July 2, 2019

Mr. Alex Baylor, Environmental Specialist via email: alex.baylor@pgcps.org
Environmental Safety Office
Prince Georges County Public Schools
Division of Supporting Services / Building Services
13306 Old Marlboro Pike
Upper Marlboro, MD 20772

RE: Indoor Air Quality (IAQ) and Mold Assessment Services
J. Frank Dent Elementary School
2700 Corning Avenue, Fort Washington, MD 20744
Contract No.: IFB 022-19; Tidewater Project No.: 5419-003

Dear Mr. Baylor:

Tidewater, Inc. (Tidewater) is pleased to present this Indoor Air Quality (IAQ) and Mold Assessment Report describing the results of the IAQ assessment and mold survey conducted by Tidewater at J. Frank Dent Elementary School located at 2700 Corning Avenue, Fort Washington, Maryland. This survey was conducted on May 16, 2019, by Tidewater's Project Manager and Certified Industrial Hygienist, Mr. Skanda Abeyesekere MS, CIH, CSP, CHMM.

The scope of work for the IAQ assessment and mold survey included:

- Visual inspections of the following areas of the school: Health Room, Main Office, Multipurpose Room, Classroom 15, Library, Classroom 5, Classroom 9, Classroom 4, Classroom 17 and Lobby of J. Frank Dent Elementary School for evidence of potential indoor air quality problems (including suspect microbial growth, water damage, chemical use/ storage, drain traps, sources of allergens/ contaminants, etc.) that may contribute to indoor air quality problems;
- Comfort parameter air testing in these same areas using direct-read measurements for temperature (T), relative humidity (RH), carbon monoxide (CO), and carbon dioxide (CO_2.) Measurements were taken for comparison with guidelines established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62.1–2016, Ventilation for Acceptable Indoor Air Quality, and The United States Environmental Protection Agency (US EPA) National Ambient Air Quality Standards (NAAQS.);
- Direct read measurements for particulate matter less than 10 microns (PM10) in these areas for comparison with guidelines established by the United States Environmental Protection Agency (US EPA.);
- Direct read measurements for Total Volatile Organic Compounds (TVOCs); and,
- Air sampling in these areas for total airborne fungal spore analysis using Allergenco-D cassettes affixed to a Buck BioAire™ Model B520 Bioaerosol Sampling Pump.

Visual Observation

Tidewater's assessment included a visual inspection of representative areas of the school including the Health Room, Main Office, Multipurpose Room, Classroom 15, Library, Classroom 5, Classroom 9, Classroom 4, Classroom 17 and Lobby of J. Frank Dent Elementary School. The results of Tidewater's visual inspection are as follows:

Health Room

The Health Room had two (2) occupants at the time of the inspection. The return air grill located on the ceiling was rusty; furthermore, the return air grill in the restroom contained excessive levels of dust. A wall-mounted fan coil unit was in the Health Room which was in operation at the time of the inspection. No signs of mold growth or past or ongoing water-intrusion problems were observed in the Health Room. Furthermore, no unusual odors were detected.

Main Office

The main office was relatively clean; however, the ceiling mounted supply and return grills were rusty and contained excessive levels of dust. The supply and return air grills located in the principal's office and in the instructional room also contained excessive levels of dust.

Multi-Purpose Room

Multipurpose Room was vacant at the time of the inspection. A large water-stain was observed in the center of the ceiling indicating signs of on-going or past water intrusion. Mild food odors were detected from the Multipurpose Room. All trash receptacles were empty and the general housekeeping appeared to be satisfactory. The return grills located on the perimeter walls of the Multipurpose Room were dusty. Multiple window-mounted air conditioning units supplied air to the Multipurpose Room.

Classroom 15

Classroom 15 had around 20 students at the time of the inspection. The air supply grills of the ceiling mounted HVAC unit contained dust deposits. Furthermore, books were stored on top of the air supply grills of the wall-mounted fan coil unit hindering air flow. General housekeeping within the classroom can improve. No signs of mold growth or past or ongoing water-intrusion problems were observed. No unusual odors were detected within the classroom.

Library

Library had around 14 students at the time of the inspection. Several window-mounted air conditioning units were in operation at the time of the inspection. The general air flow within the Library appeared to be good. No signs of mold growth or past or ongoing water-intrusion problems were observed. Furthermore, no unusual odors were detected.

Classroom 5

Classroom 5 had around 14 students at the time of the inspection. The air supply grills of the ceiling were clean. The HVAC system was in operation and cold air was emitting from the fan coil unit. The general air flow was satisfactory. General housekeeping within the classroom

was good. No unusual odors were detected. No signs of mold growth or past or ongoing water-intrusion problems were observed.

Classroom 9

Classroom 9 was vacant at the time of the inspection. The air supply grills of the ceiling were relatively clean. The fan coil unit was in operation and hot air was emitting from the fan coil unit at the time of the inspection. No unusual odors were detected. No signs of mold growth or past or ongoing water-intrusion problems were observed within Classroom 9.

Classroom 4

Classroom 4 had around seven (7) students at the time of the inspection. The air supply grills of the ceiling were clean. The fan coil unit was in operation. General housekeeping within the classroom was good. No unusual odors were detected. Furthermore, no signs of mold growth or past or ongoing water-intrusion problems were observed.

Classroom 17

Classroom 17 had over 20 students at the time of the inspection. The air supply grills of the ceiling were clean. The fan coil unit was in operation and cold air was emitting from the fan coil unit. However, the air flow appeared to be inadequate as the room appeared to be stuffy. General housekeeping within the classroom was good. No unusual odors were detected from Classroom 17. No signs of mold growth or past or ongoing water-intrusion problems were observed.

