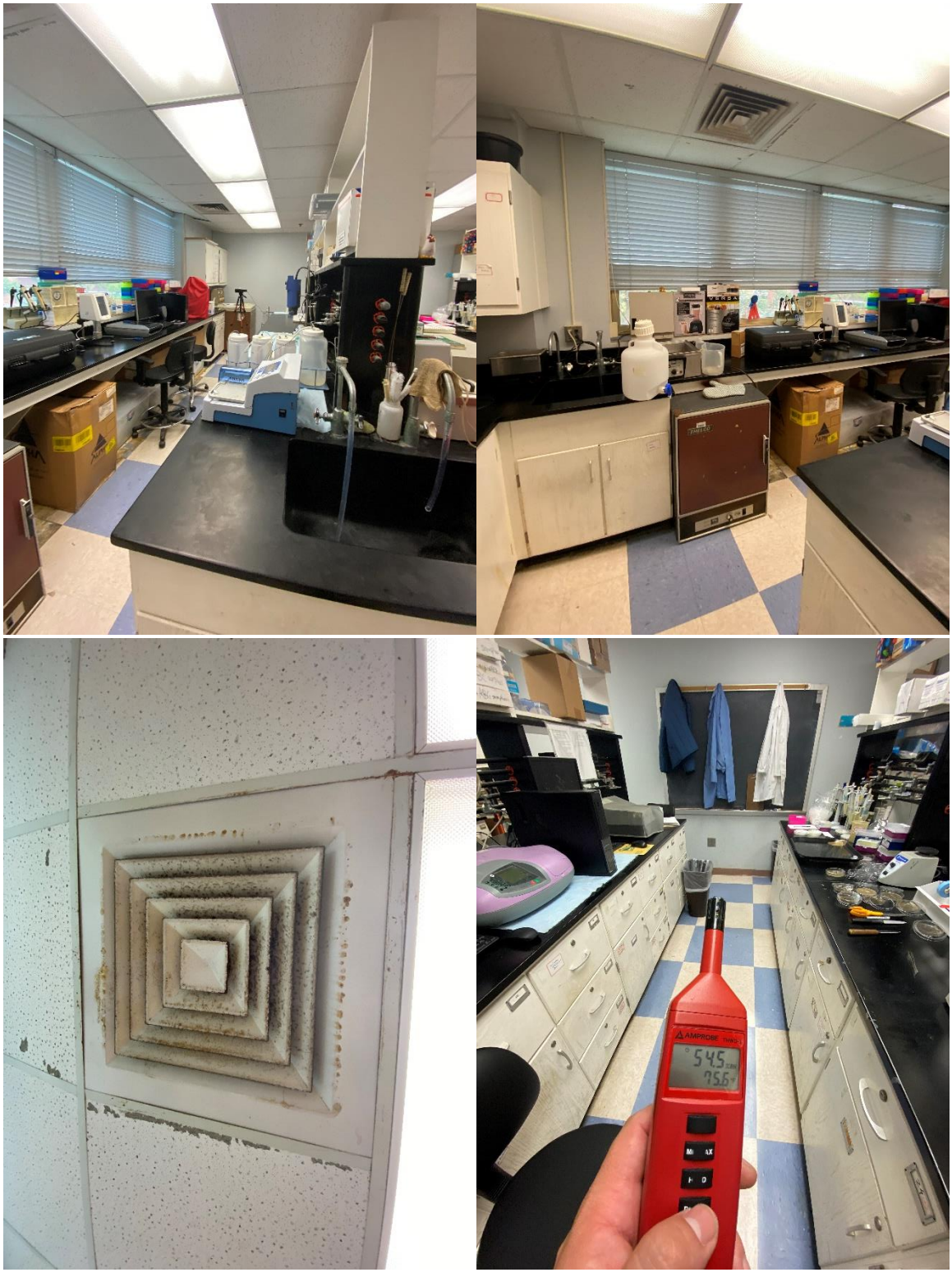


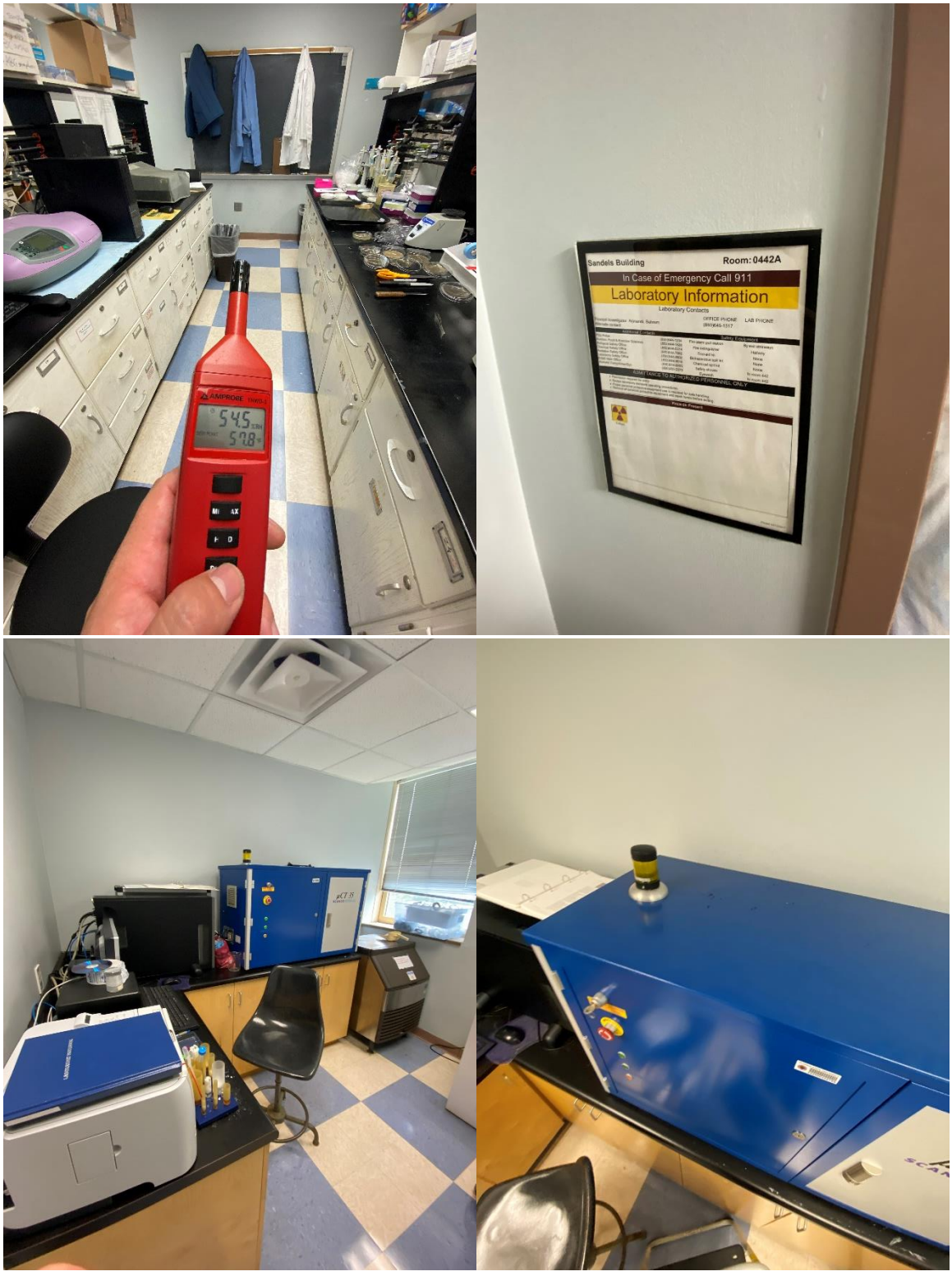


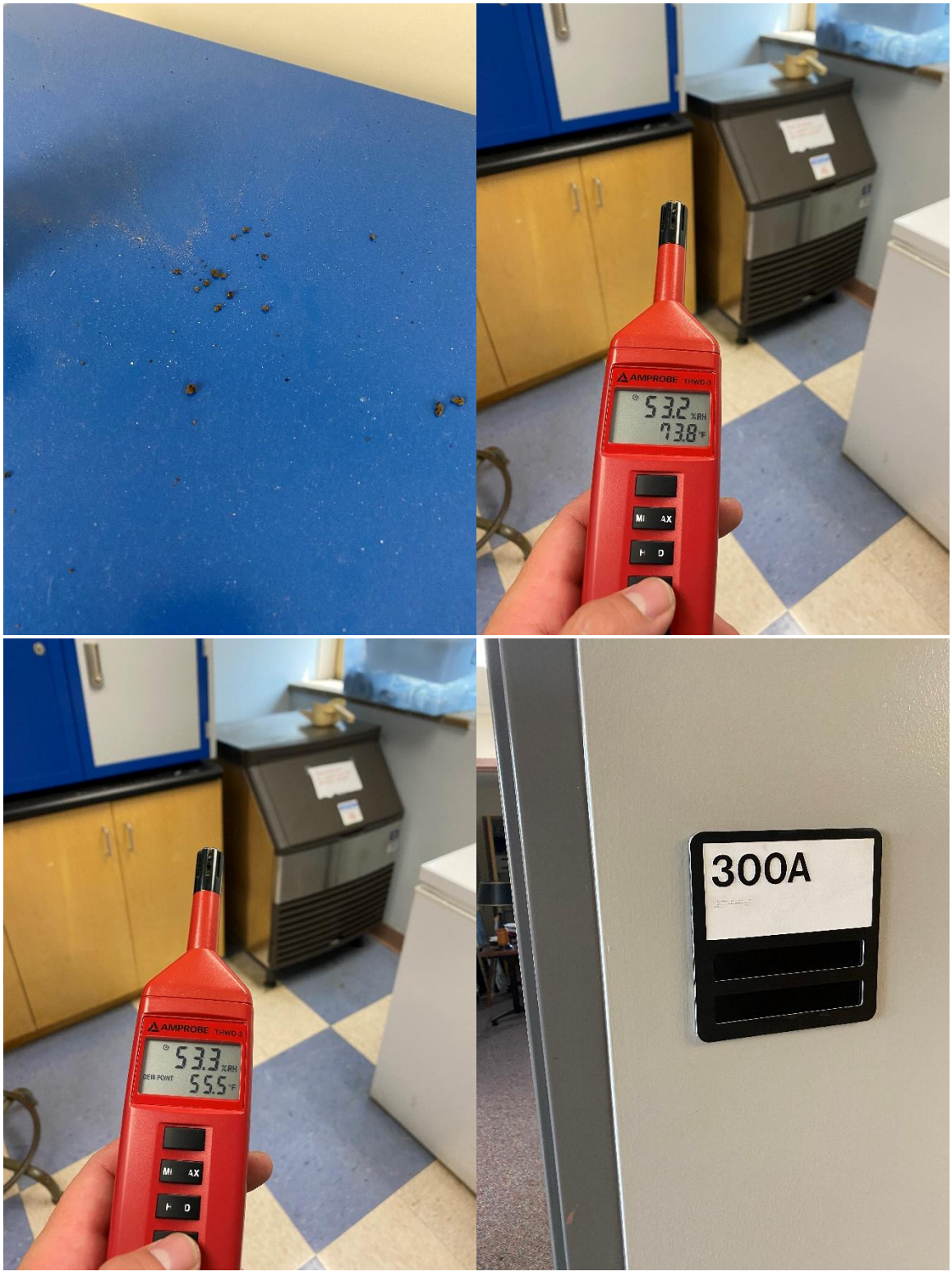
Appendix B

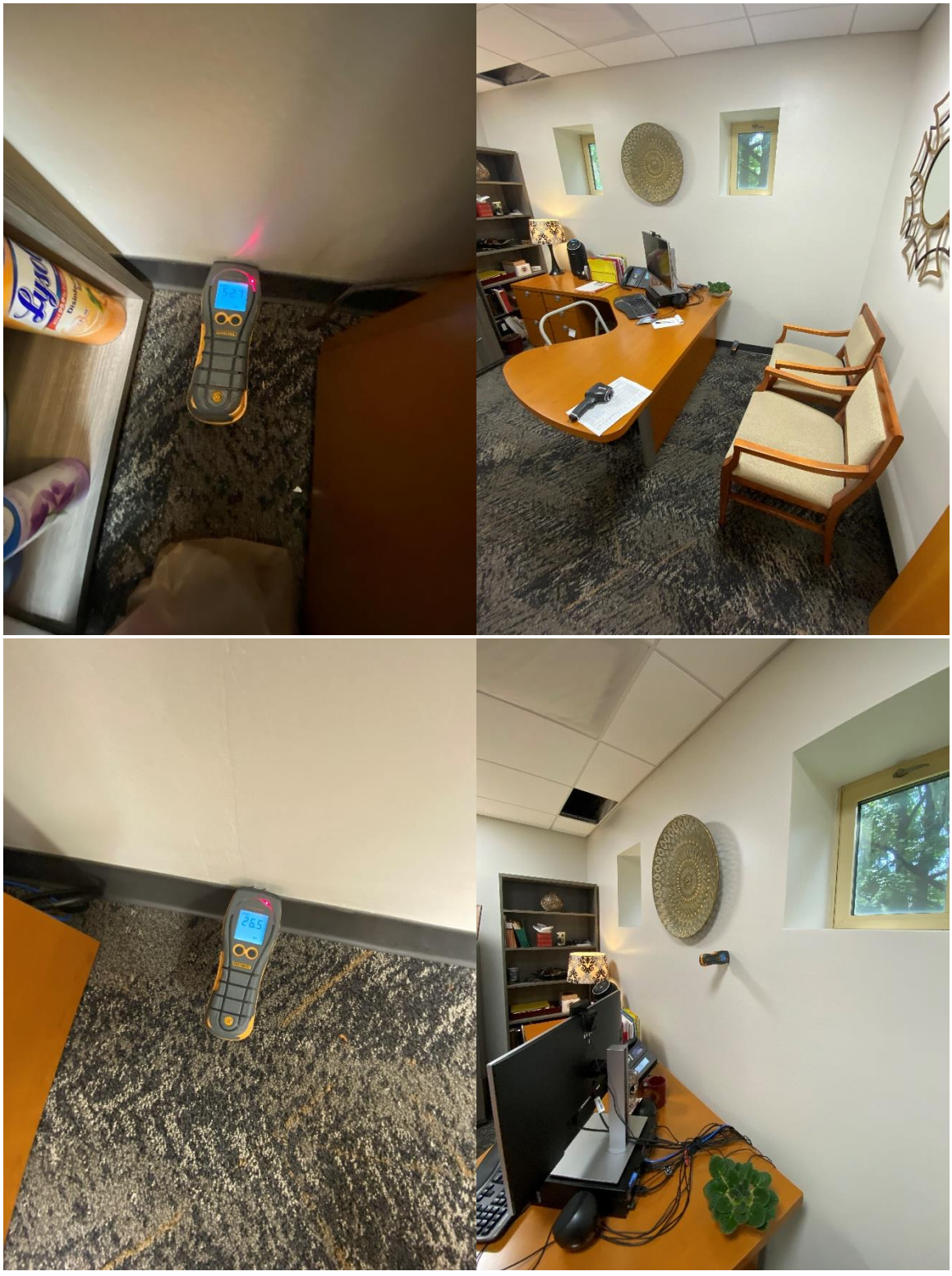
Photographic Documentation

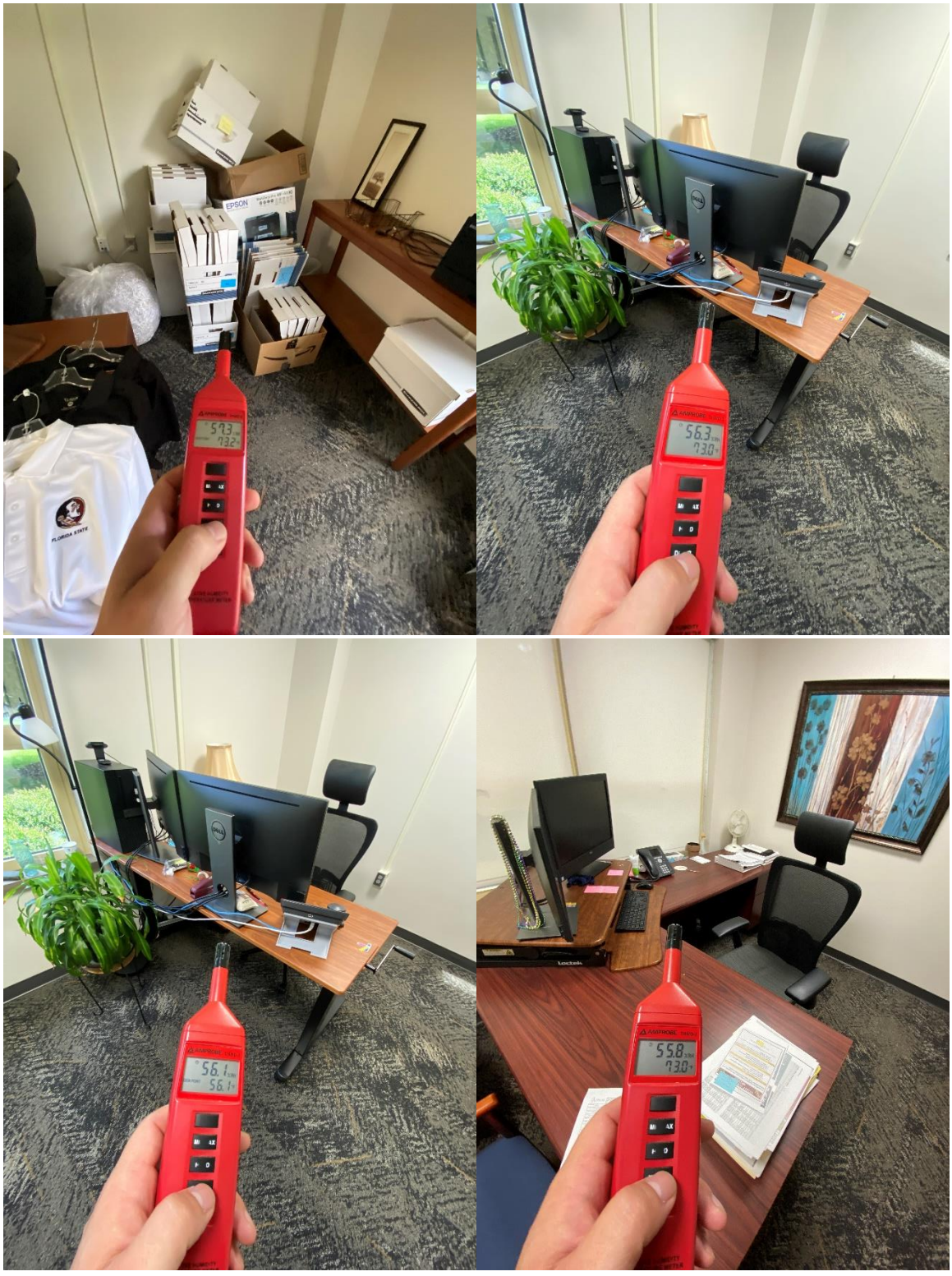
(Selection of relevant photos supplied, entire