



July 2, 2019

Mr. Alex Baylor, Environmental Specialist
Environmental Safety Office
Prince Georges County Public Schools
Division of Supporting Services / Building Services
13306 Old Marlboro Pike
Upper Marlboro, MD 20772

via email: alex.baylor@pgcps.org

**RE: Indoor Air Quality (IAQ) and Mold Assessment Services
Valley View Elementary School
5500 Danby Avenue, Oxon Hill, MD 20745
Contract No.: IFB 022-19; Tidewater Project No.: 5419-004**

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 Valley View Elementary School located at 5500 Danby Avenue, Oxon Hill, Maryland. This survey was conducted on May 20, 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: Main Office, Classroom 3, Classroom 6, Classroom 11, Classroom 10, Classroom 15, Classroom 20, Classroom 24, Classroom 27 and Library of Valley View 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 (CO₂). 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 in these areas 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 Observations

Tidewater's assessment included a visual inspection of representative areas of the school including the Main Office, Classroom 3, Classroom 6, Classroom 11, Classroom 10, Classroom 15, Classroom 20, Classroom 24, Classroom 27 and Library of Valley View Elementary School. The results of Tidewater's visual inspection are as follows:

Main Office

The main office was relatively clean. However, the ceiling mounted air supply vent was not operating. The wall-mounted HVAC unit was also not operating. The window-mounted HVAC unit in the copy room was operating and was emitting cold air at the time of the inspection.

Classroom 3

Classroom 3 had around 15 students at the time of the inspection. The classroom was stuffy due to poor air circulation. General housekeeping within the classroom can improve. No signs of past or ongoing mold growth/water-intrusion problems were observed. No odors were detected within the classroom.

Classroom 6

Classroom 6 was vacant at the time of the inspection. The wall-mounted fan coil unit was not operating at the time of the inspection and the classroom was very stuffy. An odor was also detected from the classroom at the time of the inspection. General housekeeping within the classroom can improve. No signs of mold growth or past or ongoing water-intrusion problems were observed.

Classroom 11

Classroom 11 had one (1) teacher at the time of the inspection. The air supply grills located on the ceiling contained dust deposits. The window-mounted HVAC unit was not in operation at the time of the inspection. The general air circulation within the classroom was satisfactory at the time of the inspection. General housekeeping within the classroom can improve. No signs of mold growth or past or ongoing water-intrusion problems were observed. No odors were detected within the classroom.

Classroom 10

Classroom 10 had around five (5) occupants at the time of the inspection. Two (2) window-mounted HVAC units were in operation at the time of the inspection. The air supply grills of the window-mounted HVAC units contained visible mold formations. General housekeeping within the classroom can improve. No signs of mold growth or past or ongoing water-intrusion problems were observed. No odors were detected within classroom 10.

Classroom 15

Classroom 15 had around 20 students at the time of the inspection. The window-mounted HVAC unit was in operation at the time of the inspection and the general air circulation was good. A protruding ceiling tile was observed within Classroom 15. General housekeeping within the classroom can improve. No signs of mold growth or past or ongoing water-intrusion problems were observed within the classroom. No odors were detected within the classroom.



Classroom 20

Classroom 20 was vacant at the time of the inspection. The HVAC unit was not in operation at the time of the inspection. Furthermore, the supply air grills of the HVAC system were dusty. General housekeeping within the classroom was good. No odors were detected. No signs of mold growth or past or ongoing water-intrusion problems were observed.

Classroom 24

Classroom 24 was vacant at the time of the inspection. The HVAC unit was in operation at the time of the inspection. The general air flow within the classroom was good. The supply air grills of the HVAC unit were clean. No odors were detected within Classroom 24 and no signs of mold growth or past or ongoing water-intrusion problems were observed within the Classroom.

Classroom 27

Classroom 27 was vacant at the time of the inspection. The fan coil unit was in operation and hot air was emitting from the fan coil unit. General housekeeping within the classroom was good. No odors were detected from the classroom. No signs of mold growth or past or ongoing water-intrusion problems were observed.