Lobby

Numerous water-stained ceiling tiles were observed in the hallway above the courtyard exit door next to the remedial reading room.

Comfort Parameter Air Testing

During the assessment, Tidewater recorded temperature, relative humidity, carbon dioxide (CO_2), and carbon monoxide (CO) measurements in the above-mentioned locations of J. Frank Dent Elementary School using a TSI Q-Track Air Quality Meter (Model Number TSI Q-Track 7565, Serial Number 7565x0931002, Calibration Date: April 18, 2019.) Measurements were taken after allowing the instrument to become acclimated to the ambient temperature and relative humidity for approximately five (5) minutes. Measurements were taken over a 5-minute time period at each designated location and the average concentration was recorded. Samples were obtained for comparison with guidelines established by the American Society for Heating Refrigeration and Air Conditioning (ASHRAE) Standard 62.1 – 2016, Ventilation for Acceptable Indoor Air Quality.

A background sample was obtained in front of the main entrance to the school building for comparison to the interior readings. The results of the IAQ comfort parameter monitoring are provided in Table 1, in **Attachment A**.

According to the American Society for Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 62.1 – 2016, the temperature range in summer months should be maintained between 73.0°F and 79.0°F for maximum occupant comfort. The ASHRAE

guideline for temperature for winter months is between 68.0°F and 74.5°F. The indoor temperature levels within the assessed areas on May 16, 2019 ranged between 66.7°F and 72.6°F, and the background temperature outside the building was 64.0°F. The temperature levels recorded within the majority of the classrooms were within the temperature levels typically observed during the spring-summer transitional period. The temperature level in the Health Room was marginally below the lower temperature guideline of 68.0°F recommended for winter months; however, this is not of concern as the Health Room was vacant at the time of the inspection. Indoor temperature levels tend to fluctuate throughout the work day based on the number of occupants present within the occupied areas. The temperature level in the Health Room will increase when it is occupied to capacity.

Per the same guideline, a maximum recommended relative humidity level of 65.0% is recommended to reduce the likelihood of condensation on cold surfaces. Relative humidity levels within the assessed areas on May 16, 2019 ranged between 43.7% and 57.2%. The background relative humidity level outside the building was 66.3%. The relative humidity levels in all areas assessed were below the ASHRAE recommended maximum relative humidity guideline of 65.0%.

ASHRAE Standard 62.1 – 2016 recommends that indoor CO_2 levels not exceed 700 ppm above the outdoor background CO_2 level. The CO_2 levels in the assessed areas on May 16, 2019 ranged between 636 ppm to 1,558 ppm. The background CO_2 level outside the building was 532 ppm. The CO_2 levels within all interior locations assessed apart from Classroom 17, did not exceed 700 ppm above the outdoor background CO_2 level of 431 ppm. The CO_2 level in Classroom 17 exceeded 700 ppm above the outdoor background CO_2 level of 431 ppm. The air exchange rates in Classroom 17 needs to be increased.

The CO levels in all areas assessed within J. Frank Dent Elementary School were below the maximum guideline of 9 ppm recommended by the Indoor Air Quality Association (IAQA) for CO in occupied indoor environments.

Particulate Matter Less than 10 Microns (PM 10)

Tidewater conducted air sampling for respirable dust particulates using a TSI® DUST TRAK DRX™ Aerosol Monitor (Serial Number 8534170101, Calibrated Date: March 1, 2019.) The TSI® DUST TRAK DRX™ Aerosol Monitor was equipped with a PM10 (10 µm) respirable impactor. Measurements were taken after allowing the device to become acclimated to the ambient temperature and relative humidity for five (5) minutes. Measurements were taken over a 5-minute time period at each designated location and the average concentration was recorded. Samples were taken for comparison with guidelines established by the EPA NAAQS.

Tidewater also obtained a background sample from outside the main entrance of the school building for comparison to the interior readings. The results of the particulate matter sampling are provided in Table 2, in **Attachment A**.

Based on the EPA National Ambient Air Quality Standard (NAAQS) for Particulate Matter, Final Rule (January 15, 2013), the 24-hour primary and secondary exposure standard for particulate matter less than 10 microns (PM10) is 150.0 micrograms per cubic meter of air (µg/m^3) or 0.150 milligrams per cubic meter of air (mg/m^3.) The results of the PM10 analysis indicate that the

average PM10 dust concentration recorded in all areas assessed in J. Frank Dent Elementary School ranged between 0.012 mg/m^3 and 0.040 mg/m^3. The average PM10 dust concentration in the background sample obtained in front of the main entrance was 0.012 mg/m^3.

The results of the PM10 monitoring indicate that the PM10 dust concentrations all areas assessed were below the EPA 24-hour primary and secondary NAAQS of 0.150 mg/m^3.

Total Volatile Organic Compound (TVOC) Air Testing

Tidewater obtained direct read measurements for Total Volatile Organic Compounds (TVOCs) using a Mini-RAE 2000 Hand Held VOC meter (Model Number MINIRAE 2000, Serial Number 110-010833, Calibration Date April 9, 2019.) Measurements were taken after allowing the device to become acclimated to the ambient temperature and relative humidity for five (5) minutes. Measurements were taken over a 5-minute time period at each sampling location and the average concentration was recorded for comparison with threshold limits recommended for typical occupied indoor environments.

A background sample was also obtained outdoors in front of the main entrance of the school building for comparison to the indoor readings. The results of the particulate matter sampling are provided in Table 3, in **Attachment A**.