photo file for the project is available upon request)

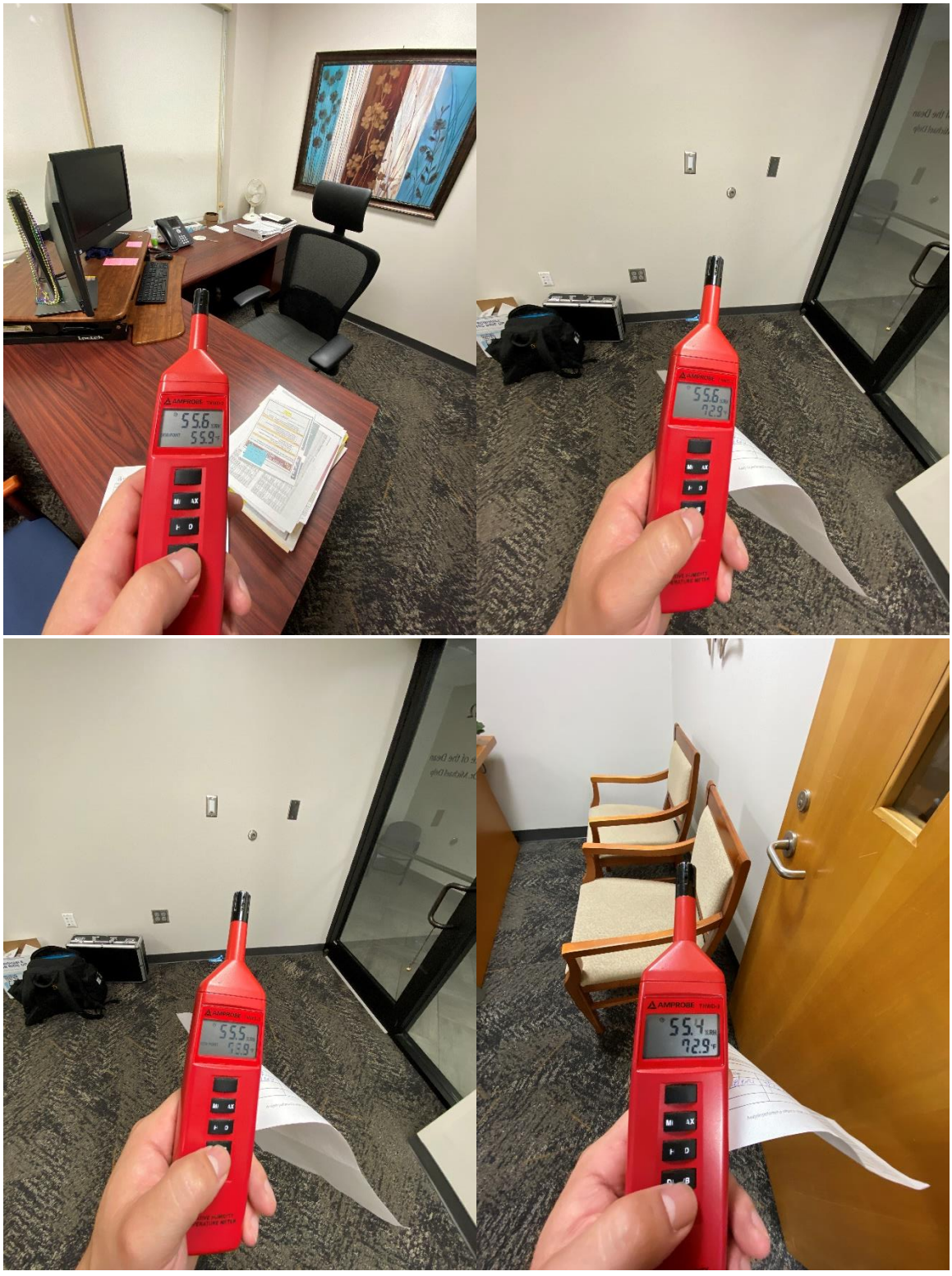


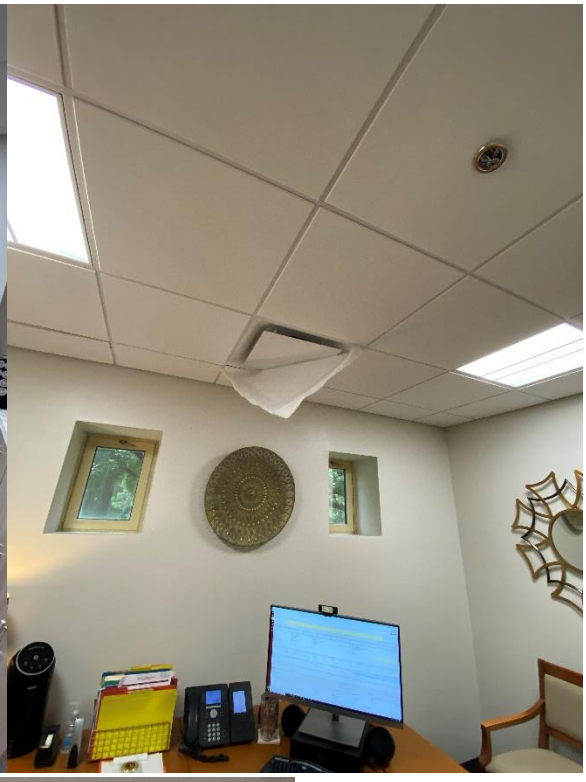












Appendix C

Laboratory Results

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Project: 21-02509-GT Florida State University Sandels