Library

Library was vacant at the time of the inspection. Several window-mounted air conditioning units were in operation at the time of the inspection and general air flow within the Library appeared to be good. The supply grills of the wall-mounted HVAC units contained mold formations. No signs of mold growth or past or ongoing water-intrusion problems were observed within the Library and no odors were detected.

Photos of Site conditions are included in **Attachment C**.

Comfort Parameter Air Testing

During the assessment, Tidewater recorded temperature, relative humidity, carbon dioxide (CO₂), and carbon monoxide (CO) measurements in the above-mentioned locations of Valley View 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 20, 2019 ranged between 74.1°F and 78.8°F, and the background temperature outside the building was 91.2°F. The temperature levels recorded within the majority of the classrooms were within the temperature levels typically observed during the spring-summer transitional period. Indoor temperature levels tend to fluctuate throughout the work day based on the number of occupants present within the occupied areas. The temperature levels in all vacant common areas and classrooms will increase when they are 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 20, 2019 ranged between 48.7% and 68.7%. The background relative humidity level outside the building was 53.2%. The relative humidity levels in all areas assessed apart from Classroom 6 were below the ASHRAE recommended maximum relative humidity guideline of 65.0%. The relative humidity level in Classroom 6 was 68.7% and therefore exceeded the ASHRAE recommended guideline of 65.0%. Elevated relative humidity levels can cause conditions favorable for the formation of mold.

ASHRAE Standard 62.1 – 2016 recommends that indoor CO₂ levels not exceed 700 ppm above the outdoor background CO₂ level. The CO₂ levels in the assessed areas on May 20, 2019 ranged between 555 ppm to 1,722 ppm. The background CO₂ level outside the building was 379 ppm. The CO₂ levels within all interior locations assessed apart from Classrooms 6, 15, and 27 did not exceed 700 ppm above the outdoor background CO₂ level of 379 ppm. The CO₂ levels in Classrooms 6, 15, and 27 exceeded 700 ppm above the outdoor background CO₂ level of 379 ppm and therefore indicates poor air exchange rates within these classrooms.

The CO levels in all areas assessed within Valley View 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/m³) or 0.150 milligrams per cubic meter of air (mg/m³.) The results of the PM10 analysis indicate that the average PM10 dust concentration recorded in all areas assessed in Valley View Elementary



School ranged between 0.032 mg/m³ and 0.057 mg/m³. The average PM10 dust concentration in the background sample obtained in front of the main entrance was 0.039 mg/m³.

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/m³.

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 Valley View Elementary School were below the recommend threshold level of 1.0 ppm.

Spore Trap Bioaerosol Sampling

On May 20, 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 Valley View 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 20, 2019 ranged between 240 and 1,390 spores per cubic meter (spores/m³.) The total mold spore concentration in the outdoors (background) sample was 3,160 spores/m³. 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 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 Main Office, Classroom 3, Classroom 6, Classroom 11, Classroom 10, Classroom 15, Classroom 20, Classroom 24, Classroom 27 and Library of Valley View Elementary School did not reveal any visible evidence of standing water, active water intrusion on the walls, floors or ceiling in any of areas inspected. However, dust and mold formations were observed on the supply grills of the window-mounted HVAC units in Classrooms 10, 11, 20 and the Library. General housekeeping in all classrooms can be improved. A protruding ceiling tile was observed in Classroom 15.
- The Temperature and CO readings recorded within the assessed areas of Valley View Elementary School were all within industry standards and guidelines;
- The relative humidity level in Classroom 6 exceeded the ASHRAE recommended maximum relative humidity guideline of 65.0%. Elevated relative humidity levels can cause conditions favorable for the formation of mold;
- The CO₂ levels in Classrooms 6, 15, and 27 exceeded 700 ppm above the outdoor background CO₂ level of 379 ppm and indicates poor air exchange rates within these classrooms;
- 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/m³;
- The TVOC readings recorded in all areas assessed within Valley View Elementary School during this assessment were below the recommend threshold level of 1.0 ppm; and



- 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.