There are no OSHA published guidelines for TVOCs. However, in general, the indoor air quality TVOC threshold for typical indoor occupied environments should not exceed 1,000 ppb (1.0 ppm) isobutylene units. The TVOC concentrations recorded in all assessed areas in J. Frank Dent Elementary School were below the recommend threshold level of 1.0 ppm.

Spore Trap Bioaerosol Sampling

On May 16, 2019, Tidewater collected a total of 10 spore trap air samples using Allegenco-D cassettes to characterize potential airborne fungal spores within select areas of J. Frank Dent Elementary School. A background sample was also collected outside the main entrance to the school building for comparison purposes.

Tidewater obtained the spore trap samples using Allergenco-D cassettes affixed to a Buck BioAire™ Bioaerosol Sampling Pump (Pump Model Number B520 and Serial Number B153043, Calibration Date: February 6, 2019) calibrated to a flow rate of 15.0 Liters per minute. Each sample was run for a period of five (5) minutes at each sample location to collect a total sample volume of 75.0 liters of air.

Once collected, the samples were transported to EMSL Analytical Laboratory (EMSL) located in Beltsville, Maryland for analysis. The samples were transported following rigorous chain-of-custody guidelines to ensure proper handling and delivery of the samples. EMSL is accredited in the American Industrial Hygiene Association (AIHA) Environmental Microbiology Laboratory Accreditation Program (EMLAP) and is a successful participant in AIHA's Environmental Microbiology Proficiency Analytical Testing (EMPAT) program (Laboratory Number 102891.)

The samples were analyzed via light microscopy at the standardized magnification of 600X. This technique does not allow for the differentiation between *Aspergillus* and *Penicillium* spores because they are morphologically identical. Additionally, the technique does not allow for cultivation, or the identification of spores to the species level, except in a few cases.

There are no universally accepted federal or State of Maryland standards for acceptable airborne concentrations of bioaerosols in an indoor occupational environment. In general, airborne concentrations indoors should be less than that found in the outdoor air with similar species composition. Indoor spore counts significantly greater than those detected outdoors, or the presence of large numbers of different types of spores indoors that are not found outdoors, may indicate contamination and potential indoor air quality problems.

The total mold spore counts in all samples obtained on May 16, 2019 ranged between 90 and 2,990 spores per cubic meter (spores/m^3.) The total mold spore concentration in the outdoors (background) sample was 15,060 spores/m^3. The total mold spore concentrations in all interior locations sampled were significantly below the outdoors (background) total mold spore concentration. Additionally, the fungal species observed in most interior samples were consistent with those observed in the background reference samples.

The concentration of species of the genus *Aspergillus/Penicillium* in sample JEDES-10 collected from the lobby (700 spores/m^3) was higher than the concentration detected in the background sample BG-1 (200 spores/m^3.) A*spergillus/ Penicillium* are the most common mold species that are detected in indoor air samples. Most of the hundreds of sub-species are allergenic with only a few that are toxic. This group of species will grow with only the humidity in the air as its water source.

The summary of the results for the spore trap sampling are provided in Table 4 in **Attachment A**. The laboratory analytical results, including speciation and chain of custody forms for the spore trap samples are included in **Attachment B**.

Conclusions

Based on this IAQ and mold assessment survey, Tidewater offers the following conclusions:

- Tidewater's visual inspection of the Health Room, Main Office, Multipurpose Room, Classroom 15, Library, Classroom 5, Classroom 9, Classroom 4, Classroom 17 and Lobby of J. Frank Dent Elementary School did not reveal any visible evidence of standing water, active water intrusion or visible mold growth on the walls, floors or ceiling in any of areas inspected. However, water-stained ceiling tiles were observed in the Multipurpose Room and in the hallway above the courtyard exit door next to the Remedial Reading Room.
- The return air grills and supply air grills located in the Health Room, Main Office including the Instructional Research Room and Principal's Office, and Classroom 15 were dirty and contained excessive levels of grime/ dust. General housekeeping in all classrooms can be improved;
- The Temperature, Relative humidity and CO readings recorded within the assessed areas of J. Frank Dent Elementary School were all within industry standards and guidelines;
- The CO_2 level in classroom 17 exceeded 700 ppm above the outdoor background CO_2 level of 431 ppm;

- Particulate matter sampling results indicated that the concentration of particulate matter less than 10 microns (PM10) in all areas assessed were below the EPA 24-hour primary and secondary NAAQS of 0.150 mg/m^3;
- The TVOC readings recorded in all areas assessed within J. Frank Dent Elementary School during this assessment were below the recommend threshold level of 1.0 ppm;
- The mold spore concentrations in all indoor locations sampled were significantly below the outdoors (background) total mold spore concentration and the fungal species composition were consistent with those observed in the background sample. However, the concentration of species of the genus *Aspergillus/Penicillium* in sample JEDES-10 collected from the lobby was higher than the concentration detected in the background sample potentially indicating some minor indoor contamination.