Batch: 331582

Sampled: 7/28/2021
Received: 7/30/2021
Analysis Date: 7/30/2021
Report Date: 7/30/2021

AEML Test: A001 Spore Trap Analysis

Sample ID:	331582-01	331582-02	331582-03	331582-04
Client Sample ID:	33051347 Room 214	33051364 Room 401-B	32736380 Room 430	33051355 Room 440
Volume Sampled (L):	75	75	75	75
Media:	Air-O-Cell	Air-O-Cell	Air-O-Cell	Air-O-Cell
Percent of Trace Analyzed:	100% at 600X Magnification	100% at 600X Magnification	100% at 600X Magnification	100% at 600X Magnification

Spore Types	**Raw Count**	**Count/m³**	**%**	**Raw Count**	**Count/m³**	**%**	**Raw Count**	**Count/m³**	**%**	**Raw Count**	**Count/m³**	**%**
Alternaria	—	—	—	—	—	—	—	—	—	—	—	—
Arthrinium	—	—	—	—	—	—	—	—	—	—	—	—
Ascospores	3	40	3	3	40	100	3	40	43	—	—	—
Aspergillus/Penicillium-Like	—	—	—	—	—	—	—	—	—	2	27	67
Basidiospores	1	13	1	—	—	—	—	—	—	—	—	—
Bipolaris/Dreschlera	—	—	—	—	—	—	—	—	—	—	—	—
Botrytis	—	—	—	—	—	—	—	—	—	—	—	—
Chaetomium	—	—	—	—	—	—	—	—	—	—	—	—
Cladosporium	112	1,493	95	—	—	—	3	40	43	—	—	—
Curvularia	1	13	1	—	—	—	—	—	—	1	13	33
Epicoccum	—	—	—	—	—	—	1	13	14	—	—	—
Fusarium	—	—	—	—	—	—	—	—	—	—	—	—
Ganoderma	—	—	—	—	—	—	—	—	—	—	—	—
Memnoniella	—	—	—	—	—	—	—	—	—	—	—	—
Nigrospora	1	13	1	—	—	—	—	—	—	—	—	—
Oidium/Peronospora	—	—	—	—	—	—	—	—	—	—	—	—
Pithomyces	—	—	—	—	—	—	—	—	—	—	—	—
Rust	—	—	—	—	—	—	—	—	—	—	—	—
Smut/Myxomyces/Periconia	—	—	—	—	—	—	—	—	—	—	—	—
Stachybotrys	—	—	—	—	—	—	—	—	—	—	—	—
Torula	—	—	—	—	—	—	—	—	—	—	—	—
Ulocladium	—	—	—	—	—	—	—	—	—	—	—	—
Unidentified Spores	—	—	—	—	—	—	—	—	—	—	—	—
Total Spores	**118**	**1,573**		**3**	**40**		**7**	**93**		**3**	**40**	
Hyphal Fragments	44	587		—	—		3	40		—	—	
Pollen	2	27		—	—		1	13		2	27	
Debris Rating	3			2			3			3		
Detection Limit	13			13			13			13		

Estimation performed due to high count.

Joshua Krinsky
Technical Director

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Batch: 331582

Sampled: 7/28/2021
Received: 7/30/2021
Analysis Date: 7/30/2021
Report Date: 7/30/2021

AEML Test: A001 Spore Trap Analysis

Sample ID:	331582-05	331582-06	331582-07	331582-08
Client Sample ID:	32736389 Room 442G	32736387 Room 300A	32736382 Room 242I	32736375 Room 242
Volume Sampled (L):	75	75	75	75
Media:	Air-O-Cell	Air-O-Cell	Air-O-Cell	Air-O-Cell
Percent of Trace Analyzed:	100% at 600X Magnification	100% at 600X Magnification	100% at 600X Magnification	100% at 600X Magnification

Spore Types	Raw Count	Count/m³	%	Raw Count	Count/m³	%	Raw Count	Count/m³	%	Raw Count	Count/m³	%
Alternaria	—	—	—	—	—	—	—	—	—	1	13	13
Arthrinium	—	—	—	—	—	—	—	—	—	—	—	—
Ascospores	2	27	29	11	147	2	2	27	22	1	13	13
Aspergillus/Penicillium-Like	—	—	—	11	147	2	—	—	—	—	—	—
Basidiospores	4	53	57	—	—	—	—	—	—	—	—	—
Bipolaris/Dreschlera	—	—	—	—	—	—	—	—	—	—	—	—
Botrytis	—	—	—	—	—	—	—	—	—	—	—	—
Chaetomium	—	—	—	—	—	—	—	—	—	—	—	—
Cladosporium	1	13	14	513 #	6,840	94	2	27	22	4	53	50
Curvularia	—	—	—	5	67	1	2	27	22	2	27	25
Epicoccum	—	—	—	—	—	—	—	—	—	—	—	—
Fusarium	—	—	—	—	—	—	—	—	—	—	—	—
Ganoderma	—	—	—	1	13	<1	—	—	—	—	—	—
Memnoniella	—	—	—	—	—	—	—	—	—	—	—	—
Nigrospora	—	—	—	—	—	—	—	—	—	—	—	—
Oidium/Peronospora	—	—	—	—	—	—	—	—	—	—	—	—
Pithomyces	—	—	—	1	13	<1	1	13	11	—	—	—
Rust	—	—	—	—	—	—	—	—	—	—	—	—
Smut/Myxomyces/Periconia	—	—	—	2	27	<1	2	27	22	—	—	—
Stachybotrys	—	—	—	—	—	—	—	—	—	—	—	—
Torula	—	—	—	—	—	—	—	—	—	—	—	—
Ulocladium	—	—	—	—	—	—	—	—	—	—	—	—
Unidentified Spores	—	—	—	—	—	—	—	—	—	—	—	—
Total Spores	**7**	**93**		**544**	**7,253**		**9**	**120**		**8**	**107**	
Hyphal Fragments	—	—		1,404 #	18,720		1	13		7	93	
Pollen	—	—		2	27		—	—		—	—	
Debris Rating	2			3			3			3		
Detection Limit	13			13			13			13		

Estimation performed due to high count.

Joshua Krinsky
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ACCREDITED TESTING CERT #2572.01

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Project: 21-02509-GT Florida State University Sandels

Batch: 331582

Sampled: 7/28/2021
Received: 7/30/2021
Analysis Date: 7/30/2021
Report Date: 7/30/2021

AEML Test: A001 Spore Trap Analysis

Sample ID:	331582-09
Client Sample ID:	32736549 Outside
Volume Sampled (L):	75
Media:	Air-O-Cell
Percent of Trace Analyzed:	100% at 600X Magnification

Spore Types	Raw Count	Count/m³	%
Alternaria	—	—	—
Arthrinium	—	—	—
Ascospores	10	133	11
Aspergillus/Penicillium-Like	4	53	4
Basidiospores	3	40	3
Bipolaris/Dreschlera	—	—	—
Botrytis	—	—	—
Chaetomium	—	—	—
Cladosporium	62	827	67
Curvularia	2	27	2
Epicoccum	—	—	—
Fusarium	—	—	—
Ganoderma	1	13	1
Memnoniella	—	—	—
Nigrospora	—	—	—
Oidium/Peronospora	—	—	—
Pithomyces	—	—	—
Rust	—	—	—
Smut/Myxomyces/Periconia	8	107	9
Stachybotrys	—	—	—
Torula	3	40	3
Ulocladium	—	—	—
Unidentified Spores	—	—	—
Total Spores	**93**	**1,240**	
Hyphal Fragments	2	27	
Pollen	1	13	
Debris Rating	3		
Detection Limit	13		

Estimation performed due to high count.

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Project: 21-02509-GT Florida State University Sandels

Batch: 331582

Sampled: 7/28/2021
Received: 7/30/2021
Analysis Date: 7/30/2021
Report Date: 7/30/2021

AEML Test: S001 Swab Analysis

Sample ID:	331582-10	331582-11	331582-12*
Client Sample ID:	A1 Room 442 A	A2 401B	A3 442G
Area Swabbed (cm^2):	5	5	5
Media:	Swab	Swab	Swab
Sample Analysis:	Analyzed at 600X Magnification	Analyzed at 600X Magnification	Analyzed at 600X Magnification

Spore Types	Raw Count	Count/cm²	%	Raw Count	Count/cm²	%	Raw Count	Count/cm²	%
Alternaria	—	—	—	—	—	—	—	—	—
Arthrinium	—	—	—	—	—	—	—	—	—
Ascospores	—	—	—	—	—	—	50	400	13
Aspergillus/Penicillium-Like	—	—	—	4	32	10	28	224	7
Basidiospores	—	—	—	2	16	5	46	368	12
Bipolaris/Dreschlera	—	—	—	—	—	—	—	—	—
Botrytis	—	—	—	—	—	—	—	—	—
Chaetomium	—	—	—	—	—	—	—	—	—
Cladosporium	6,947	55,576	100	32	256	80	234	1,872	59
Curvularia	—	—	—	2	16	5	6	48	2
Epicoccum	—	—	—	—	—	—	—	—	—
Fusarium	—	—	—	—	—	—	—	—	—
Ganoderma	—	—	—	—	—	—	32	256	8
Memnoniella	—	—	—	—	—	—	—	—	—
Nigrospora	—	—	—	—	—	—	—	—	—
Oidium/Peronospora	—	—	—	—	—	—	—	—	—
Pithomyces	—	—	—	—	—	—	—	—	—
Rust	—	—	—	—	—	—	—	—	—
Smut/Myxomyces/Periconia	—	—	—	—	—	—	—	—	—
Stachybotrys	—	—	—	—	—	—	2	16	1
Torula	—	—	—	—	—	—	—	—	—
Ulocladium	—	—	—	—	—	—	—	—	—
Unidentified Spores	—	—	—	—	—	—	—	—	—
Total Spores	**6,947**	**55,576**		**40**	**320**		**398**	**3,184**	
Hyphal Fragments	848	6,784		8	64		16	128	
Detection Limit	94			16			16		

* Bacteria Present.

Joshua Krinsky
Technical Director

CA Labs
Dedicated to Quality

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12232 Industriplex, Suite 32
Baton Rouge, LA 70809
Phone 225-751-5632
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Materials Characterization - Bulk Asbestos Analysis

Laboratory Analysis Report - Polarized Light

Air MD
7700 Congress Ave, Suite 1119
Boca Raton, FL 33487

Customer Project: 2102509-G7 Florida State University
Reference #: CAL21077206RL Date: 07/30/21

Analysis and Method

Summary of polarized light microscopy (PLM / Stereomicroscopy bulk asbestos analysis) using the methods described in 40CFR Part 763 Appendix E to Subpart E (Interim and EPA 600 / R-93 / 116 (Improved). The sample is first viewed with the aid of a stereomicroscope. Numerous liquid slide preparations are created for analysis under the polarized microscope where identifications and quantifications are preformed. Calibrated liquid refractive oils are used as liquid mouting medium. These oils are used for identification (dispersion staining). A calibrated visual estimation is reported, should any asbestiform mineral be present. Other techniques such as acid washing are used in conjugation with refractive oils for detection of smaller quantities of asbestos. All asbestos percentages are based on calibrated visual estimation traceable to NIST standards for regulated asbestos. Traceability to measurement and calibration is achieved by using known amounts and types of asbestos from standards where analyst and laboratory accuracy are measured. As little as 0.001% asbestos can be detected in favorable samples, while detection in unfavorable samples may approach the detection limit of 0.50% (well above the laboratory definition of trace).