Recommendations

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

- Clean all supply/return air grills of the window-mounted HVAC units in all Classrooms particularly in Classrooms 10, 11, 20 and Library with a 10% bleach solution to eliminate mold formations;
- Ensure that all cleaning activities are conducted after hours when the classrooms are vacant to minimize exposure to occupants;
- Replace the protruding ceiling tile in Classroom 15;
- 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) Systems supplying air to all common areas and classrooms are properly balanced per design requirements and current 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 Classrooms 6, 15, and 27; and
- Install a de-humidifier or adjust the HVAC system in Classroom 6 in order to maintain a relative humidity level below 65.0% per ASHRAE recommendations to minimize the potential for mold formations.

Qualifications

Tidewater has endeavored to investigate existing conditions in representative areas of Valley View Elementary School located at 5500 Danby Avenue, Oxon Hill, 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.

A handwritten signature in black ink, appearing to read "Skanda Abeyesekere".

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

A handwritten signature in black ink, appearing to read "Jonathan N. Schatz".

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 – Photographs of Site Conditions
Attachment D – Calibration Certificates
Attachment E – Qualifications
Attachment F – 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 Valley View Elementary School				
Location	Temperature (°F)	Carbon Dioxide (ppm)	Relative Humidity (%)	Carbon Monoxide (ppm)
May 20, 2019				
Main Office	78.8	920	49.1	0.0
Classroom 6	77.1	1,632	68.7	0.0
Classroom 10	74.4	1,055	57.2	0.0
Classroom 11	74.1	1,036	53.9	0.0
Classroom 3	76.5	926	63.6	0.0
Classroom 15	75.0	1,722	51.6	0.0
Classroom 20	76.1	906	52.8	0.0
Classroom 24	74.1	640	48.7	0.0
Classroom 27	74.4	1,357	57.6	0.0
Library	76.1	555	57.5	0.0
Background	91.2	379	53.2	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) Valley View Elementary School	
Location	Particulate Matter (PM10)
	Concentration (mg/m³)
May 20, 2019	
Main Office	0.038
Classroom 6	0.057
Classroom 10	0.039
Classroom 11	0.035
Classroom 3	0.043
Classroom 15	0.033
Classroom 20	0.036
Classroom 24	0.032
Classroom 27	0.040
Library	0.037
Background (Outdoors)	0.039



Table 3: Total Volatile Organic Compounds (TVOCs) Valley View Elementary School	
Location	Concentration (ppm)
May 20, 2019	
Main Office	0.0
Classroom 6	0.0
Classroom 10	0.0
Classroom 11	0.0
Classroom 3	0.0
Classroom 15	0.0
Classroom 20	0.0
Classroom 24	0.0
Classroom 27	0.0
Library	0.0
Background (Outdoors)	0.0



Table 4: Spore Trap Sampling Results Valley View Elementary School			
May 20, 2019			
Sample Number	Sample Location	Sample Volume (L)	Total Fungi Concentration (Counts/m³)
VVES-1	Main Office	75.0	240
VVES-2	Classroom 3	75.0	460
VVES-3	Classroom 6	75.0	1,150
VVES-4	Classroom 11	75.0	480
VVES-5	Classroom 10	75.0	440
VVES-6	Classroom 15	75.0	200
VVES-7	Classroom 20	75.0	680
VVES-8	Classroom 24	75.0	1,290
VVES-9	Classroom 27	75.0	1,390
VVES-10	Library	75.0	670
BG-1	Background (Outdoors)	75.0	3,160

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



TIDEWATER INC

ENGINEERS / SCIENTISTS / PROGRAM MANAGERS

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: 061909641
 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: 05/20/2019
 Received: 05/21/2019
 Analyzed: 05/22/2019