Recommendations

Based on the results of our visual inspection, Tidewater proposes the following:

- Investigate above the water-stained ceiling tiles in the Multipurpose Room and in the hallway above the courtyard exit door next to the Remedial Reading Room for any ongoing water leaks and surface mold formations. If any leaks are detected, repair them immediately. If surface mold contamination is observed, appropriate steps should be taken to remediate and sanitize the affected areas;
- Abate the water-stained ceiling tiles in the above-mentioned areas. Ensure that the perimeters of the ceiling grids are cleaned with a 10% bleach solution to eliminate exiting fungal spores prior to installing new ceiling tiles;
- Clean all return air grills and air supply grills in the Health Room, Main Office including the Instructional Research Room and Principal's Office, and Classroom 15 with a 10% bleach solution to eliminate grime buildup and potential mold spores;
- Ensure that all cleaning activities are conducted after hours when the classrooms are vacant to minimize exposure to occupants;
- Maintain good housekeeping practices in all common areas and classrooms. All common area and classrooms floors should be broom cleaned at the end of each day. Furthermore, all horizontal surfaces including desk tops, furniture, window sills and suspended light fixtures should be cleaned on a routine basis to prevent the accumulation of dust;
- Ensure the Heating Ventilation and Air Conditioning (HVAC) System supplying air to all common areas and classrooms is properly balanced per design requirements and current room use/occupancy in order to ensure adequate ventilation throughout the classrooms;
- Ensure that the ventilation systems are turned on in all classrooms and are operating at all times when the classrooms are occupied to provide sufficient air flow and ventilation to the classrooms**.** Consider running pedestal fans when the classrooms are fully occupied if the general air circulation is inadequate;

- Increase the air exchange rates to Classroom 17; and
- Ensure that the air supply vent of the fan coil unit in Classroom 15 is left unobstructed to ensure adequate air supply into the classroom.

Qualifications

Tidewater has endeavored to investigate existing conditions in representative areas of J. Frank Dent Elementary School located at 2700 Corning Avenue, Fort Washington, Maryland as they pertain to indoor air quality and mold contamination. Our conclusions and recommendations are based on the observations made on the day of our assessment, laboratory data from the time of the assessment, and information provided by both our Client and the area occupants. Actual conditions vary from day to day throughout the year.

Tidewater appreciates the opportunity to provide Industrial Hygiene consulting services for Prince Georges County Public Schools. Please contact us should any questions arise concerning this report or if we may be of further assistance.

Sincerely,
Tidewater, Inc.

Skanda Abeyesekere, MS, CIH, CSP, CHMM
Project Manager

Jonathan N. Schatz, MS
Manager, IH Services

SA/JNS

Attachments: **Attachment A – Summary of Comfort Parameters, Total (Nuisance) Dust, TVOC and Non-Viable Spore Trap Sampling**
Attachment B – Laboratory Reports for Non-Viable Spore Trap Sampling
Attachment C – Calibration Certificates
Attachment D – Qualifications
Attachment E – Floor Plan with Sampling Locations

Attachment A

Summary of Comfort Parameters, Total (Nuisance) Dust, TVOC and Non-Viable Spore Trap Sampling

Table 1: Indoor Air Quality Comfort Parameters J. Frank Dent Elementary School				
Location	**Temperature (°F)**	**Carbon Dioxide (ppm)**	**Relative Humidity (%)**	**Carbon Monoxide (ppm)**
May 16, 2019				
Health Room	**66.7**	645	53.1	0.0
Main Office	69.0	673	50.2	0.0
Multipurpose Room	69.7	636	48.0	0.0
Classroom 15	71.0	941	50.5	0.0
Library	71.7	706	45.6	0.0
Classroom 5	70.6	765	49.7	0.0
Classroom 9	72.6	647	43.7	0.0
Classroom 4	70.8	669	47.6	0.0
Classroom 17	70.0	**1,558**	57.2	0.0
Lobby	70.6	645	52.0	0.0
Background	64.0	532	66.3	0.0

*Numbers highlighted in red indicates locations in which temperature, carbon dioxide or relative humidity levels were either above or below the guidelines recommended by the American Society for Heating Refrigeration and Air Conditioning (ASHRAE) Standard 62.1 – 2016.

Table 2: Particulate Matter Less than 10 Microns (PM10) J. Frank Dent Elementary School	
Location	**Particulate Matter (PM10)** **Concentration (mg/m^3)**
May 16, 2019	
Health Room	0.030
Main Office	0.040
Multipurpose Room	0.020
Classroom 15	0.025
Library	0.018
Classroom 5	0.020
Classroom 9	0.012
Classroom 4	0.022
Classroom 17	0.018
Lobby	0.025
Background (Outdoors)	0.012

Table 3: Total Volatile Organic Compounds (TVOCs) J. Frank Dent Elementary School	
Location	**Concentration (ppm)**
May 16, 2019	
Health Room	0.0
Main Office	0.0
Multipurpose Room	0.0
Classroom 15	0.0
Library	0.0
Classroom 5	0.0
Classroom 9	0.0
Classroom 4	0.0
Classroom 17	0.0
Lobby	0.0
Background (Outdoors)	0.0

Table 4: Spore Trap Sampling Results J. Frank Dent Elementary School			
May 16, 2019			
Sample Number	**Sample Location**	**Sample Volume (L)**	**Total Fungi Concentration (Counts/m^3)**
JFDES-1	Health Room	75.0	2,990
JFDES-2	Main Office	75.0	2,200
JFDES-3	Multipurpose Room	75.0	1,850
JFDES-4	Classroom 15	75.0	800
JFDES-5	Library	75.0	90
JFDES-6	Classroom 5	75.0	1,330
JFDES-7	Classroom 9	75.0	200
JFDES-8	Classroom 4	75.0	850
JFDES-9	Classroom 17	75.0	1,390
JFDES-10	Lobby	75.0	2,590
BG-1	Background (Outdoors)	75.0	15,060

* Numbers highlighted in red indicates locations where the concentrations of mold spores exceeded the concentration of mold spores detected in the background sample.

