



July 5, 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
International High School at Langley Park
5150 Annapolis Road, Bladensburg, MD 20710
Tidewater Project No.: 5419-022**

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 the International High School at Langley Park located at 5150 Annapolis Road in Bladensburg, Maryland. The IAQ and Mold survey was conducted on May 30, 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: Media Center, Classroom 121, Classroom 108, Gymnasium, Classroom 101, Classroom 215, Classroom 212, Classroom 203, Student Support Suite, Classroom 204, and Classroom 200 of the International High School at Langley Park 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 at the above areas utilizing a direct-reading IAQ monitor 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.)
- Measurement of particulate matter less than 10 microns (PM10) concentrations utilizing a direct-reading instrument at the above areas for comparison with guidelines established by the United States Environmental Protection Agency (US EPA.)
- Measurement of Total Volatile Organic Compounds (TVOCs) concentrations utilizing a direct-reading instrument at the above areas for comparison with relevant guidelines.
- Air sampling for total airborne fungal spore concentrations at the above areas using Allergenco-D cassettes affixed to a Buck BioAire™ Model B520 Bioaerosol Sampling Pump.



Visual Observations

Tidewater's assessment included a visual inspection of selected areas of the school including the Media Center, Classroom 121, Classroom 108, Gymnasium, Classroom 101, Classroom 215, Classroom 212, Classroom 203, Student Support Suite, Classroom 204, and Classroom 200 of the International High School at Langley Park. The results of Tidewater's visual inspection are as follows:

Media Room

The Media Center was vacant at the time of the inspection. The supply and return grills located on the ceiling appeared to be rusty. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. One (1) window-mounted air conditioning unit was also in operation at the time of the inspection. No signs mold growth or water-intrusion problems were observed in the Media Room. No unusual odors were detected from the Media Room. General housekeeping appeared to be satisfactory.

Classroom 121

Classroom 121 was vacant at the time of the inspection. The supply and return grills located on the ceiling appeared to be clean. Two (2) wall-mounted fan coil units were observed in the classroom. One (1) fan coil unit was in operation at the time of the inspection. No signs mold growth or water-intrusion problems were observed in the classroom. No unusual odors were detected from the classroom. General housekeeping appeared to be satisfactory.

Classroom 108

Classroom 108 was vacant at the time of the inspection. The ceiling-mounted supply and return grills appeared to be clean. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. According to school employees, the door to the classroom is kept shut at all times. No signs mold growth or water-intrusion problems were observed in the classroom. A strong mildew odor was detected from the classroom.

Gymnasium

Gymnasium was vacant at the time of the inspection. The ceiling-mounted supply and return grills appeared to be clean. The wall-mounted fan coil unit was in operation at the time of the inspection and the Gymnasium was hot and stuffy. No signs mold growth or water-intrusion problems were observed in the Gymnasium. No unusual odors were detected.

Classroom 101

Classroom 101 had over 10 students at the time of the inspection. The ceiling-mounted supply and return grills appeared to contain dust. Two (2) wall-mounted fan coil units were in operation at the time of the inspection. No signs mold growth or water-intrusion problems were observed in the classroom. No unusual odors were detected from the classroom. General housekeeping appeared to be satisfactory.

Classroom 215

Classroom 227 had two (2) students at the time of the inspection. There were no supply or return grills on the ceiling. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. No signs mold growth or water-intrusion problems were observed in the classroom. No unusual odors were detected from the classroom. General housekeeping appeared to be satisfactory.



Classroom 212

Classroom 212 had 12 students at the time of the inspection. The ceiling-mounted air supply grills appeared to be clean. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. No signs mold growth or water-intrusion problems were observed in the classroom. A food odor was detected in the classroom. General housekeeping appeared to be satisfactory.

Classroom 203 (Student Support Suite)

Classroom 203 (Student Support Suite) had multiple occupants in each room at the time of the inspection. The ceiling-mounted air supply grills in each room appeared to be clean. Wall-mounted fan coil units were operating in each room at the time of the inspection. No signs mold growth or water-intrusion problems were observed in the Suite. No unusual odors were detected. General housekeeping appeared to be satisfactory.

Classroom 204

Classroom 204 had over 10 students at the time of the inspection. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. No signs mold growth or water-intrusion problems were observed in the classroom. No unusual odors were detected from the classroom. General housekeeping appeared to be satisfactory.