Proj: Valley View Elementary 5419-004 School

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

Lab Sample Number: Client Sample ID: Volume (L): Sample Location:	061909641-0001 VVES-1 75 Main office			061909641-0002 VVES-2 75 Room 3			061909641-0003 VVES-3 75 Room 6		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria (Ulocladium)	1*	10*	4.2	1*	10*	2.2	-	-	-
Ascospores	1	40	16.7	1	40	8.7	4	200	17.4
Aspergillus/Penicillium	3	100	41.7	7	300	65.2	15	660	57.4
Basidiospores	2	90	37.5	-	-	-	5	200	17.4
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	3	100	21.7	2	90	7.8
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	1*	10*	2.2	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	7	240	100	13	480	100	26	1150	100
Hyphal Fragment	-	-	-	2	90	-	2	90	-
Insect Fragment	-	-	-	-	-	-	2	90	-
Pollen	1*	10*	-	-	-	-	-	-	-
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.

Jeffrey Lau, Microbiology Laboratory Manager
 or Other Approved Signatory

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

Samples received in good condition unless otherwise noted. High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. 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. Interpretation and use of test results are the responsibility of the client. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

Initial report from: 05/24/2019 13:15:54

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
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Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/20/2019
Received: 05/21/2019
Analyzed: 05/22/2019

Proj: Valley View Elementary 5419-004 School

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

Lab Sample Number:	061909641-0004			061909641-0005			061909641-0006		
Client Sample ID:	VVES-4			VVES-5			VVES-6		
Volume (L):	75			75			75		
Sample Location:	Room 11			Room 10			Room 15		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	2	90	18.8	-	-	-	1	40	20
Aspergillus/Penicillium	4	200	41.7	5	200	45.5	1	40	20
Basidiospores	2	90	18.8	5	200	45.5	3	100	50
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	1*	10*	5
Cladosporium	3	100	20.8	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	1	40	9.1	-	-	-
Myxomycetes++	-	-	-	-	-	-	1*	10*	5
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	11	480	100	11	440	100	7	200	100
Hyphal Fragment	-	-	-	-	-	-	-	-	-
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	-	-	2	-	-	1	-
Background (1-5)	-	1	-	-	2	-	-	2	-

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

Jeffrey Lau, Microbiology Laboratory Manager
or Other Approved Signatory

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

Samples received in good condition unless otherwise noted. High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. 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. Interpretation and use of test results are the responsibility of the client. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

Initial report from: 05/24/2019 13:15:54

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: 061909641
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: 05/20/2019
Received: 05/21/2019
Analyzed: 05/22/2019
Proj: Valley View Elementary 5419-004 School

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

Lab Sample Number: Client Sample ID: Volume (L): Sample Location:	061909641-0007 VVES-7 75 Room 20			061909641-0008 VVES-8 75 Room 24			061909641-0009 VVES-9 75 Room 27		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	1	40	5.9	3	100	7.8	2	90	6.5
Aspergillus/Penicillium	6	300	44.1	3	100	7.8	26	1100	79.1
Basidiospores	7	300	44.1	12	520	40.3	4	200	14.4
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	1	40	5.9	13	570	44.2	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	15	680	100	31	1290	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)	-	1	-	-	1	-	-	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.

Jeffrey Lau, Microbiology Laboratory Manager
or Other Approved Signatory

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

Samples received in good condition unless otherwise noted. High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. 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. Interpretation and use of test results are the responsibility of the client. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

Initial report from: 05/24/2019 13:15:54



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Phone/Fax: (516) 997-7251 / (516) 997-7528
<http://www.EMSL.com> / carleplacelab@emsl.com

Order ID: 061909641
Customer ID: TIDE50
Customer PO:
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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: 05/20/2019
Received: 05/21/2019
Analyzed: 05/22/2019
Proj: Valley View Elementary 5419-004 School