Attachment B

Laboratory Reports for Non-Viable Spore Trap Mold Sampling

EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514
Phone/Fax: (516) 997-7251 / (516) 997-7528
http://www.EMSL.com / carleplacelab@emsl.com

Order ID: 061909477
Customer ID: TIDE50
Customer PO:
Project ID:

Attn: Skanda Abeyeskere
Tidewater, Inc.
6625 Selnick Drive
Suite A
Elkridge, MD 21075

Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/16/2019
Received: 05/18/2019
Analyzed: 05/21/2019

Proj: PGCPS J. Frank Dent ES, MD 5419-003

Test Report: Allergenco-D(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	061909477-0001			061909477-0002			061909477-0003		
Client Sample ID:	JEDES-1			JEDES-2			JEDES-3		
Volume (L):	75			75			75		
Sample Location:	Heath Room			Main Office			Cafeteria		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	1	40	1.8	-	-	-
Ascospores	3	100	3.3	5	200	9.1	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	1	40	2.2
Basidiospores	62	2700	90.3	43	1900	86.4	40	1700	91.9
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	3	100	3.3	1	40	1.8	2	90	4.9
Curvularia	-	-	-	1*	10*	0.5	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	2	90	3	1*	10*	0.5	1*	10*	0.5
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Oidium	-	-	-	-	-	-	-	-	-
Triadelphia	-	-	-	-	-	-	1*	10*	0.5
Total Fungi	**70**	**2990**	**100**	**52**	**2200**	**100**	**45**	**1850**	**100**
Hyphal Fragment	-	-	-	-	-	-	1*	10*	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	2	-

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

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

Jeffrey Lau, Microbiology Laboratory Manager
or Other Approved Signatory

Initial report from: 05/22/2019 12:22:17

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.
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Order ID: 061909477
Customer ID: TIDE50
Customer PO:
Project ID:

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Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/16/2019
Received: 05/18/2019
Analyzed: 05/21/2019

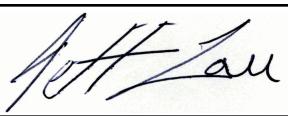
Proj: PGCPS J. Frank Dent ES, MD 5419-003

Test Report: Allergenco-D(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	061909477-0004			061909477-0005			061909477-0006		
Client Sample ID:	JEDES-4			JEDES-5			JEDES-6		
Volume (L):	75			75			75		
Sample Location:	Classroom 15			Library			Classroom 5		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	5	200	15
Aspergillus/Penicillium	2	90	11.3	-	-	-	2	90	6.8
Basidiospores	15	660	82.5	2	90	100	24	1000	75.2
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	1	40	5	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1*	10*	1.3	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Oidium	-	-	-	-	-	-	1	40	3
Triadelphia	-	-	-	-	-	-	-	-	-
Total Fungi	**19**	**800**	**100**	**2**	**90**	**100**	**32**	**1330**	**100**
Hyphal Fragment	3*	40*	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	2*	30*	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	2	-	-	2	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	2	-

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

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



Jeffrey Lau, Microbiology Laboratory Manager
or Other Approved Signatory

Initial report from: 05/22/2019 12:22:17

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com

EMSL Analytical, Inc.
528 Mineola Avenue Carle Place, NY 11514
Phone/Fax: (516) 997-7251 / (516) 997-7528
http://www.EMSL.com / carleplacelab@emsl.com

Order ID: 061909477
Customer ID: TIDE50
Customer PO:
Project ID:

Attn: Skanda Abeyeskere
Tidewater, Inc.
6625 Selnick Drive
Suite A
Elkridge, MD 21075

Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/16/2019
Received: 05/18/2019
Analyzed: 05/21/2019

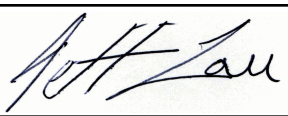
Proj: PGCPS J. Frank Dent ES, MD 5419-003

Test Report: Allergenco-D(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	061909477-0007			061909477-0008			061909477-0009		
Client Sample ID:	JEDES-7			JEDES-8			JEDES-9		
Volume (L):	75			75			75		
Sample Location:	Classroom 9			Classroom 4			Classroom 17		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	1	40	4.7	2	90	6.5
Aspergillus/Penicillium	-	-	-	4	200	23.5	1	40	2.9
Basidiospores	5	200	100	13	570	67.1	21	920	66.2
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	1	40	4.7	7	300	21.6
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	1	40	2.9
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Oidium	-	-	-	-	-	-	-	-	-
Triadelphia	-	-	-	-	-	-	-	-	-
Total Fungi	**5**	**200**	**100**	**19**	**850**	**100**	**32**	**1390**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	1	40	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	2	-	-	1	-	-	2	-
Background (1-5)	-	2	-	-	2	-	-	2	-

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

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



Jeffrey Lau, Microbiology Laboratory Manager
or Other Approved Signatory

Initial report from: 05/22/2019 12:22:17

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com

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Order ID: 061909477
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Attn: Skanda Abeyeskere
Tidewater, Inc.
6625 Selnick Drive
Suite A
Elkridge, MD 21075

Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/16/2019
Received: 05/18/2019
Analyzed: 05/21/2019

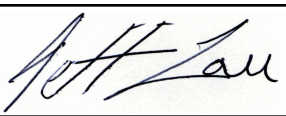
Proj: PGCPS J. Frank Dent ES, MD 5419-003