Classroom 200

Classroom 200 was vacant at the time of the inspection. One (1) wall-mounted fan coil unit was in operation at the time of the inspection. No signs mold growth or water-intrusion problems were observed in the classroom. No unusual odors were detected from the classroom. General housekeeping appeared to be satisfactory.

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 International High School at Langley Park 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 recorded in the assessed areas ranged between 74.3°F and 77.7°F, and the background temperature outside the building was 81.7°F. The temperature levels recorded in all areas assessed were within the ASHRAE recommended range for summer months.



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 recorded in the assessed areas ranged between 34.3% and 65.1%. The background relative humidity level outside the building was 47.5%. The relative humidity level in Classroom 108 marginally exceeded the maximum relative humidity guideline of 65.0% recommended in ASHRAE Standard 62.1 – 2016.

ASHRAE Standard 62.1 – 2016 recommends that indoor CO₂ concentrations not exceed 700 ppm above the outdoor background CO₂ level. The CO₂ levels recorded in the assessed areas ranged between 579 ppm to 1,102 ppm. The background CO₂ level outside the building was 475 ppm. The CO₂ levels in all areas assessed did not exceed 700 ppm above the outdoor background CO₂ level of 475 ppm.

The CO concentrations recorded in all of the assessed areas 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 of the assessed areas ranged between 0.019 mg/m³ and 0.192 mg/m³. The average PM10 dust concentration in the background sample obtained in front of the main entrance was 0.026 mg/m³.

The results of the PM10 monitoring indicate that the PM10 dust concentration in the Gymnasium exceeded 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 indoor occupied 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 of the assessed areas were below the recommended threshold level of 1.0 ppm.

Spore Trap Bioaerosol Sampling

On May 30, 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 International High School at Langley Park. A background sample was also collected outside the main entrance to the school building for comparison purposes.

Tidewater obtained the spore trap samples using Allegenco-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 for the interior samples ranged between 540 and 17,210 spores per cubic meter (spores/m³.) The total mold spore concentration in the outdoors (background) sample was 25,200 spores/m³. The total mold spore concentrations in all interior locations sampled were significantly below the outdoors (background) total mold spore concentration.

Additionally, the individual fungal species concentrations observed in the interior samples were generally consistent with those observed in the background reference sample with no significant concentrations of an individual fungal species identified in the interior 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 did not reveal any evidence of standing water, active water intrusion or suspect mold growth on accessible walls, floors and ceilings in the assessed areas.
- A strong mildew odor was detected in Classroom 108.
- The supply and return grills on the ceiling in Classroom 101 contained dust deposits.
- General housekeeping in most classrooms appeared to be satisfactory.
- Temperature, CO₂, CO, and TVOC readings recorded within the assessed areas were all within industry standards and guidelines.
- The relative humidity levels in Classroom 108 marginally exceeded the maximum relative humidity guideline of 65.0% recommended in ASHRAE Standard 62.1 – 2016.
- The PM10 dust concentration in the Gymnasium exceeded the EPA 24-hour primary and secondary NAAQS of 0.150 mg/m³.
- The mold spore concentrations in all interior locations sampled were significantly below the outdoors (background) total mold spore concentration. Additionally, the individual fungal species concentrations observed in the interior samples were generally consistent with those observed in the background reference samples with no significant concentrations of an individual fungal species identified in the interior samples.

Recommendations

Based on the results of the assessment, Tidewater offers the following recommendations:

- Further investigation is warranted to identify and correct the source of the mildew odor in Classroom 108.
- Clean air supply grills and return air grills in Classroom 101 with a 10% bleach solution to eliminate dust deposits.
- The Gymnasium should be thoroughly cleaned, and the filters in the HVAC unit serving the area checked, in an attempt to reduce the airborne dust concentration,
- Ensure that all cleaning activities are conducted after hours when the above areas 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 desktops, furniture, window sills and suspended light fixtures should be cleaned on a routine basis to prevent the accumulations of dust.
- Ensure HVAC System supplying is properly balanced per design requirements and current use/occupancy in order to ensure adequate ventilation throughout the classrooms.
- Ensure 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.