Discussion

Vermiculite containing samples may contain trace amounts of actinolite/tremolite. When not detected by PLM, these samples should be analyzed using TEM methods and / or water separation techniques. Suspected actinolite/vermiculite presence will be indicated through the sample comment section of this report.

Fibrous talc containing samples may contain a regulated asbestos fiber known as anthophyllite. Under certain conditions the same fiber may actually contain both talc and anthophyllite (a phenomenon called intergrowth). Again, TEM detection methods are recommended. CA Labs PLM report comments will denote suspected amounts of asbestiform anthophyllite with talc, where further analysis is recommended.

Some samples (floor tiles, surfacings, etc.) may contain fibers too small to be detectable by PLM analysis and should be analyzed by TEM bulk protocols.

A "trace asbestos" will be reported if the analyst observes far less than 1% asbestos. CA Labs defines "trace asbestos" as a few fibers detected by the analyst in several preparations and will indicate as such under these circumstances.

Since allowable variation in quantification of samples close to 1% is high, <1% may be reported. Such results are ideal for point counting, and the technique is mandatory for friable samples (NESHAP, Nov. 1990 and clarification letter 8 May 1991) under 1% percent asbestos or "trace asbestos". **In order to make all initial PLM reports issued from CA Labs NESHAP compliant, all <1% asbestos results (except floor tiles) will be point counted at no additional charge.**

Qualifications

CA Labs is accredited by the National Voluntary Accreditation Program (NVLAP) for selected test methods for airborne fiber analysis (TEM), and for bulk asbestos fiber analysis (PLM). CA Labs is also accredited by AIHA LAP, LLC. in the PLM asbestos field of testing for Industrial Hygiene. All analysts have completed college courses or hold a degree in a natural science (geology, biology, or environmental science). Recognition by a state professional board in one these disciplines is preferred, but not required. Extensive in-house training programs are used to augment the educational background of the analyst. The Laboratory Director and Quality Manager have received supplemental McCrone Research training for asbestos identification. Analysis performed at Crisp Analytical Labs, LLC 1929 Old Denton Road Carrollton, TX 75006

Dallas NVLAP Lab Code 200349-0 TEM/PLM TCEQ# T104704513-15-3 TDH 30-0235
AIHA LAP, LLC Laboratory #102929

CA Labs
Dedicated to Quality

Crisp Analytical, L.L.C.
1929 Old Denton Road
Carrollton, TX 75006
Phone 972-242-2754
Fax 972-242-2798

CA Labs, L.L.C.
12232 Industriplex, Suite 32
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Phone 225-751-5632
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Overview of Project Sample Material Containing Asbestos

Customer Project: 2102509-G7 Florida State University **CA Labs Project #:** CAL21077206RL

Laboratory Sample ID	Sample #	Layer #	Analysts Physical Description of Subsample	Asbestos type / calibrated visual estimate percent	List of Affected Building Material Types
			No Asbestos Detected.		

Dallas NVLAP Lab Code 200349-0 TEM/PLM TCEQ# T104704513-15-3 TDH 30-0235
AIHA LAP, LLC Laboratory #102929

Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):

ca - carbonate
gypsum - gypsum
bi - binder
or - organic
ma - matrix
mi - mica
ve - vermiculite
ot - other
pe - perlite
qu - quartz
fg - fiberglass
mw - mineral wool
wo - wollastinite
ta - talc
sy - synthetic
ce - cellulose
br - brucite
ka - kaolin (clay)
pa - palygorskite (clay)

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Polarized Light Asbestiform Materials Characterization

Customer Info:
Air MD
7700 Congress Ave, Suite 1119
Boca Raton, FL 33487

Phone # 888-462-4763
Fax #

Attn:

Customer Project:
2102509-G7 Florida State University

Turnaround Time:
24 Hours

CA Labs Project #:
CAL21077206RL

Date: 7/30/2021
Samples Rec'd: 7/29/21 5:00pm
Date Of Sampling: 7/28/2021
Purchase Order #:

Laboratory Sample ID	Sample #	Comment	Layer #	Analysts Physical Description of Subsample	Homogeneous (Y/N)	Asbestos type / calibrated visual estimate percent	Non-asbestos fiber type / percent	Non-fibrous type / percent
70007	A1		*1-1*	***Dust/debris**/ black felt*	*y*	***None Detected***	35% ce	65% qu,bi

Dallas NVLAP Lab Code 200349-0 TEM/PLM TCEQ# T104704513-15-3 TDH 30-0235

AIHA LAP, LLC Laboratory #102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116). *All samples received in good condition unless noted.*
Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

ca - carbonate	mi - mica	fg - fiberglass	ce - cellulose
gy - gypsum	ve - vermiculite	mw - mineral wool	br - brucite
bi - binder	ot -other	wo - wollastonite	ka - kaolin (clay)
or - organic	pe - perlite	ta - talc	pa - palygorskite (clay)
ma - matrix	qu - quartz	sy - synthetic	

Approved Signatories:

Aldwin Vasquez
Analyst

Julio Robles
Analyst

Technical Manager
Tanner Rasmussen

Senior Analyst
Julio Robles

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
2. Fire Damage no significant fiber damages effecting fibrous percentages
3. Actinolite in association with Vermiculite
4. Layer not analyzed - attached to previous positive layer and contamination is suspected
5. Not enough sample to analyze
6. Anthophyllite in association with Fibrous Talc
7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method
9. < 1% Result point counted positive
10. TEM analysis suggested

CA Labs

CA Labs
1929 Old Denton Rd.
Carrollton, TX 75006

Phone: 972-242-2754
Fax: 972-242-2798
Mobile: 469-222-6967

Chain of Custody

Client Name:	AirMD	**CA Labs Job #**	**CAL** 21077206
Client Address:	AirMD 7700 Congress Ave Suite 1119 Boca Raton, FL 33487	Billing Address: (if different)	
Phone Number:	561-245-4500	P.O. #:	
Fax Number:		**Project Name:**	FLORIDE STATE UNIVERSITY SANDELS.
Send Reports to:	labresults@airmd.com	**Project Number:**	21 02509 – G7

Contact: _____ Report Results: Via: Email X FAX Verbal

Total # Samples Submitted:	**Total # Samples to be Analyzed:**	**Material Matrix:** Air / Bulk / Water
1	1	Bulk

Please indicate appropriate turn around time.

Asbestos: *please call ahead for availability of all rush and/or after hours samples*

TEM	TA Time	PLM	TA Time	Optical / IAQ	TA Time
Circle analysis and select TA time		*Circle analysis and select TA time*	2 hour	**PCM**: NIOSH 7400	Note TAT
AHERA	4 hour	**EPA 600 XXXX**	4 hour	**Allergen Particle**:	24 hour
EPA Level II	8 hour		8 hour	tape/bulk/swab	2 days
Drinking Water	16 hour		16 hour	Cyclex-d cassettes	3 days
Wipe	24 hour	AHERA	24 hour	Air-o-cell cassettes	5 days
Micro-vac	2 days		2 days	Anderson cultures	Specify
NIOSH 7402	3 days	Point Count -	3 days	Bulk/swab cultures	Mold or
Chatfield Bulk	5 days	(NESHAPS)	5 days	Bacteria cultures	bacteria

Lead: ***Circle analysis and select TA time***

Matrix:	Paint Chips	Soil	Air	Wipes	Wastewater
TA Time:	8 hour	1 day	2 days	3 days	5 days

Sample Information:

Sample Number:	Sample Location:	Sample Description:	Sample Date/Time:
A1		BLACK DUST / DEBRIS	7/28/2021 12:30 PM

Custody Information:

Samples relinquished: _____ 7/28/2021 5:30pm
Signature / Date / Time

Samples received: _____
Signature / Date / Time

Samples relinquished: _____
Signature / Date / Time

Samples received: _____ 7.29.21 SPM
Signature / Date / Time

Appendix D

General Requirements for Remediation

The impacted areas of the building should be isolated using 6-mil polyethylene sheeting secured to building components with tape. The areas where the remedial work will occur is referred to as a containment. The contractor may divide the building into the number of containments they deem necessary to complete the scope of work. When establishing containment zones, consideration should be given to the route in which the removed material will be transported out of the building.

Each containment area should be supplied with enough air filtration devices to maintain 4 air changes per hour. Air changes may be calculated by determining the air volume within the containment area and dividing by the flow rate at which the air filtration device filters the air. Each air filtration device should be the type typically utilized in the remediation and/or abatement industry, or equivalent. The air filtration device shall be equipped with necessary pre-filters and HEPA filters to filter particulates from the air.

During the demolition phase the containments should be placed under negative pressure and ended prior to the final cleaning phase of the remediation activities. During final cleaning, the air filtration devices may be oriented to filter and recirculate the air within the containment. The air recirculate mode should operate for a minimum of 48-72 hours prior to conducting post remediation verification testing. If the project does not achieve clearance, the air scrubbers must remain and be operable until clearance is achieved.

Construction of the containments is the responsibility of the contractor. Erection of the containments will be completed to such a standard that it will withstand the pressures related to the workflow and airflow throughout the entire project.

In addition to the air filtration devices, the remediation contractor shall supply dehumidifier units to maintain humidity levels at 50% (+/-5%) in the building during the entire remediation process. If air conditioning is not supplied to the building during reconstruction, dehumidification efforts must be maintained during this project phase. Once the containments have been established, removal of the impacted materials shall commence.

The gypsum wallboard in the building that is wet, water damaged or has mold growth should be removed in accordance with mold removal and containment procedures generally used in the mold remediation industry. Care should be taken to minimize the disturbance of mold spores present on the materials removed from the building.

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Criteria for Remediation

The remediation contractor shall contain the areas where remedial activities will occur by isolating entrances with one layer of 6-mil thick polyethylene sheeting. The containment must be built using polyethylene sheeting of 6-mil thickness that is clear or opaque and moisture resistant duct tape and spray on glue capable of continuously sealing polyethylene through the project's remediation duration. If multiple containments are established, they must be isolated from each other using the polyethylene sheeting.

All openings between containment area(s) and adjacent area(s), including but not limited to windows, doorways, elevator openings, corridor entrances, ventilation openings, drains, ducts, grills, grates, diffusers, skylights, etc. shall be sealed. All cabinets, shelving etc, that have cracks, holes or other openings shall also be sealed. All movable objects shall be cleaned and removed from the containment area(s).

Where possible all HVAC equipment in or passing through any containment area shall be shut down, and preventative measures taken to prevent accidental start-ups. All intake and exhaust openings shall be sealed with at least one (1) layer of 6-mil polyethylene sheeting. The seals shall be installed in such a manner as to guarantee that the seals shall remain in place for the duration of the project.

Measures shall be taken to prevent aerosolized contaminants from escaping the work zones and into the HVAC systems of the property. The contained areas shall be placed under negative pressure containment during demolition to prevent migration of fungal contaminants into ducts or adjacent areas.