Test Report: Allergenco-D(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	061909477-0010			061909477-0011		
Client Sample ID:	JEDES-10			BG-1		
Volume (L):	75			75		
Sample Location:	Lobby			Background		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-
Ascospores	2	90	3.5	21	920	6.1
Aspergillus/Penicillium	16	700	27	5	200	1.3
Basidiospores	36	1600	61.8	319	13900	92.3
Bipolaris++	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-
Cladosporium	4	200	7.7	1	40	0.3
Curvularia	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-
Rust	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-
Oidium	-	-	-	-	-	-
Triadelphia	-	-	-	-	-	-
Total Fungi	**58**	**2590**	**100**	**346**	**15060**	**100**
Hyphal Fragment	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-
Pollen	-	-	-	2	90	-
Analyt. Sensitivity 600x	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	2	-	-	1	-
Background (1-5)	-	2	-	-	1	-

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

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



Jeffrey Lau, Microbiology Laboratory Manager
or Other Approved Signatory

Initial report from: 05/22/2019 12:22:17

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com

OrderID: 061909477

Microbiology Chain of Custody

EMSL Order Number *(Lab Use Only)*:

061909477

PHONE:
FAX:

Company: Tidewater Inc.	**EMSL-Bill to:** ☐ Different ☐ Same If Bill to is Different note instructions in Comments** *Third Party Billing requires written authorization from third party*
Street: 6625 Slenick Drive, Suite A	
City: Elkridge **State/Province:** Maryland	**Zip/Postal Code:** **Country:**
Report To (Name): Skanda Abeyesekere	**Telephone #:**
Email Address: skanda@tideh2o.net	**Fax #:** **Purchase Order:**
Project Name/Number: PGCPS J. Frank Dent ES	**Please Provide Results:** ☐ FAX ☐ E-mail ☐ Mail
U.S. State Samples Taken: MD 5419-003	**Connecticut Samples:** ☐ Commercial ☐ Residential

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour ☐ 6 Hour ☒ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ☐ 1 Week ☐ 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide. TATs are subject to methodology requirements*

Non Culturable Air Samples (Spore Traps) – Test Codes

- **M001** Air-O-Cell
- **M049** BioSIS
- **M030** Micro 5
- **M173** Allegro M2
- **M003** Burkard
- **M174** MoldSnap
- **M004** Allergenco
- **M043** Cyclex
- **M176** Relle Smart
- **M032** Allergenco-D
- **M002** Cyclex-d
- **M130** Via-Cell
- **M172** Versa Trap

Other Microbiology Test Codes

- **M041** Fungal Direct Examination
- **M005** Viable Fungi ID and Count
- **M006** Viable Fungi ID and Count (Speciation)
- **M007** Culturable Fungi
- **M008** Culturable Fungi (Speciation)
- **M009** Gram Stain Culturable Bacteria
- **M010** Bacterial Count and ID – 3 Most Prominent
- **M011** Bacterial Count and ID – 5 Most Prominent
- **M013** Sewage Contamination in Buildings
- **M014** Endotoxin Analysis
- **M015** Heterotrophic Plate Count
- **M180** Real Time Q-PCR-ERMI 36 Panel
- **M018** Total Coliform (Membrane Filtration)
- **M020** Fecal *Streptococcus* (Membrane Filtration)
- **M210-215** *Legionella* Detection
- **M026** Recreational Water Screen
- **M027** Mycotoxin Analysis
- **M029** *Enterococci*
- **M019** Fecal Coliform
- **M133** MRSA Analysis
- **M028** *Cryptococcus neoformans* Detection
- **M120** *Histoplasma capsulatum* Detection
- **M033-39** Allergen Testing
- **M044** Group Allergen (Cat, Dog, Cockroach, Dustmites)
- **Other** See Analytical Price Guide

Preservation Method (Water):

Name of Sampler: SKANDA ABEYESEKERE **Signature of Sampler:**

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
Example: A1	Kitchen	Air	M001	75L	1/1/12 4:00 PM
JFDES-1	Heath Room	AIR	M032	75.0L	05/16/19
JFDES-2	main office				
JFDES-3	Multi Cafeteria				
JFDES-4	classroom 15				
JFDES-5	Library				
JFDES-6	classroom 5				
JFDES-7	classroom 9				
JFDES-8	classroom 4				
JFDES-9	classroom 17				

Client Sample # (s): 1 - **Total # of Samples:** 9

Relinquished (Client): **Date:** 05/16/19 **Time:** 12:00pm

Received (Client): K. Howarth Fed Ex **Date:** 5/17/19 **Time:** 10:15am

19 MAY 18 AM11:53

Comments:

RCVD 5/18/19 @ 11:53AM

5/21/19

OrderID: 061909477

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*):

061909477

PHONE:
FAX:

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
JFDES-10	Lobby	AIR	01032	75	05/16/2019
BG-1	Background	↓	↓ (W)	↓	↓

****Comments/Special Instructions:**

19 MAY 18 AM 11:53

RWD 5/18/19 (W) 11:53am

Page 2 of 2 pages

5/21/19

Attachment C

Calibration Certificates

FIELD ENVIRONMENTAL INSTRUMENTS, INC.
www.fieldenvironmental.com

301 Brushton Avenue
Suite A
Pittsburgh PA 15221
800-393-4009 Toll Free
(412) 436-2600 Local
(412) 436-2616 Fax

IAQ Meter Calibration Certificate

	Lot #	Expiration
Cal Standard	18-6508	4/18/2020

Carbon Monoxide Gas	**Reading ppm**	**Acceptable Range**
35 ppm	35.0	(32 - 38)

Carbon Dioxide Gas	**Reading ppm**	**Acceptable Range**
1000 ppm	1008.0	(950 - 1050)

Model	TSI Q-Trak 7565
S/N	7565x0931002
Barcode	u59038x
Order #	398188

Calibrated By: Bryce Spontak

Date of Calibration: 05/16/19

All calibrations performed by FEI conform to manufacturer's specifications. Please report any issues within 24 hours of receiving equipment.
All calibration gas used is traceable to NIST. Additional documentation is available upon request.