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

Lab Sample Number:	061909641-0010			061909641-0011			
Client Sample ID:	VVES-10			BG-1			
Volume (L):	75			75			
Sample Location:	Library			Outdoors (Background)			
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	
Alternaria (Ulocladium)	-	-	-	-	-	-	-
Ascospores	1	40	6	10	440	13.9	-
Aspergillus/Penicillium	6	300	44.8	13	570	18	-
Basidiospores	5	200	29.9	26	1100	34.8	-
Bipolaris++	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-
Cladosporium	2	90	13.4	22	960	30.4	-
Curvularia	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	2	90	2.8	-
Pithomyces++	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-
Unidentifiable Spores	1	40	6	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-
Total Fungi	15	670	100	73	3160	100	
Hyphal Fragment	-	-	-	1	40	-	-
Insect Fragment	-	-	-	-	-	-	-
Pollen	-	-	-	4	200	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-
Skin Fragments (1-4)	-	2	-	-	2	-	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-
Background (1-5)	-	2	-	-	2	-	-

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

Jeffrey Lau, Microbiology Laboratory Manager
or Other Approved Signatory

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

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Initial report from: 05/24/2019 13:15:54

Microbiology Chain of Custody

EMSL Order Number (Lab Use Only):

061909641

PHONE:
FAX:

Company: Tidewater Inc.		EMSL-Bill to: <input type="checkbox"/> Different <input type="checkbox"/> Same <small>If Bill to is Different note instructions in Comments**</small>	
Street: 6625 Slenick Drive, Suite A		<i>Third Party Billing requires written authorization from third party</i>	
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: PGCP5 Valley View Elementary		Please Provide Results: <input type="checkbox"/> FAX <input type="checkbox"/> E-mail <input type="checkbox"/> Mail	
U.S. State Samples Taken: MD 5419-004 School		Connecticut Samples: <input type="checkbox"/> Commercial <input type="checkbox"/> 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 | • M173 Allegro M2 | • M004 Allergenco | • M032 Allergenco-D | • M172 Versa Trap |
| • M049 BioSIS | • M003 Burkard | • M043 Cyclcx | • M002 Cyclcx-d | |
| • M030 Micro 5 | • M174 MoldSnap | • M176 Relle Smart | • M130 Via-Cell | |

Other Microbiology Test Codes

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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: *[Signature]* Signature of Sampler: *[Signature]*

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
Example: A1	Kitchen	Air	M001	75L	1/1/12 4:00 PM
VVES-1	Main office	Air	M032	75.0	05/20/2019
VVES-2	Room 3				
VVES-3	Room 6				
VVES-4	Room 11				
VVES-5	Room 10				
VVES-6	Room 15				
VVES-7	Room 20				
VVES-8	Room 24				
VVES-9	Room 27				

Client Sample # (s): 11 Total # of Samples: 11

Relinquished (Client): *[Signature]* Date: 05/20/2019 Time: 2:00 PM

Received (Client): *[Signature]* Date: 5/21/19 Time: 1:26 PM

Comments:

*Client paid 72 hours in fine 5/21/19 11:26 PM

[Signature] 5/22/19



TIDEWATER INC

ENGINEERS / SCIENTISTS / PROGRAM MANAGERS

Attachment C

Photographs of Site Conditions

PHOTO LOG

Valley View Elementary School
5500 Danby Avenue
Oxon Hill, Maryland



Photo 1: Classroom 15 – Window-mounted HVAC system operating.



Photo 2: Classroom 15 – Protruding Ceiling Tile.

PHOTO LOG
Valley View Elementary School
5500 Danby Avenue
Oxon Hill, Maryland



Photo 3: Classroom 20 – Window Mounted HVAC Unit with dusty grills



Photo 4: Classroom 27 – Music room

PHOTO LOG

Valley View Elementary School
5500 Danby Avenue
Oxon Hill, Maryland



Photo 5: Classroom 10 – Window-mounted air conditioning unit with mold infested return grills



Photo 6: Library – Window-mounted air conditioning unit with mold infested return grills



TIDEWATER INC

ENGINEERS / SCIENTISTS / PROGRAM MANAGERS

Attachment D
Calibration Certificates



IAQ Meter Calibration Certificate

Cal Standard	Lot #	Expiration
	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.