- Install a de-humidifier or adjust the thermostat in the HVAC systems in Classroom 108 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 select areas of the International High School at Langley Park located at 5150 Annapolis Road in Bladensburg, Maryland as they pertain to indoor air quality. 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 International High School at Langley Park				
Location	Temperature (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)
May 30, 2019				
Media Center	75.1	58.0	629	0.0
Classroom 121	74.3	58.9	579	0.0
Classroom 108	75.9	65.1	597	0.0
Gymnasium	76.5	60.0	617	0.0
Classroom 101	76.4	47.8	1102	0.0
Classroom 215	75.4	56.4	625	0.0
Classroom 212	76.5	56.3	1006	0.0
Classroom 203	77.3	39.0	627	0.0
Classroom 204	76.7	48.7	733	0.0
Classroom 200	77.7	34.3	669	0.0
Background	81.7	47.5	475	0.0

- Numbers highlighted in red indicates locations in which relative humidity level exceeded 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) International High School at Langley Park	
Location	Particulate Matter (PM10)
	Concentration (mg/m³)
May 30, 2019	
Media Center	0.025
Classroom 121	0.026
Classroom 108	0.021
Gymnasium	0.192
Classroom 101	0.023
Classroom 215	0.020
Classroom 212	0.030
Classroom 203	0.023
Classroom 204	0.019
Classroom 200	0.020
Background (Outdoors)	0.026

- Numbers highlighted in red indicates locations where PM10 dust concentration exceeded the EPA 24-hour primary and secondary NAAQS of 0.150 mg/m³.



Table 3: Total Volatile Organic Compounds (TVOCs) International High School at Langley Park	
Location	Concentration (ppm)
May 30, 2019	
Media Center	0.0
Classroom 121	0.0
Classroom 108	0.0
Gymnasium	0.0
Classroom 101	0.0
Classroom 215	0.0
Classroom 212	0.0
Classroom 203	0.0
Classroom 204	0.0
Classroom 200	0.0
Background (Outdoors)	0.0



Table 4: Spore Trap Sampling Results International High School at Langley Park			
May 30, 2019			
Sample Number	Sample Location	Sample Volume (L)	Total Fungi Concentration (Counts/m³)
LIHS-1	Media Center	75.0	17,210
LIHS-2	Classroom 121	75.0	11,690
LIHS-3	Classroom 108	75.0	1,700
LIHS-4	Gymnasium	75.0	10,040
LIHS-5	Classroom 101	75.0	1,660
LIHS-6	Classroom 215	75.0	1,460
LIHS-7	Classroom 212	75.0	670
LIHS-8	Classroom 203	75.0	540
LIHS-9	Classroom 204	75.0	700
LIHS-10	Classroom 200	75.0	980
BG-1	Background (Outdoors)	75.0	25,200

- Highlighted Area indicates location where the concentrations of the indoor sample exceeded the level 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: 061910771
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: 05/30/2019
Received: 06/03/2019
Analyzed: 06/05/2019

Proj: PGPCS Langly International HS 5419-022

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:	061910771-0001 LIHS-1 75 Media Center			061910771-0002 LIHS-2 75 Room 121			061910771-0003 LIHS-3 75 Room 108		
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	35	1500	8.7	37	1600	13.7	6	300	17.6
Aspergillus/Penicillium	53	2300	13.4	47	2100	18	11	480	28.2
Basidiospores	300	13100	76.1	182	7940	67.9	19	830	48.8
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	6	300	1.7	1	40	0.3	2	90	5.3
Curvularia	-	-	-	1*	10*	0.1	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	1*	10*	0.1	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Total Fungi	395	17210	100	268	11690	100	38	1700	100
Hyphal Fragment	-	-	-	1	40	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	1	-

++ 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.
Samples analyzed by EMSL Analytical, Inc. Carle Place, NY

Initial report from: 06/06/2019 08:19:13

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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Attn: Skanda Abeyeskere
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Suite A
Elkridge, MD 21075

Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/30/2019
Received: 06/03/2019
Analyzed: 06/05/2019

Proj: PGCPs Langly International HS 5419-022

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

Lab Sample Number:	061910771-0004			061910771-0005			061910771-0006		
Client Sample ID:	LIHS-4			LIHS-5			LIHS-6		
Volume (L):	75			75			75		
Sample Location:	Gymnasium			Room 101			Room 215		
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	39	1700	16.9	2	90	5.4	4	200	13.7
Aspergillus/Penicillium	89	3900	38.8	24	1000	60.2	8	300	20.5
Basidiospores	93	4100	40.8	13	570	34.3	21	920	63
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	1	40	0.4	-	-	-	-	-	-
Cladosporium	8	300	3	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	1	40	2.7
Total Fungi	230	10040	100	39	1660	100	34	1460	100
Hyphal Fragment	1	40	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
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	-	-	1	-
Background (1-5)	-	3	-	-	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.
Samples analyzed by EMSL Analytical, Inc. Carle Place, NY