The containment shall be kept under negative pressure at all times during the demolition activities and for a time period after cessation of demolition that allows work area particulate levels in the air to return to background levels. Negative pressure shall be sufficient to prevent migration of particulate material out of the containment. Exhaust from the device(s) providing negative pressure shall be HEPA filtered and exhausted to the outdoors. The containment area exhaust plan will be modified to avoid and control depressurization and possible elevated interior humidity. The contractor shall demonstrate there is no bypass around the HEPA filter and that the filter provides HEPA performance. Containment areas shall maintain a negative pressurization with respect to adjoining areas of 5.0 Pa (0.02 in/water gauge) or greater during all work activities that may increase particulate concentrations. Negative pressurization shall be monitored and recorded using a device capable of measuring and recording containment depressurization, with a resolution of 1 Pa or less.

Air filtration devices shall be positioned within each containment and the air filtration devices shall be capable of producing 4 air exchanges per hour. After demolition and cleaning, air filtration can be changed from negative pressurization to recirculation. Distribute and isolate all air filtration devices throughout the affected areas. Ensure during the project that no old, contaminated or incorrectly installed filters are used to minimize post remediation testing failures or potentially cross contaminating other areas of the residence.

Air exhaust locations will be secured from criminal entry by using burglar bars or other satisfactory methods during the remediation process and protected against water intrusion during rainfall events. Provisions for make-up air should be made; dedicate a portion of a wall critical barrier for fresh make-up air. Ensure that each make-up air opening is adequately filtered. All filters shall be disposed of as contaminated waste material at the end of the project.

Ground Fault Circuit Interrupters (GFCI) are to be used on all electrical equipment within the containment. In areas where mold remediation activities are being conducted, air dehumidifiers should be utilized in a manner consistent with maintaining the relative humidity to approximately 50% (+/-5%) during the remediation/sanitization activities.

Dehumidification efforts should only cease when proper measures are in place that allow for proper temperature control and dehumidification to return to the building such as operating the air conditioning systems in the building. Dehumidification should allow for less than 14% moisture in all construction materials.

PVC or wood supporting frames shall be utilized if necessary to ensure that the containments remain intact during the entire remediation and post-remediation procedures.

Polyethylene bags of 6-mil thickness such as those used for asbestos-containing waste should be used to bag debris and waste. The designated onsite clean storage area must be outside.

Inlet openings on all vacuum collection devices and negative air machines shall be properly sealed during transport and when the equipment is not in use. Vacuum hose openings shall be sealed during transport outside of the work area. All areas should be cleaned and sanitized and new filters installed prior to beginning the project. All filters shall be disposed of as contaminated waste material at the end of this project.

HEPA vacuum flooring (carpet and/or hard floor) prior to the installation of the engineering control. Isolate all flooring (carpet and/or hard floor) with one layer of 6-millimeter polyethylene sheeting and seal with duct tape.

Interior surfaces of enclosure shall be wet-wiped or HEPA vacuumed before moving or dismantling the containment enclosure.

Removal

Upon adequate containment isolation, begin removal of the affected materials. In the event additional areas of contamination are identified, removal should continue until all areas are removed. Additionally, any exposed batt insulation that is affected should be removed. Conduct a visual inspection on any wood framing materials present and if they are affected removal should occur.

HEPA vacuum clean and wipe any exposed wall cavities. Once all the affected materials have been removed HEPA vacuum to remove remaining dust and debris from the containment. Additionally, wipe down the interior of the containment to remove any particulate matter that may statically bind to the walls of the containment.

Personnel Protection

The remediation contactor must utilize professional judgment regarding professional protection for restoration employees and follow all applicable standards and guidelines. The following information is for guidance purposes only:

- For areas of containment the use of gloves, disposable full body clothing, headgear, foot coverings, and full-face respirator with HEPA filter are required.
- Minimum Protection - half face HEPA filtered respirators, disposable suits, eye protection, gloves (e.g. polynitrile).
- Full Protection – full face HEPA filtered respirators or PAPR, full protective suits with head cover and foot covers, eye protection, gloves (e.g. polynitrile)
- The remediation contractor shall insure that OSHA appropriate personal protective equipment (PPE) is worn while remediation activities occur.
- Contractor assumes all responsibility for PPE compliance.

Remediation Contractor shall follow all of the requirements of 29 CFR 1910.120 (OSHA).

Before the project begins, the remediation contractor shall instruct workers on the potential health effects of mold and the need to use appropriate work procedures and personal protection when performing remedial techniques, including:

1. Use and fit of respirators.
2. Use of protective clothing.
3. Entry and exit from work areas.
4. Aspects of work procedures.
5. Protective measures.
6. Safety and emergency egress procedures.

Remediation Contractor shall provide workers with personally issued and marked respiratory protection equipment approved by National Institute for Occupational Safety and Health (NIOSH). As a minimum, respiratory protection during any disturbance of impacted components, shall consist of half-mask negative pressure air-purifying respirators equipped with HEPA oil proof (P100) cartridges. Disposable type dust masks are not allowed. All respiratory protection shall be provided in accordance with the remediation contractor's written respiratory protection program, which includes all applicable elements of the OSHA Respiratory Protection Standard.

Worker Certification

The remediation contractor must possess the following documents for all workers, including supervisory personnel, prior to start of project:

1. Current (within 1 year) physician's approval to wear a respirator.
2. Respirator fit test certification (within 1 year).
3. Documented mold awareness-training.

Protective Clothing

Remediation contractor shall provide workers with sufficient sets of protective disposable clothing, consisting of full-body coveralls, integral head/foot covers, and gloves in sizes to properly fit individual workers. All persons performing removal work shall don a layer of disposable clothing over street clothes or undergarments before entering the work area. Protective clothing shall be secured (for example, taped) to ensure that skin or street clothing is not exposed. The remediation contractor shall provide eye protection (for example, full-face respirator) and hard hats, as required by job conditions or by applicable safety regulations.

Decontamination Procedures

As described previously the remediation contractor shall ensure that each worker and authorized visitor dons respiratory protection and a layer of protective clothing (disposable coveralls, head covers, gloves, footwear) over street clothes or undergarments before entering active work areas. An active work area is defined as containment between the time in which removal of impacted material begins until the final detailed cleaning is completed. Workers and authorized visitors shall enter the work area only through a decontamination unit, which will be attached to the work area. The use of respiratory protection and protective clothing shall be required within active work areas during any potential disturbance of mold impacted components. The remediation contractor shall ensure that each worker and authorized visitor removes the layer of protective clothing and places it in an impermeable bag or container. Respirators shall be required to remain on until after the wearer exits the work area.

Remediation Contractor/Consultant Coordination

Coordination between AirMD's project manager and the remediation contractor's project manager is essential in achieving a complete, efficient and timely remediation project. The remediation contractor should immediately contact the AirMD project manager if any deviations from the scope occur including but not limited to:

- Additional water damage and/or mold amplification is encountered that may alter the scope of work.
- Wood components are encountered that remain blackened after repeated cleaning or appear to be rotted or in substantial decay. If removal of suspect materials substantially affects the scope of the work, then AirMD should be contacted immediately for resolution.
- Any time there is a concern regarding the containment area construction, extent of the demolition and/or the effectiveness of the sanitization process.

Appendix E

Standards and Reference Materials Utilized

Florida State Standards of Practice for Mold Assessors, FLDBPR

Macher, J., Ed. (1999). Bioaerosols Assessment and Control. Cincinnati, Ohio, American Conference of Governmental Industrial Hygienists.

USEPA March 2001, Mold Remediation in Schools and Commercial Buildings. E. P. Agency. Washington, D.C., United States Environmental Protection Agency.

New York City Department of Health Guidelines on *Assessment and Remediation of Fungi in Indoor Environments,* New York City Department of Health and Mental Hygiene, November 2008.

IICRC S500, 2006 Standard and Reference Guide for Professional Water Damage Restoration. Vancouver, Washington, Institute of Inspection, Cleaning and Restoration Certification.

IICRC S520, 2008, Standard and Reference Guide for Professional Mold Remediation. Vancouver, Washington, Institute of Inspection, Cleaning and Restoration Certification.

ANSI/ASHRAE Standard 62.1, 2013 Ventilation for Acceptable Indoor Air Quality. Atlanta, Georgia.

ANSI/ASHRAE Standard 55, 2013 Thermal Environmental Conditions for Human Occupancy. Atlanta, Georgia.

Center of Disease Control, 2015, Content Source National Institute for Occupational Safety and Health.
https://www.cdc.gov/niosh/topics/indoorenv/hvac.html

Bailey, H. S., 2005, Fungal Contamination: A Manual for Investigation, Remediation and Control. Jupiter, Florida, BECi.

ASTM D7338-10, January 2011, Standard Guide for Assessment of Fungal Growth in Buildings.

Kendrick, B, 2001, The Fifth Kingdom. Newburyport, Massachusetts, Focus Publishing.

NADCA ACR 2013: Assessment, Cleaning and Restoration of HVAC Systems.

de Hoog, G. S., J. Guano, J. Gene, M. J. Figueras. Atlas of Clinical Fungi.

Deacon, J. (2006). Fungal Biology. Oxford, UK, Blackwell Publishing.

Baxter, A Regional Comparison of Mold Spore Concentrations Outdoors and Inside "Clean" and "Mold Contaminated Southern California Buildings, 2005, JOEH.

Indoor air quality: Biological contaminants WHO Regional Publications
European Series No. 31 29 August -2 September 1988.

Senkpiel, K., Kurowski, V. and Ohgke, H. (1996) Investigation of fungal contamination of indoor air in homes of selected patients with asthma bronchiale. Zentralblatt fur Hygiene und Umweltmedizin 198, 191-203.

The International Council for Research and Innovation in Building and Construction (CIB) International Society of Indoor Air Quality and Climate (ISIAQ) ISIAQ-CIB Task Group TG 42 "Performance criteria of buildings for health and comfort" CIB number 292, 2004

Rao, C.Y., Burge, H.A. and J.C.S. Chang. "Review of Quantitative Standards and Guidelines for Fungi in Indoor Air." Journal of Air and Waste Management Association. 46(1996): 899-908.

B Singh, J., ed. Building Mycology, Management of Decay and Health in Buildings. London: Chapman and Hall, 1994.

C Health Canada. "Fungal Contamination in Public Buildings: A Guide to Recognition and Management." Ontario: Health Canada, Federal-Provincial Committee on Environmental and Occupational Health. 1995.

D Robertson, L.D. "Monitoring Viable Fungal and Bacterial Bioaerosol Concentrations to Identify Acceptable Levels for Common Indoor Environments." Indoor Built Environments. 6(1997):295-300

E Godish, T. Indoor Environmental Quality. Boca Raton: CRC Press LLC, 2001.

F Clark, G. "Assessment and Sampling Approaches for Indoor Microbiological Assessments." American Industrial Hygiene Association (IAHA): The Synergist. Nov. 2001

Bradley, P., Weekes, J., and Miller, D. "Recognition, Evaluation and Control of Indoor Mold." American Industrial Hygiene Association (IAHA): 2008

Appendix 3

Report of water quality assessment by AIRMD

August 11, 2021

Nationwide Locations
Locally Served

Corporate Headquarters:
7700 Congress Avenue
Suite 1119
Boca Raton, FL 33487

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ENVIRONMENTAL CONSULTANTS

Water Quality Sampling

Florida State University – Sandels Building
675 West Call Street,
Tallahassee, FL 32304

Purchase Order:
FS22001764

Prepared For:
Florida State University – Sandels Building
675 West Call Street,
Tallahassee, FL 32304

Date: 8/11/21

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Table of Contents

1.0 Executive Summary

AirMD is providing results to the client for the above referenced project. AirMD's objective was to conduct water quality sampling for the detection of Total coliforms, and E. coli, and evaluate the presence of Lead, Iron, Manganese, Nitrate, Nitrite, Turbidity, and pH. The project was requested as a result of building occupants want to assure there are no contaminants in the water. A site visit was completed on July 28, 2021. Sampling was conducted in the 4th floor kitchen and conference room. The information provided in this report is based upon the agreed scope relative to the reported issue(s)/claim.

The water sampling results identified that Coliforms, E. coli, Lead, Iron, Manganese, Nitrate, Nitrite and Turbidity were not present in the sample and the pH was within the federal limit. The chart in Section 4.0 of the report lists the laboratory results and comparison standards.