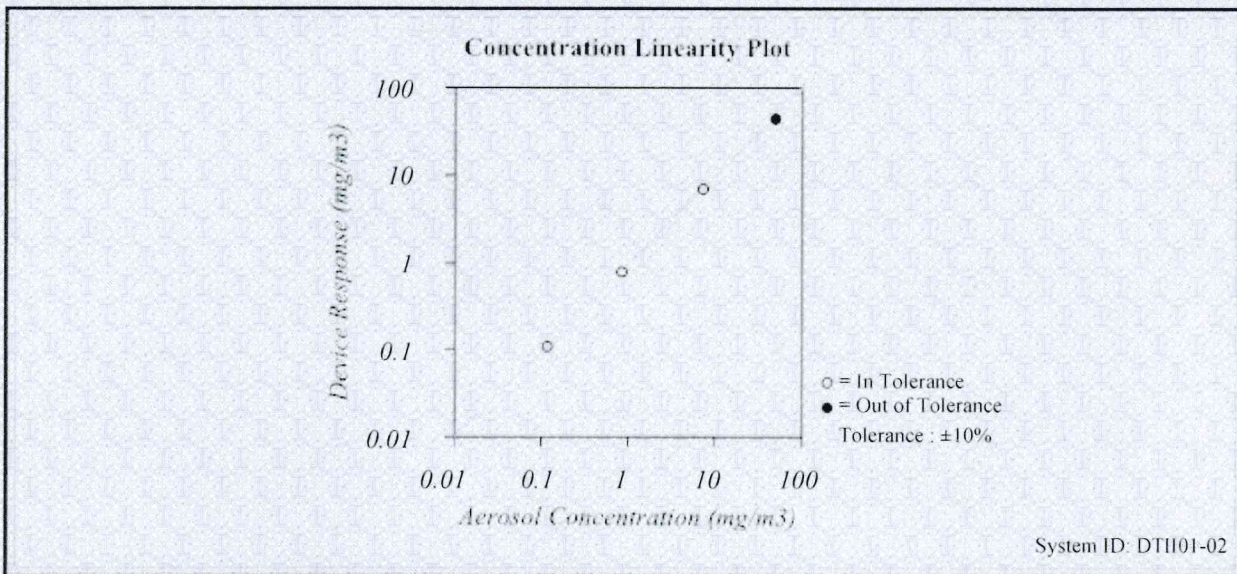


CERTIFICATE OF CALIBRATION AND TESTING

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			Model	8534
Temperature	76.6 (24.8)	°F (°C)	Serial Number	8534170101
Relative Humidity	24	%RH		
Barometric Pressure	29.14 (986.8)	inHg (hPa)		

<input type="checkbox"/> As Left	<input type="checkbox"/> In Tolerance
<input checked="" type="checkbox"/> As Found	<input checked="" type="checkbox"/> Out of Tolerance



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	Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005409	10-19-17	10-31-18	Temp/Humidity	E005410	10-19-17	10-31-18
DC Voltage	E003314	05-03-17	05-31-18	DC Voltage	E003315	05-03-17	05-31-18
Photometer	E003319	01-09-18	07-31-18	Microbalance	M001324	11-02-16	11-30-18
1 um PSL	679755	n/a	n/a	3 um PSL	180387	n/a	n/a
10 um PSL	167947	n/a	n/a	Pressure	E003511	10-02-17	10-31-18
Flowmeter	E002471	04-20-17	04-30-18				

 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

<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	<u>Out Type</u>	<u>Fnd As</u>	<u>Lft As</u>	<u>Dev%</u>	<u>Pass/Fail</u>
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)

<u>Test Instrument ID</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number / Lot Number</u>	<u>Last Cal Date</u>	<u>Next Cal Date / Expiration Date</u>
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

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. Coover

Information contained in this document should not be reproduced in any form without the written consent of A.P. Buck Inc. It is for reference only and cannot be used as a form of endorsement by any private or governmental regulatory body.