Initial report from: 06/06/2019 08:19:13

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: 061910771
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: 05/30/2019
Received: 06/03/2019
Analyzed: 06/05/2019

Proj: PGCPs Langly International HS 5419-022

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

Lab Sample Number:	061910771-0007			061910771-0008			061910771-0009		
Client Sample ID:	LIHS-7			LIHS-8			LIHS-9		
Volume (L):	75			75			75		
Sample Location:	Room 212			Room 203			Room 204		
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	6	1	40	7.4	3	100	14.3
Aspergillus/Penicillium	6	300	44.8	6	300	55.6	8	300	42.9
Basidiospores	4	200	29.9	4	200	37	7	300	42.9
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	3	100	14.9	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	2*	30*	4.5	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Total Fungi	16	670	100	11	540	100	18	700	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	-	-	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.
Samples analyzed by EMSL Analytical, Inc. Carle Place, NY

Initial report from: 06/06/2019 08:19:13

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



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528 Mineola Avenue Carle Place, NY 11514
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Order ID: 061910771
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 6625 Selnick Drive
 Suite A
 Elkridge, MD 21075

Phone: (410) 540-8700
Fax: (410) 997-8713
Collected: 05/30/2019
Received: 06/03/2019
Analyzed: 06/05/2019

Proj: PGCPs Langly International HS 5419-022

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

Lab Sample Number:	061910771-0010			061910771-0011		
Client Sample ID:	LIHS-10			BG-1		
Volume (L):	75			75		
Sample Location:	Room			Background		
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total
Alternaria (Ulocladium)	-	-	-	-	-	-
Ascospores	3	100	10.2	193	8420	33.4
Aspergillus/Penicillium	18	790	80.6	60	2600	10.3
Basidiospores	2	90	9.2	305	13300	52.8
Bipolaris++	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-
Cladosporium	-	-	-	16	700	2.8
Curvularia	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-
Ganoderma	-	-	-	2	90	0.4
Myxomycetes++	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-
Rust	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-
Polythrincium	-	-	-	2	90	0.4
Total Fungi	23	980	100	578	25200	100
Hyphal Fragment	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-
Pollen	1*	10*	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-
Background (1-5)	-	2	-	-	3	-

++ 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.
 Samples analyzed by EMSL Analytical, Inc. Carle Place, NY

Initial report from: 06/06/2019 08:19:13

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

Microbiology Chain of Custody

EMSL Order Number (Lab Use Only):

061910771

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: PGPCS <i>hangly International HS</i>		Please Provide Results: <input type="checkbox"/> FAX <input type="checkbox"/> E-mail <input type="checkbox"/> Mail	
U.S. State Samples Taken: MD <i>5419-022</i>		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: *SKANDA ABYESSEKERE* 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
<i>KHS-1</i>	<i>Media Center</i>	<i>ESTER</i>	<i>M032</i>	<i>75.0</i>	<i>05/30/2019</i>
<i>2</i>	<i>Room 121</i>				
<i>3</i>	<i>Room 108</i>				
<i>4</i>	<i>Gymnasium</i>				
<i>5</i>	<i>Room 101</i>				
<i>6</i>	<i>Room 215</i>				
<i>7</i>	<i>Room 212</i>				
<i>8</i>	<i>Room 203</i>				
<i>9</i>	<i>Room 204</i>				

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

Relinquished (Client): Date: *05/30/19* Time: *1:00pm*

Received (Client): Date: *6/3/19* Time: *1:45pm*

Comments:

total 6/3/19



Attachment C
Calibration Certificates



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.