TSI P/N 2300157

CERTIFICATE OF CALIBRATION AND TESTING

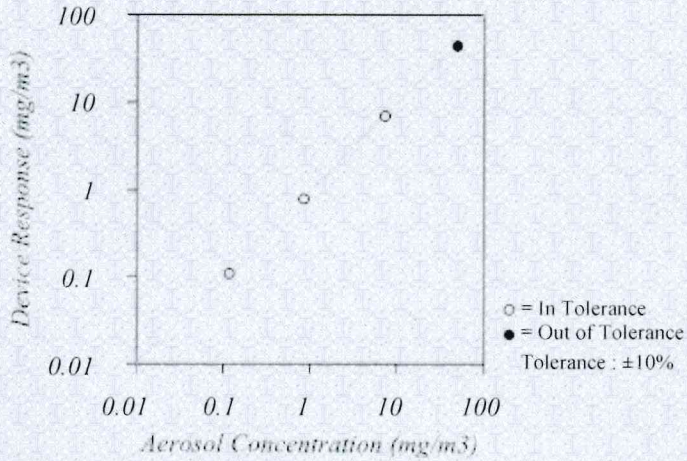
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Conditions		
Temperature	76.6 (24.8)	°F (°C)
Relative Humidity	24	%RH
Barometric Pressure	29.14 (986.8)	inHg (hPa)

Model	**8534**
Serial Number	**8534170101**

☐ As Left ☐ In Tolerance
☒ As Found ☒ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-02

FLOW AND PRESSURE VERIFICATION — **SYSTEM DTII01-02**

Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow lpm	3.0	3.0	2.85 ~ 3.15	Pressure kPa	98.6	98.6	93.71 ~ 103.57

Pump run time: 25 Hours, Pump voltage: 433 Bits

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005409	10-19-17	10-31-18
DC Voltage	E003314	05-03-17	05-31-18
Photometer	E003319	01-09-18	07-31-18
1 um PSL	679755	n/a	n/a
10 um PSL	167947	n/a	n/a
Flowmeter	E002471	04-20-17	04-30-18

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005410	10-19-17	10-31-18
DC Voltage	E003315	05-03-17	05-31-18
Microbalance	M001324	11-02-16	11-30-18
3 um PSL	180387	n/a	n/a
Pressure	E003511	10-02-17	10-31-18

Verified

March 1, 2018
Date

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services, LLC.

Tidewater MD

Instrument ID 110-010833
Description MINIRAE 2000
Calibrated 4/9/2019

Manufacturer Rae Systems
Model Number MINIRAE 2000
Serial Number 110-010833
Location Maryland
Department CATHY MOORE

Frequency 6 Months
Status Pass
Temp 24
Humidity 39

Calibration Specifications

Group # 1
Group Name ISOBUTYLENE
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	ppm	100.00	ppm	92.80	101.00	1.00%	Pass

Test Instruments Used During the Calibration (As Of Cal Entry Date)

Test Instrument ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date	Next Cal Date / Expiration Date
MD ISO 100PPM FBI-248-100-12	MD ISO 100PPM	Pine Environmental Services, Inc.	FBI-248-100-12	34LS-248-100	5/23/2022	
MD ZERO AIR FBI-1-25	ZERO AIR Oxygen 20.9%VOL, Nitrogen Balance	Pine Environmental Services, Inc.	31844	FBI-1-25		

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Ryan Armstrong

Pine Environmental Services, LLC. hereby certifies that this instrument is calibrated and functions to meet the manufacturer's specifications using NIST traceable standards, or is derived from accepted values of physical constants.

Certificate of Conformance

(X) Buck BioAire™ ( ) Buck BioSlide™

Serial number: B153043 **Date Issued:** 2-6-19

Flow Calibration

The instrument listed above is in conformance with factory specifications and the flow is set to nominal using a BUCK Calibrator which is N.I.S.T. traceable to A. P. Buck, Inc. Calibration Procedure APB-1, Ver. 6.2.

QA APPROVAL BY: Thomas J. Gravenor

A.P. BUCK, INC.
7101 Presidents Drive, Suite 110
Orlando, FL 32809
Phone: 407-851-8602 • Fax: 407-851-8910

BUCK
A.P. BUCK, INC.

Attachment D

Qualifications

ABIH®

american board of industrial hygiene®

organized to improve the practice of industrial hygiene
proclaims that

Skandakumar Harshanath Abeyesekere

having met all requirements of
education, experience and examination, and
ongoing maintenance,
is hereby certified in the

COMPREHENSIVE PRACTICE
of
INDUSTRIAL HYGIENE

and has the right to use the designations

CERTIFIED INDUSTRIAL HYGIENIST

CIH®

Certificate Number	**9928 CP**
Awarded:	**May 11, 2011**
Expiration Date:	**December 1, 2021**

Susan Ripple
Chair, ABIH

Chief Executive Officer, ABIH

BOARD OF CERTIFIED SAFETY PROFESSIONALS

affirms that

Skandakumar Abeyesekere

Has applied for, met qualifications, and passed required examination(s) and is hereby authorized to use the designation

Certified Safety Professional®

in Comprehensive Practice

So long as this certificate is not suspended or revoked and the certificant renews this authorization annually and meets Continuance of Certification requirements.