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.

COCR-004 REV-01 3/3/2006

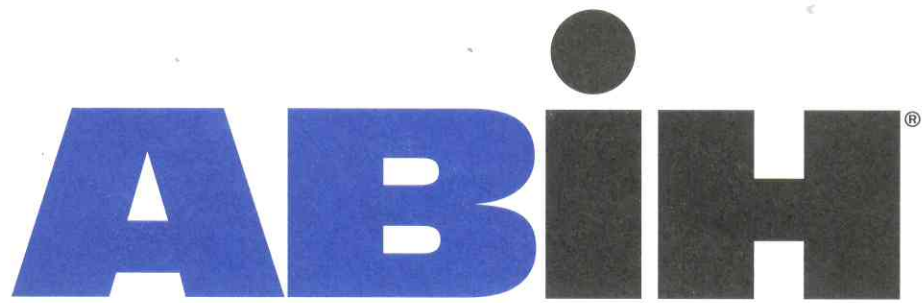


TIDEWATER INC

ENGINEERS / SCIENTISTS / PROGRAM MANAGERS

Attachment E

Qualifications



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

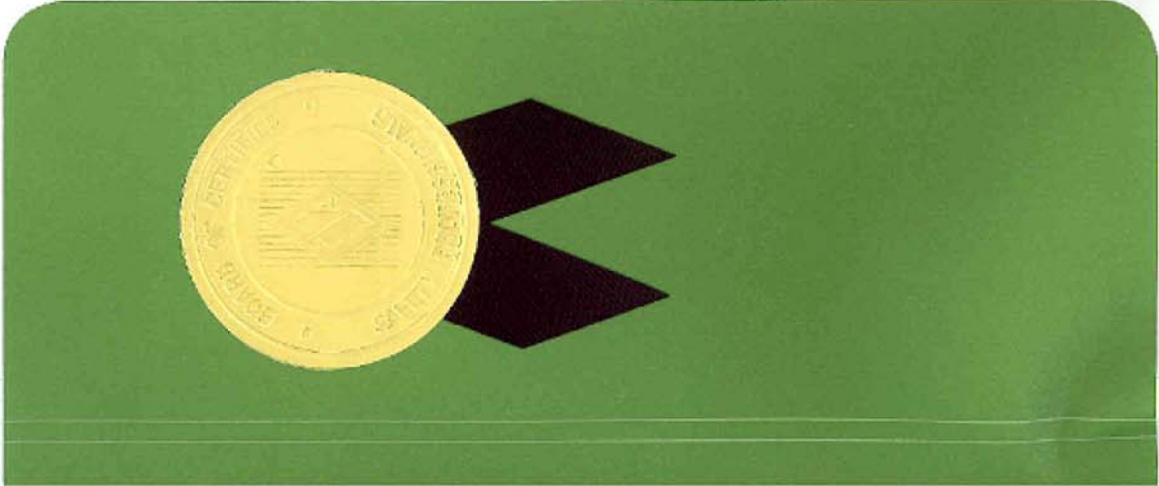
CIH

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



Susan Ripple
Chair, ABIH

William K. Oliver
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



<i>Paul S Adams</i>	President
<i>Linda Japp</i>	Secretary
20110	CSP No.



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**



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.