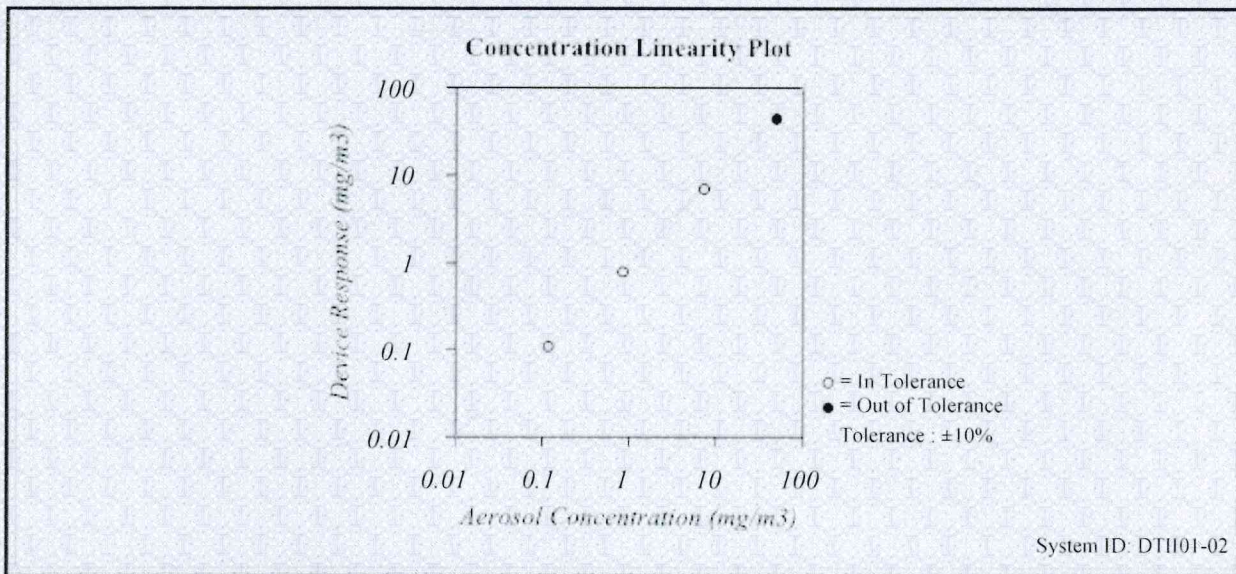


CERTIFICATE OF CALIBRATION AND TESTING

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. Greenover

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

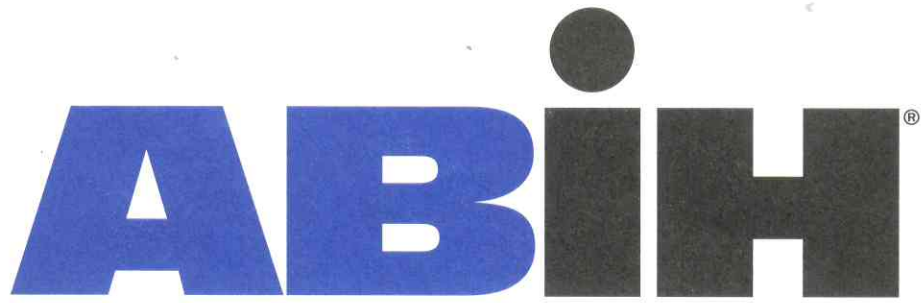
BUCK
A.P. BUCK, INC.

COCR-004 REV-01 3/3/2006



Attachment D

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

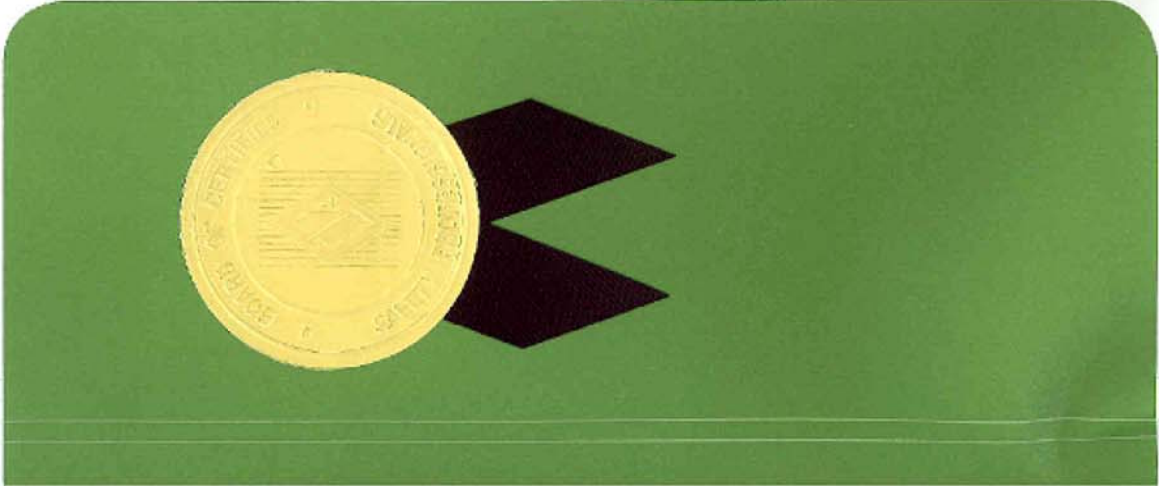
CIH

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





Attachment E

Floor Plan with Sampling Locations