Board of Examiners in witness whereof we have here unto set our hands and affixed the Seal of the Board this 7th Day of April, 2008

Paul S Adams — President

Linda Tapp — Secretary

20110 — CSP No.

INSTITUTE OF HAZARDOUS MATERIALS MANAGEMENT

THIS CERTIFIES THAT

Skandakumar Abeyeskere

HAS SUCCESSFULLY MET ALL THE REQUIREMENTS OF EDUCATION, EXPERIENCE AND EXAMINATION, AND IS HEREBY DESIGNATED A

CERTIFIED HAZARDOUS MATERIALS MANAGER
CHMM

INSTITUTE OF HAZARDOUS MATERIALS MANAGEMENT IHMM CORPORATE SEAL 1984 DISTRICT OF COLUMBIA

May 13, 2016
DATE OF CERTIFICATION

19053
CREDENTIAL NUMBER

May 31, 2021
CERTIFICATION EXPIRES

M. Patricia Buley
ACTING EXECUTIVE DIRECTOR

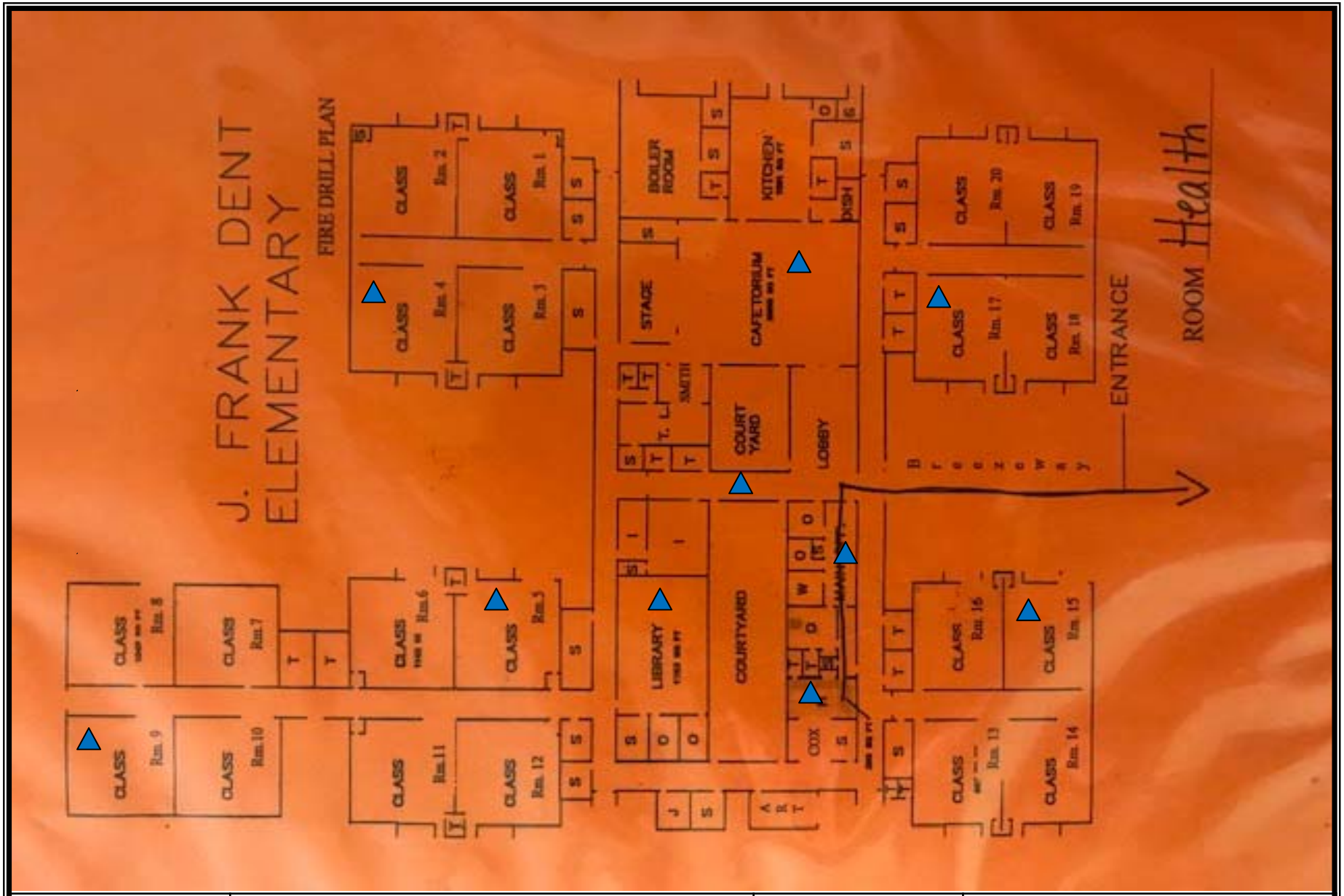
VALID SO LONG AS THIS CREDENTIAL IS RENEWED ACCORDING TO SCHEDULE AND IS NOT OTHERWISE REVOKED.

ANSI Accredited Program PERSONNEL CERTIFICATION

Accredited by the American National Standards Institute and the Council of Engineering and Scientific Specialty Boards

Attachment E

Floor Plan with Sampling Locations



TIDEWATER INC	**Attachment C** **J. Frank Dent Elementary School** **Floor Plan with Sampling Locations**	Scale: N/A Project #: 5419-003 Date: May 16, 2019	**General Notes** ▲ = Sample Location