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





TIDEWATER INC

ENGINEERS / SCIENTISTS / PROGRAM MANAGERS

Attachment F

Floor Plan with Sampling Locations

Fire Alarm
 Main Water out off valve
 Electric panel box boiler rm

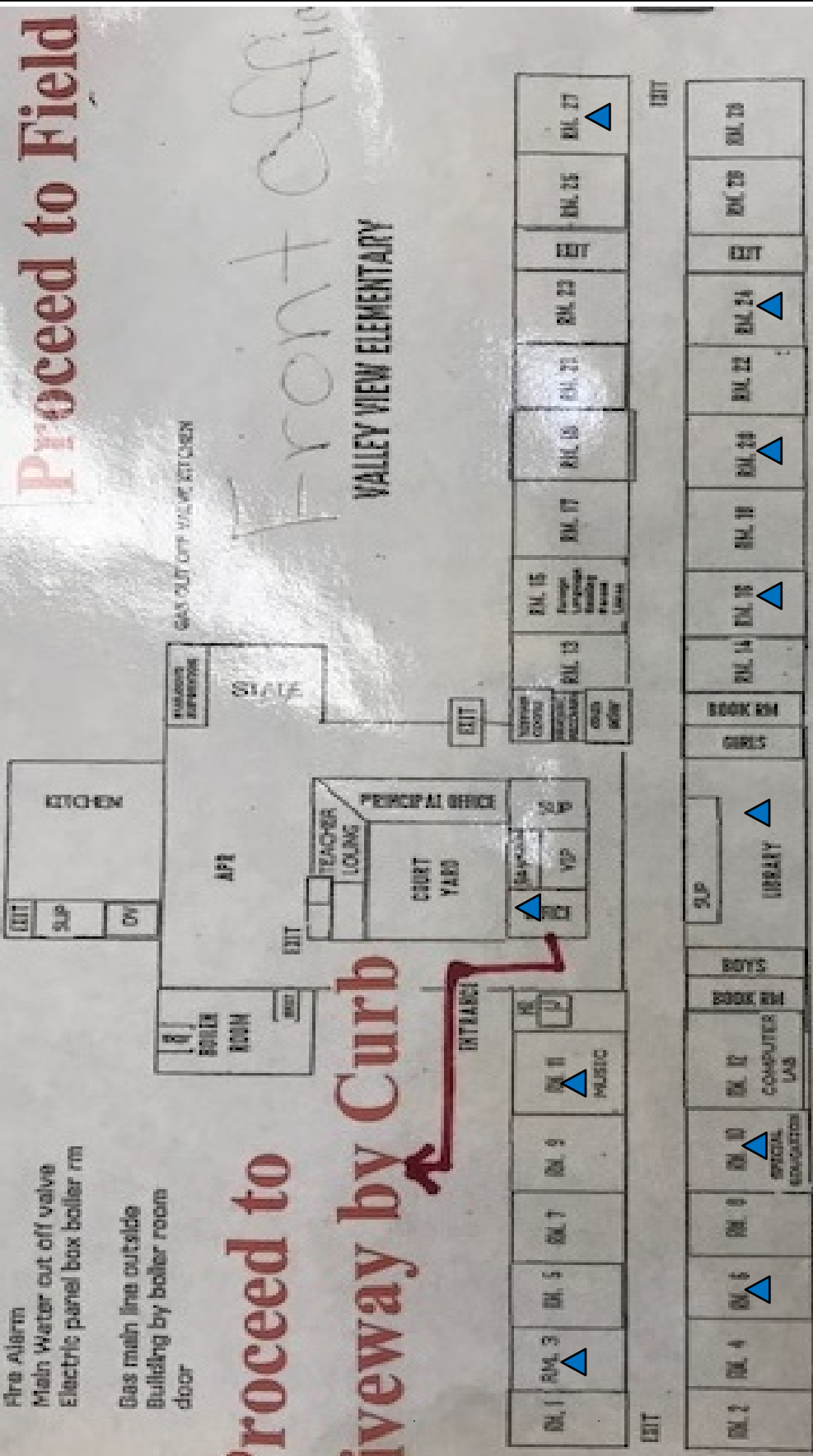
Gas main line outside
 Building by boiler room
 door

Proceed to Field


Proceed to
 riveway by Curb

Front Office

VALLEY VIEW ELEMENTARY



Proceed to Grass Area

	<p>Attachment C Valley View Elementary School Floor Plan with Sampling Locations</p>	<p>Scale: N/A Project #: 5419-004 Date: May 20, 2019</p>	<p>General Notes  = Sample Location</p>
---	--	--	---