Drinking water regulations contain both a list of test parameters and accompanying maximum content levels (MCL). The test parameters will normally include parameters with health and/or aesthetic significance. If there is a MCL for a parameter which is not satisfied, treatment is typically required. If a parameter has a MCL, it is considered important enough to apply in the determination for treatment, whether health related or not.

Aesthetic parameters which are not satisfied will prohibit routine use of the water which can affect livability and pose health risks indirectly. Therefore, it is important to run all tests required and recommended by each local and State standard for private wells. If State or local standards are inadequate or non-existent, testing should be done in accordance with HUD's requirements which are based on EPA's Recommendation for private wells. MCL standards are applied at the drinking tap and dictate the need for treatment.

2.0 Introduction

The subject property is a university building of concrete construction with a flat roof system. In the areas assessed, split system air conditioners serve the structure and the interior walls are gypsum board while the ceilings are a combination of gypsum board and acoustic ceiling tiles. AirMD was retained to complete sampling based on building occupants want to assure there are no contaminants in the water. The agreed scope of work included collecting water quality samples. The agreed sampling areas included sampling of the 4th floor kitchen and conference room.

Note, the site visit did not include invasive testing and was specific to the scope of work described previously. Other environmental issues may exist, and areas of damage not related to the reported issue(s)/claim may also exist and are not covered under this scope of work.

The purpose of the report is to detail the findings and to present corrective measures if required based on the findings. It is very important that the necessary time be taken to read the report in its entirety.

3.0 Methodology

Water quality sampling and analysis were conducted in general accordance with Environmental Protection Agency (EPA) Method 200.8: Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry, EPA Method 300.0 determination of Inorganic Anions by Ion Chromatography, EPA 150.1 Method for pH, EPA Method 180.1: Determination of Turbidity by Nephelometry, and the EPA 9223B Standard Method for the Examination of Water and Wastewater. AirMD performed the following scope of work and sampling plan pursuant to discussions with the client(s) which included the following:

- Conduct a visual assessment of the sampling areas and conduct preparation procedures prior to sampling.
- Collect water quality samples using sterilized bottles of known size to collect the sample(s).
- Submit samples under chain of custody for analysis to EMSL Analytical, Inc located in Orlando, FL. The laboratory analyzed the samples using Inductively Coupled Plasma-Mass Spectrometry, Ion Chromatography, and Nephelometry.
- Interpret the analytical results. Compare the results to the Environmental Protection Agencies (EPA) maximum contaminant levels for drinking water.
- Provide a written summary of results report.

4.0 Results

Analyte	Method	Reporting Limit	Federal Limit	Result
Total Coliform	SM9223B	1 CFU/100mL	Absent	Absent
E. coli	SM9223B	1 CFU/100mL	Absent	Absent
Lead	EPA 200.8	0.0010 mg/L	0.015 mg/L	None Detected
Iron	EPA 200.8	0.10 mg/L	0.30 mg/L	None Detected
Manganese	EPA 200.8	0.0010 mg/L	0.050 mg/L	None Detected
Nitrate	EPA 300.0	0.50 mg/L	10 mg/L	None Detected
Nitrite	EPA 300.0	0.50 mg/L	1.0 mg/L	None Detected
Turbidity	EPA 180.1	0.30 NTU	1.0 NTU	None Detected
pH	EPA 150.1	N/A	6.5 - 8.5	7.63

The water sampling results identified that Coliforms, E. coli, Lead, Iron, Manganese, Nitrate, Nitrite and Turbidity were not present in the sample and the pH was within the federal limit.

AirMD used its best professional judgment and followed industry standards in completing the project. The results are valid at the time of sample collection and do not guarantee that conditions in the future will not cause changes.

Sincerely,

Rachael Rupp
Senior Consultant

Limitations: AirMD's test results do not guarantee that the indoor environment is free from contaminates, gases, organisms or analytes sampled for. The customer understands that the there are limitations associated with the instrumentation used associated with accuracy, precision, and uncertainty. Additionally, further limitations are present because of sampling and measurement methods/procedures utilized in testing and measuring as well as any or all other factors such as environmental and climatic conditions. Control samples such as duplicates, blanks and comparison samples were all considered as part of the sampling plan and those implemented were based on the agreement with the client with considerations made relative to economic factors. The customer is aware that destructive testing was not performed and the customer understands that the assessment and testing/measurements completed, and the results generated as a result of the assessment and testing/measuring are representative of conditions found at the time and that conditions can change over time. Customer understands that the test results do not guarantee that the indoor environment is free from contaminates, gases, organisms or analytes sampled for. Customer herby acknowledges that microbiological growth reoccurs if the root cause or source of the growth is not remedied and that no investigation can absolutely rule out the existence of any microbiological growth at any given site. AirMD retains the right to supplement this report should additional information become available and/or further issues are discovered. AirMD reserves the right to assess the potential impact of the new information on the findings and to revise the report, if necessary, as warranted by the information or discovery. In some instances, as a service to the client, AirMD may provide advice with respect to selecting other such contractors and assistance in monitoring their performance. In no event will AirMD assume any liability or responsibility for the work performed by other contractors.

Customer understands that the testing/measuring or overall activities completed by AIRMD and their representatives does not generate or contribute to levels of contaminates, pollutants, toxins or hazardous substances. All reports, plans, specifications, computer files, field data, notes and other documents and instruments prepared by AirMD as instruments of service shall remain the property of AirMD. AirMD shall retain all common law, statutory and other reserved rights, including the copyright thereto. AirMD is not responsible for advising Client about its reporting obligations and Client agrees that it shall be responsible for all reporting, unless AirMD has an independent duty to report under applicable law. Except as otherwise specifically provided herein, AirMD makes no express or implied warranties or guarantees of any kind, including but not limited to any implied warranties of merchantability or fitness for a particular purpose, all of which are hereby expressly disclaimed. In no event shall AirMD be liable to Customer or any third party for any incidental, consequential indirect, special or punitive damages arising out of or in connection with the services to be performed by AirMD. In no event shall AirMD be liable to Customer or any third party for any amounts in excess of the amounts received by AirMD from Customer hereunder. For all other liabilities arising from or related to AirMD's services, AirMD's total obligation to client shall be to reperform its services that do not meet the standard of care related to the work scope completed.

AirMD's opinions as noted in the report are based on the findings and upon our professional experience with no warranty or guarantee implied. AirMD accepts no responsibility for interpretations or actions based on this report by others. The findings, results and conclusions as part of our assessment are only representative of conditions at the time of the AirMD visit and do not represent conditions at other times. This report is intended for your use only. Its data and content shall not be used or relied upon by other parties without prior written authorization of AirMD.

Appendix A

Laboratory Results

EMSL ANALYTICAL, INC.
3303 Parkway Center Court
Orlando, FL 32808
Telephone: (407)599-5887 FAX: (407)599-9063
drinkingwaterlab@emsl.com | http://www.EMSL.com

EMSL ORDER ID: 342112173
EMSL CUSTOMER ID: ARMD45

Attention: Simon Hahessy
AirMD
7700 Congress Ave
Suite 1119
Boca Raton, FL 33487

Phone: 561-245-4500
Email: simon@airmd.com

Customer PO: 2102509
EMSL Project ID:
Project Name: Florida State University Sandels 2102509

Collected: 07/28/2021 13:00
Received: 07/29/2021 10:10
Analyzed: See Results
Reported: 8/2/2021

Laboratory Report
Analytical Results Detail
FHA/VA BasicPlus Water Panel

Sampling Site: 675 W Call St Tallahassee, FL 32304 Sandels Building | Room 2426 And

Drinking Water Kit Barcode: 01210012294

Analyte	Date/Time Analyzed	Method	Reporting Limit	Units	Federal Limit	Results	Indicator
Microorganisms							
Total Coliform	7/30/2021 11:20	SM 9223B	1 CFU/100mL	_	Absent	Absent	☑
E. coli	7/30/2021 11:20	SM 9223B	1 CFU/100mL	_	Absent	Absent	☑
Metals							
Lead	7/30/2021 16:07	EPA 200.8	0.0010	mg/L	0.015	ND	☑
Iron	7/30/2021 16:07	EPA 200.8	0.10	mg/L	0.30	ND	☑
Manganese	7/30/2021 16:07	EPA 200.8	0.0050	mg/L	0.050	ND	☑
Inorganic Analytes							
Nitrate	7/29/2021 16:38	EPA 300.0	0.40	mg/L	10	ND	☑
Nitrite	7/29/2021 16:38	EPA 300.0	0.40	mg/L	1.00	ND	☑
Physical Characteristics							
pH	7/29/2021 16:57	EPA 150.1	N/A	pH units	6.5 - 8.5	7.63	☑
Turbidity*	7/29/2021 16:31	EPA 180.1	0.30	NTU	1.00	ND	☑

Interpretation Key and Definitions

⊘ Result detected at, above, or outside federal limit

⚠ Result detected below federal limit and not an exceedance; however, source should be further investigated and possibly mitigated

☑ Result not detected; or detected at or below the laboratory reporting limit

Federal limit: The maximum contaminant level (MCL) that is allowed in drinking water
mg/L: Milligrams per liter or parts per million (ppm)
ND: Not detected

CFU: Colony forming units
NTU: Nephelometric turbidity units
* Interpretation is filtration system dependent

Report Date	Report Revision	Revision Comments
8/2/2021	R0	Initial Report

Carlos Rivadeneyra, Laboratory Director
or other approved signatory

Non- Conformance Comments
ΔThe sample was received outside of the method hold time for pH.
Microbiology sample date & time prepped 7/29/21 11:20AM. Date & time analyzed 7/30/21 11:20AM.

Sampling Site	Drinking Water Kit Barcode
675 W Call St Tallahassee, FL 32304 Sandels Building | Room 2426 And Ki	01210012294

Understanding Your FHA/VA BasicPlus Water Panel Results

Contaminated drinking water is one of the oldest known public health concerns. The fact that a water supply has been used for a prolonged amount of time without reported adverse health effects is not a guarantee of its safety. Regular users of a water supply can develop a tolerance for the contaminants present within their water supply while infrequent users may become sick by drinking the same water. This informational water quality testing report compares your sample results to national standards that are defined within the United States Environmental Protection Agency's (EPA) National Primary and Secondary Drinking Water Regulations. Federal public health goals as well as state, county, municipal, and local health department regulations may recommend stricter standards for the same target contaminants. Health effect information presented within this report was gathered from EPA resources. These test results are intended to be used for informational purposes only and are not intended to be used for state or regulatory compliance.

Microorganisms

The Coliform Test

A pathogen is a disease carrying organism. Many different pathogens could be present within a water system. It is not practical to test for all pathogens; therefore, the EPA requires testing for indicator organisms, or coliform bacteria. The standard bacteriological method for assessing the safety of water for domestic use is the coliform test. "Total coliforms" refer to a group of closely related bacteria that are generally harmless. They are natural and common inhabitants of surface waters, soil, and plants. Coliform bacteria are also found within the gut of warm-blooded animals, including humans. Their presence within your drinking water suggests that there has been a breach, a failure, or another change in the integrity of your water system which could allow other pathogens to enter into your drinking water. The absence of total coliform bacteria within a water system is used as the basis for considering water safe to drink.

The *Escherichia coli* (*E. coli*) Test

Fecal coliform bacteria are a subset of total coliform bacteria. *E. coli* belongs to the fecal coliform group. The presence of *E. coli* is a good indicator of fecal contamination and of the potential presence of other waterborne pathogens that are associated with human and animal fecal contamination. The absence of *E. coli* within a water system is used as the basis for considering water safe to drink.

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Metals

Lead

Materials that contain Lead have been commonly used in the construction of water supply distribution systems and plumbing systems in homes and commercial buildings. Lead is a heavy metal that has the potential to cause numerous adverse health effects in humans. The most significant and probable health effects associated with infants and children who drink water exceeding the action level are delays in their physical or mental development. Children can display attention span deficits and learning disabilities. Adults who consume contaminated water over many years can develop high blood pressure or kidney problems. Common sources of Lead contamination are household plumbing systems (service lines, pipes, brass and bronze fixtures, and solders and fluxes). The EPA has established an action level of 0.015 mg/L for Lead in drinking water.

Iron

The secondary, recommended maximum contaminant level for iron is 0.3 mg/L. The presence of iron within our drinking water can be attributed to two primary sources: natural geologic sources and aging/corroding water distribution systems and piping. Iron-based materials such as cast iron and galvanized steel have been widely used within our distribution systems and household plumbing. One of the most frequent consumer complaints about drinking water is discoloration. Iron quantities that exceed 0.3 mg/L in drinking water can cause an unpleasant metallic taste and a rusty color. Elevated levels of iron in drinking water can stain laundered items and plumbing fixtures, damage water equipment, and reduce the effectiveness of water treatment techniques for other contaminants. Iron is an essential mineral for human health in small concentrations. Ingestion of iron from drinking water is not directly associated with adverse health effects; however, trace impurities and microorganisms that are adsorbed by iron solids may pose human health concerns. Iron analysis performed by EPA 200.8, not EPA 200.7.

Manganese

The secondary, recommended maximum contaminant level for manganese is 0.05 mg/L. Manganese is a naturally-occurring element that is commonly found in soil, air, and water. Elevated levels of manganese in drinking water can stain laundered items and plumbing fixtures with a brownish color. Like iron, manganese is an essential nutrient for humans. Adverse health effects can be caused by inadequate intake or overexposure. The main route of human exposure to manganese is ingestion of food. Manganese ingestion from drinking water is normally substantially lower when compared to manganese ingestion from food. The health effects from over-exposure to manganese are dependent upon several factors, including: the route of exposure, the chemical form, the age at exposure, and an individual's nutritional status. The nervous system has been determined to be the primary target. Many of the reports of human adverse effects from manganese exposure are cited from inhalation exposure in occupational settings. While there are substantial data supporting the neurological effects of inhaled manganese in both humans and animals, there are few data that support the association between oral exposure to manganese and toxic effects.

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Inorganic Chemicals

Nitrate/Nitrite

Nitrates and nitrites are nitrogen-oxygen chemical units which combine with various organic and inorganic compounds. Nitrates occur naturally in mineral deposits, soils, seawater and freshwater systems, the atmosphere, and in regional plant life. Nitrates are most commonly used as a fertilizer. Once nitrates are consumed, they are converted to nitrites. The toxicity of nitrate in humans is due to the body's reduction of nitrate to nitrite. Infants younger than six months of age who drink water containing nitrate in excess of the maximum contaminant level can become seriously ill. These illness symptoms include shortness of breath and Blue Baby Syndrome. If infants become ill and they do not receive treatment, their sickness can become fatal. Major sources of nitrate in drinking water include fertilizer run-off, leaching from septic tanks (sewage), and erosion of natural deposits. The EPA has set an enforceable regulation for nitrate at 10 mg/L and for nitrite at 1 mg/L.

Physical Factors

pH

pH is a numerical expression indicating the degree to which water is acidic or alkaline. pH is represented on a scale of 0 to 14 with 0 being the most acidic, 14 the most alkaline, and 7 being neutral. The secondary, recommended maximum contaminant level range for pH is 6.5 to 8.5. Both low and high pH levels are deemed undesirable due to the effects upon both water systems and taste. Low pH (acidic) levels can have a corrosive effect on metal plumbing and fixtures and can also cause Lead leaching from pipe solder and brass plumbing fixtures. Metallic taste is frequently associated with acidic water while a bitter taste may be associated with alkaline (high pH) water. High pH levels reduce the effectiveness of chlorine disinfection. High degrees of mineralization are also associated with alkaline water which leads to encrustation of water supply lines.

Turbidity

Turbidity is a measure of water clarity and it is an expression of the optical property of a water sample which causes light to be scattered and absorbed rather than passing straight through a sample. Turbidity is caused by the presence of dissolved and/or suspended matter such as microscopic organisms, soil particles (clay, silt, and sand), and other fine particles of both organic and inorganic matter. As the number of particles increase, more light is scattered and absorbed, and turbidity increases. Turbidity is used to indicate water quality and filtration effectiveness. Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites, and some bacteria. Turbidity readings are expressed as nephelometric turbidity units (NTU). For water systems using conventional or direct filtration methods, turbidity cannot exceed 1.0 NTU; turbidity must be less than or equal to 0.3 NTU in at least 95 percent of samples collected within any month. Systems that use filtration other than conventional or direct filtration must follow state limits, which at no time may exceed 5.0 NTU.

FHA/VA BasicPlus Water Panel

Sampling Site	Drinking Water Kit Barcode
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National Primary Drinking Water Regulations

Microorganisms

Contaminant	MCL[1] or TT[1] (mg/L)[2]
Cryptosporidium	TT[7]
Fecal coliform and *E. coli*	MCL[6]
Giardia lamblia	TT[7]
Heterotrophic plate count (HPC)	TT[7]
Legionella	TT[7]
Total Coliforms	5.0%[8]
Turbidity	TT[7]
Viruses (enteric)	TT[7]

Disinfection Byproducts

Contaminant	MCL[1] or TT[1] (mg/L)[2]
Bromate	0.010
Chlorite	1.0
Haloacetic acids (HAAs)	0.060
Total Trihalomethanes (TTHMs)	0.080

Inorganic Chemicals

Contaminant	MCL[1] or TT[1] (mg/L)[2]
Antimony	0.006
Arsenic	0.010
Asbestos (fibers > 10 micrometers)	7 million fibers per liter (MFL)
Barium	2.0
Beryllium	0.004
Cadmium	0.005
Chromium (total)	0.1
Copper	TT[5]; Action level = 1.3
Cyanide (as free cyanide)	0.2
Fluoride	4.0
Lead	TT[5]; Action level = 0.015
Mercury (inorganic)	0.002
Nitrate (measured as Nitrogen)	10.0
Nitrite (measured as Nitrogen)	1.0
Selenium	0.05
Thallium	0.002

Disinfectants

Contaminant	MCL[1] or TT[1] (mg/L)[2]
Chloramines (as Cl_2)	MRDL=4.0[1]
Chlorine (as Cl_2)	MRDL=4.0[1]
Chlorine dioxide (as ClO_2)	MRDL=0.8[1]

Radionuclides

Contaminant	MCL[1] or TT[1] (mg/L)[2]
Alpha photon emitters	15 picocuries per liter (pCi/L)
Beta photon emitters	4 millirems per year
Radium ^{226} and Radium ^{228} (combined)	5 pCi/L
Uranium	30 ug/L

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National Primary Drinking Water Regulations

Organic Chemicals

Contaminant	MCL[1] or TT[1] (mg/L)[2]
Acrylamide	TT[4]
Alachlor	0.002
Atrazine	0.003
Benzene	0.005
Benzo(a)pyrene (PAHs)	0.0002
Carbofuran	0.04
Carbon tetrachloride	0.005
Chlordane	0.002
Chlorobenzene	0.1
2,4-D	0.07
Dalapon	0.2
1,2-Dibromo-3-chloropropane (DBCP)	0.0002
o-Dichlorobenzene	0.6
p-Dichlorobenzene	0.075
1,2-Dichloroethane	0.005
1,1-Dichloroethylene	0.007
cis-1,2-Dichloroethylene	0.07
trans-1,2-Dichloroethylene	0.1

Contaminant	MCL[1] or TT[1] (mg/L)[2]
Dichloromethane	0.005
1,2-Dichloropropane	0.005
Di(2-ethylhexyl) adipate	0.4
Di(2-ethylhexyl) phthalate	0.006
Dinoseb	0.007
Dioxin (2,3,7,8-TCDD)	0.00000003
Diquat	0.02
Endothall	0.1
Endrin	0.002
Epichlorohydrin	TT[4]
Ethylbenzene	0.7
Ethylene dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.0004
Heptachlor epoxide	0.0002
Hexachlorobenzene	0.001
Hexachlorocyclo-pentadiene	0.05

Contaminant	MCL[1] or TT[1] (mg/L)[2]
Lindane	0.0002
Methoxychlor	0.04
Oxamyl (Vydate)	0.2
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated biphenyls (PCBs)	0.0005
Simazine	0.004
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1.0
Toxaphene	0.003
2,4,5-TP (Silvex)	0.05
1,2,4-Trichlorobenzene	0.07
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
Trichloroethylene	0.005
Vinyl chloride	0.002
Xylenes (total)	10

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National Primary Drinking Water Regulations

Notes

1 Definitions:
Maximum Contaminant Level Goal (MCLG)—The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
Maximum Contaminant Level (MCL)—The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
Maximum Residual Disinfectant Level Goal (MRDLG)—The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
Maximum Residual Disinfectant Level (MRDL)—The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microboal contaminants.
Treatment Technique (TT)—A required process intended to reduce the level of a contaminant in drinking water.
2 Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent to parts per million (ppm).
3 Health effects are from long-term exposure unless specified as short-term exposure.
4 Each water system must certify annually, in writing, to the state (using third-party or manufacturers certification) that when it uses acrylamide and/or epichlorohydrin to treat water, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows: Acrylamide = 0.05 percent dosed at 1 mg/L (or equivalent); Epichlorohydrin = 0.01 percent dosed at 20 mg/L (or equivalent).
5 Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10 percent of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.
6 A routine sample that is fecal coliform-positive or *E. coli*-positive triggers repeat samples - if any repeat sample is total coliform-positive, the system has an acute MCL violation. A routine sample that is total coliform-positive and fecal coliform-negative or *E. coli*-negative triggers repeat samples - if any repeat sample is fecal coliform-positive or *E. coli*-positive, the system has an acute MCL violation. See also Total Coliforms.
7 EPA's surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels:
• *Cryptosporidium*: 99 percent removal for systems that filter. Unfiltered systems are required to include *Cryptosporidium* in their existing watershed control provisions.
• *Giardia lamblia:* 99.9 percent removal/inactivation
• Viruses: 99.99 percent removal/inactivation
• *Legionella*: No limit, but EPA believes that if *Giardia* and viruses are removed/inactivated according to the treatment techniques in the surface water treatment rule, *Legionella* will also be controlled.
• Turbidity: For systems that use conventional or direct filtration, at no time can turbidity (cloudiness of water) go higher than 1 nephelolometric turbidity unit (NTU), and samples for turbidity must be less than or equal to 0.3 NTU in at least 95 percent of the samples in any month. Systems that use filtration other than conventional or direct filtration must follow state limits, which must include turbidity at no time exceeding 5 NTU.
• HPC: No more than 500 bacterial colonies per milliliter
• Long Term 1 Enhanced Surface Water Treatment; Surface water systems or ground water systems under the direct influence of surface water serving fewer than 10,000 people must comply with the applicable Long Term 1 Enhanced Surface Water Treatment Rule provisions (e.g. turbidity standards, individual filter monitoring, *Cryptosporidium* removal requirements, updated watershed control requirements for unfiltered systems).
• Long Term 2 Enhanced Surface Water Treatment; This rule applies to all surface water systems or ground water systems under the direct influence of surface water. The rule targets additional *Cryptosporidium* treatment requirements for higher risk systems and includes provisions to reduce risks from uncovered finished water storages facilities and to ensure that the systems maintain microbial protection as they take steps to reduce the formation of disinfection byproducts. (Monitoring start dates are staggered by system size. The largest systems (serving at least 100,000 people) will begin monitoring in October 2006 and the smallest systems (serving fewer than 10,000 people) will not begin monitoring until October 2008. After completing monitoring and determining their treatment bin, systems generally have three years to comply with any additional treatment requirements.)
• Filter Backwash Recycling: The Filter Backwash Recycling Rule requires systems that recycle to return specific recycle flows through all processes of the system's existing conventional or direct filtration system or at an alternate location approved by the state.
8 No more than 5.0 percent samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Every sample that has total coliform must be analyzed for either fecal coliforms or *E. coli*. If two consecutive TC-positive samples, and one is also positive for *E. coli* or fecal coliforms, system has an acute MCL violation.
9 Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants:
• Haloacetic acids: dichloroacetic acid (zero); trichloroacetic acid (0.3 mg/L)
• Trihalomethanes: bromodichloromethane (zero); bromoform (zero); dibromochloromethane (0.06 mg/L)

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National Primary Drinking Water Regulations

National Secondary Drinking Water Regulations are non-enforceable guidelines regarding contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. The EPA recommends secondary standards to water systems but does not require systems to comply. However, some states may choose to adopt them as enforceable standards.

Contaminant	Secondary Maximum Contaminant Level
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L

For a current list of the EPA's National Primary and Secondary Drinking Water Regulations, please visit http://water.epa.gov/drink/contaminants/upload/mcl-2.pdf. Federal public health goals as well as state, county, municipal, and local health department regulations may recommend stricter standards for the same target analyte.

FHA/VA BasicPlus Water Panel

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Consumer Links:

EPA United States Environmental Protection Agency

EPA Primary and Secondary Drinking Water Regulations
http://water.epa.gov/drink/contaminants/upload/mcl-2.pdf

Ground Water and Drinking Water
http://water.epa.gov/drink/index.cfm

Drinking Water Contaminants
http://water.epa.gov/drink/contaminants/index.cfm

Basic Information about Pathogens and Indicators in Drinking Water
http://water.epa.gov/drink/contaminants/basicinformation/pathogens.cfm

Private Drinking Water Wells
http://water.epa.gov/drink/info/well/index.cfm

Standards & Risk Management
http://water.epa.gov/drink/standardsriskmanagement.cfm

FHA/VA BasicPlus Water Panel

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Description of Analysis

Analytical Laboratory:

EMSL Analytical, Inc., (EMSL) is a national network of laboratories located in key cities throughout the USA and Canada. Established in 1981, the company has expanded its analytical services and capabilities and now operates more than thirty lab locations, all striving for excellence in providing quality laboratory services in a timely and cost competitive manner.

Our diverse staff of over 500 employees includes a wide range of expertise, educational background, and experience. These dedicated and capable employees follow the lead and standard of care demonstrated by the owner and founder of the company, Dr. Peter Frasca, who, as a hands on owner, maintains daily involvement in our laboratory operations, and dictates that our work is consistent with his EMSL Diamond Standard. This "Diamond Standard" includes the following:

- Quality Data - Strict adherence to our quality programs and regulatory requirements which comply with the ISO 17025 guidelines so that our data is tracked, managed, reported, and verified to be accurate and reliable.
- Customer Dedication - We strive to create lasting, mutually beneficial relationships with all clients. We solicit feedback from our clients and we are committed to responding quickly to any questions or concerns that may arise before, during, or after an assignment.
- Analytical Expertise - We employ highly qualified and experienced chemists, geologists, physicists, mycologists, microbiologists, biologists, materials scientists, and industrial hygienists to enhance our analytical abilities and expertise.
- Integrity and Ethics - We insist that our employees uphold the highest ethics and standards. We maintain a "no compromise" policy as it pertains to any ethical issue.
- Responsiveness - We recognize that the timeliness of a report is as important as the quality of the data. We will not however, allow deadlines or the rush needs of a project to adversely impact our quality objectives.
- Technology - We recognize the importance of new technology to better enable us to provide improved service. LabConnect™ access to your data, customized reports, Laboratory Information Management Systems, and analytical instrumentation are continuously upgraded to enable continuous improvement of our service and capabilities.
- Value - We believe that a business relationship with EMSL provides you with an excellent value. We provide you with a complete value package that includes all components of the EMSL Diamond Standard.

LOCALLY FOCUSED, NATIONALLY RECOGNIZED

UNMATCHED CAPACITY FROM OUR COLLECTIVE STRENGTH OF NATIONWIDE LOCATIONS

EMSL Analytical, Inc. has been fortunate to be able to maintain a solid history of stable growth and viability for the past thirty years with a current network consisting of greater than thirty laboratories and service centers.

For a complete list of analytical services offered, please contact EMSL Analytical, Inc. at (800) 220-3675.

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Important Terms, Conditions, and Limitations

A. General Customer Requirements

The customer is responsible for confirming and communicating any specific local, state, regional, national, or independent third party certification and accreditation requirements applicable to sample submission. The customer is responsible for communicating any specific test requirements. EMSL Analytical, Inc. (EMSL) is not responsible for customer's errors or omissions with respect to communication of specific test requirements.

B. Sample Submission

The receipt of a Chain of Custody (COC) document shall be considered the customer's formal notice to proceed with the stated transaction in accordance with EMSL Terms and Conditions. In the absence of an additional contract or agreement with EMSL, by submitting samples for analysis, the customer agrees to be bound by EMSL's Terms and Conditions. Where applicable, samples shall be logged in and charged at the appropriate turnaround time rate in order to meet hold time requirements. Clients who use EMSL's prepaid courier services and/or common carrier may have a fee added to their project invoice to cover the costs if per shipment analysis fee ($) minimums are not met.

C. Sampling Responsibility

It is the customer's responsibility to ensure that samples are collected according to the appropriate regulations/method specifications. The user of a sampling device has the sole responsibility
to select the applicable sampler, media, and conditions to ensure that a valid sample has been collected. EMSL is not responsible for the improper selection of sampling devices even if EMSL supplies the devices to the user. Clients who order complementary media and supplies maybe charged for supplies not returned to the lab for analysis; including: cost of supplies, shipping and/or handling fee(s).

D. Sample Labeling & Packaging

It is the customer's responsibility to ensure that samples are labeled, packaged, and shipped according to the appropriate regulations/method specifications. Samples classified as Hazardous, Explosive, DEA regulated, FDA, Radiological/DOE, USDA Controlled or anything that requires special precautions when handling must be properly identified, pre-approved by the lab for submittal, and may incur additional surcharges for handling and disposal. EMSL reserves the right to refuse or return samples submitted for analysis which are unsuitable due to damage, leakage, incorrect or insufficient labeling, or that may be considered hazardous to our personnel or facility.

E. Turnaround Time

Turnaround Time (TAT) is defined as the time between sample acceptance by an authorized EMSL representative at the analyzing laboratory and analysis report completion. Turnaround time/due dates are based upon individual laboratory operational hours. TATs are offered in hours, business, or calendar days, depending upon the specific test. Submissions are accepted only during laboratory operational hours at the analyzing laboratory. Incomplete sample submissions or problematic sample conditions may result in processing and/ or TAT delays. Expedited TATs are subject to capacity restrictions and are not guaranteed to be available. Please call/pre-schedule with the laboratory to ensure capability and availability for expedited TATs. Unless otherwise approved, TAT Will Not Start and or will not be initiated for COD samples / projects until payment is received in full. If for any reason, the TAT originally requested will be missed, EMSL will automatically continue to proceed with completion of the work although at a longer TAT unless the client specifically indicates work is only contracted if the specific TAT requested and the job is to be cancelled if the TAT cannot be met.

F. Testing Policy

EMSL represents to its customers that all services provided hereunder shall be performed in accordance with industry recognized, professionally published, internally developed, and/or client stipulated testing procedures. Samples may be subcontracted, with prior customer notification and approval, to a third party laboratory that meets customer and EMSL qualification requirements. Specific test-level considerations may apply. See project quote and / or price book.

G. Pricing

EMSL pricing is periodically adjusted and EMSL reserves the right to update prices at its sole discretion at any time with notification. Unless specified in writing, quoted pricing expires if work is not submitted within 30 calendar days; otherwise quoted prices are valid for the remainder of the calendar year, but pricing may be adjusted based on the customer's non-compliance with payment terms, change in scope of work including frequency or volume, and/or non-compliance with the EMSL Terms and Conditions.

Sampling Site	Drinking Water Kit Barcode
675 W Call St Tallahassee, FL 32304 Sandels Building | Room 2426 And Ki	01210012294

Important Terms, Conditions, and Limitations

H. Payment Terms

If credit terms are approved, standard payment terms are 30 calendar days from date of laboratory invoice. Unless otherwise stated, rates are quoted in US Dollars. Interest charges will apply to all past due balances. If customer balance remains outstanding after 60 calendar days, EMSL reserves the right to refuse or suspend work, increase or update customer pricing immediately, and place the customer on Cash on Delivery (COD) status until such time as the account is made current. Additionally, customer agrees to pay any costs incurred to collect past due balances, including attorney's fees. For non-routine Special Projects, EMSL reserves the right to request a payment of up to 100% in advance of services performed. Unless otherwise approved, TAT and work will not be initiated for COD samples / projects until payment is received in full.

I. Customer Changes:

All changes in scope of work or TAT requested by the customer after sample acceptance must be confirmed by EMSL in writing; verbal change requests must be confirmed in writing. If requested change (s) results in a change in cost, the customer agrees to accept payment responsibility. In the event analysis is cancelled by the customer, EMSL will invoice for work completed to the point of cancellation notice. Additional cancellation fees may apply. EMSL is not responsible for TAT that is delayed due to customer changes. At its sole discretion, EMSL reserves the right to charge additional fees, change pricing, and / or reject samples due to: changes in scope of work, changes in quantity of samples, and changes in quality control requirements; charges for in-bound shipping, courier services, sample transfer, and sampling media; Hazardous, Explosive, DEA regulated or any other type of specialized sample as etermined by the laboratory.

J. Sample & Record Retention

See Division specific Terms and Conditions for standard sample retention times. Records are retained for 5 years, unless otherwise requested or required. Customer must notify EMSL, in
writing, at time of sample submission that samples and / or records are subject to specific regulatory retention requirements. EMSL must also be notified and approval must be obtained for any special disposal and/or any special sample storage and archive needs of the customer; additional fees may apply.

K. Disclaimer:

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.

L. Severability

If any of these Terms and Conditions is found to be illegal, invalid, or unenforceable by a court of competent jurisdiction, any remaining Terms and Conditions will remain in full force and effect. These Terms and Conditions shall be interpreted in accordance with the laws of the State of New Jersey. Written, negotiated contracts or customer specific Terms and Conditions may supersede these Terms and Conditions.

M. Headings

The headings contained herein are for convenience only, and in the event of any conflict, the text of this paragraph, rather than the headings, will control.

N. Lab Reports, QC Data Packages & Reporting Limits

Reports will be emailed as a PDF to the client and also posted on LABConnect™. Clients that are not paperless (require mailed Reports, COC's, Invoices, and/or any combination of these documents) may be subject to surcharge fees and/or increased analytical rates. QC data packages for validation programs are available upon request and for an additional fee and Laboratory must be notified and approve the request prior to the sampling event and submission. Customer shall provide specific reporting limit requirements, if required, prior to sample submission. Analytical cost may vary based upon reporting limits and / or data quality objectives.

This report has been prepared by EMSL Analytical, Inc. at the request of and for the exclusive use of the client named in this report. Completely read the important terms, conditions, and limitations that apply to this report. The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory.

Appendix B

Reference Documents

Environmental Protection Agency (EPA) Method 200.8: Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry,

Environmental Protection Agency (EPA) Method 300.0: Determination of Inorganic Anions by Ion Chromatography.

Environmental Protection Agency (EPA) Method 150.1 Method for pH.

Environmental Protection Agency (EPA) Method 180.1: Determination of Turbidity by Nephelometry.

Environmental Protection Agency (EPA) 9223B Standard Method for the Examination of Water and Wastewater.

Environmental Protection Agency (EPA). Drinking Water Regulations. https://www.epa.gov/dwreginfo/drinking-water-regulations.