

Accredited Environmental Technologies, Inc.

HVAC DUCT CLEANING (AHU 7 and AHU 8) REPORT

**Mars Elementary School (B and C Wings)
549 PA 228
Mars, Pennsylvania 16046**

**Testing Conducted by: Accredited Environmental Technologies, Inc.
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President**

**Client: Mars Area School District
545 Route 228
Mars, PA 16046**

Management Contact: Mr. Randy Smith

AET Project No.: 11-18-PGH148ELEM

Date of Report: November 48.'423: "

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Accredited Environmental Technologies, Inc.

EXECUTIVE SUMMARY

In November 2018, Accredited Environmental Technologies, Inc. (AET) was contracted by Mars Area School District to perform Indoor Air Quality testing for airborne particulates and Mold Spore Air Quality (MSAQ) testing at Mars Area Elementary School during duct cleaning activities in the B and C Wings. Duct cleaning was performed by Air Duct Maintenance, Inc. (ADM) on Air Handling Units #7 and #8 and their associated duct work and supply/return vents. Duct cleaning was performed on a nightly work shift (4:00 p.m. to 12:00 a.m) and commenced on 10/31/18 and was completed on 11/15/18.

ADM's duct cleaning scope of services is defined in ADM's 10/22/18 letter proposal to Mars Area School District. As defined, duct cleaning activities strictly adhered to the National Air Duct Cleaners Association (NADCA) duct cleaning guidelines. Duct cleaning was performed due to ADM's observed conditions, along with indoor air odor concerns in which the HVAC system was thought responsible. ADM was solely responsible for the inspection and verified completion of duct work cleaning activities within the HVAC system. AET cannot professionally verify that the proposed duct cleaning operations will achieve the intended odor reduction results.

A brief summary listing of the duct cleaning steps utilized by ADM on a nightly basis include:

- The Air Handling Unit (AHU) was turned off.
- The AHU including the fresh air intake, filter housing, fans, coils, condensate pan, etc. were HEPA vacuumed/wet wiped clean and the filters replaced.
- During duct cleaning, access holes (1'x1') were cut into the main trunk line approximately every 25 feet.
- A foam pad was installed as a barrier inside the ductwork to isolate the specific duct work section to be cleaned.
- The duct work was cleaned using an air whip to agitate settled dust/debris inside the ductwork while venting the ductwork with a HEPA vacuum to create negative pressure and capture the dust/debris.
- Cleaning verification and documentation was performed using a three-swipe test (run vacuum over area three times) to confirm the duct work is clean. Cleaning verification was by visual inspection only; a NADCA vacuum test to meet a cleaning level below 0.75 mg/100 cm² was not performed. Photo documentation of the extent of cleanliness inside the duct was performed.
- Room supply/return diffusers were wet wiped clean.
- The isolation pad inside the duct work was removed and the access hole sealed.
- The AHU was activated.
- The rooms serviced by the specific AHU (impacted by duct cleaning) were visually inspected for surface debris and/or odors.

Note: Daily in-house janitorial services were also being performed concurrently with duct cleaning operations. Cleaning included wet wiping of desks, tables and other frequently cleaned furnishings and vacuuming of carpeted floors.

AET's scope of services were performed in accordance with AET Proposal #10206 dated 2/1/18 to document duct cleaning activities did not impact Indoor Air Quality in the school classrooms which are serviced by AHU #7 and #8 (not clearance/acceptance of ADM's cleaning activities). AET was onsite on a periodic basis (9 nightly work shifts only).

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A summary of AET's scope of services and associated project findings include:

1. Background indoor Air Quality Testing

- a. **Airborne total dust sampling (11/6/18)** was performed in six (6) representative classrooms serviced by AHU #7 and AHU #8 (3 per AHU). Total dust levels were reported as below the analytical detection limit (i.e. <0.052 mg/m³). The OSHA standard for inert/nuisance dust (including fiberglass) is 15 mg/m³. Total dust samples were collected on pre-weighed PVC filters for the entire work shift (480 minutes) and analyzed by Gravimetric Analysis per NIOSH Method 0500 in Analytics AIHA Accredited Laboratory.
- b. **Direct read particle counter measurements (11/6/18)** were taken in 23 classrooms service by AHU #7 and AHU #8. Three (3) spot check readings at the 0.3 micron setting were taken in each classroom and the average used to calculate airborne particulate levels in mg/m³. Airborne particulate levels ranged from 0.75 to 1.01 mg/m³. The highest individual particle counter measurement recorded was 1.24 mg/m³
- c. **Visual Inspection/Odors (11/6/18):** No musty/mold-like odors were noted in the 23 classrooms evaluated. Visual inspection of routinely cleaned surfaces (desks, tabletops, etc.) found no significant surface dust accumulations (housekeeping appeared adequate).

2. Project Indoor air Quality Testing (10/31/18, 11/1/18, 11/2/18, 11/8/18, 11/9/18, 11/12/18, 11/14/18)

- a. **Direct read particle counter measurements** were taken in 23 classrooms service by AHU #7 and AHU #8 during AET's periodic on-site inspections. Three (3) spot check samples continued to be collected and the average used. Airborne particulate levels ranged from 0.39 to 0.89 mg/m³. The highest individual particle counter measurement recorded was 0.92 mg/m³
- b. **Visual Inspection/Odors:** No musty/mold-like odors were noted in the 23 classrooms evaluated during AET's periodic on-site inspections. AET's on-site Inspector evaluated surfaces within the classrooms impacted by the nightly duct cleaning activities at the completion of each.

3. Final Indoor Air Quality Testing (11/15/18)

- a. **Airborne total dust sampling** was performed in six (6) representative classrooms serviced by AHU #7 and AHU #8 (3 per AHU) and compared to outdoors. Total dust levels were reported as below the analytical detection limit (i.e. <0.052 mg/m³). The OSHA standard for inert/nuisance dust (including Fiberglass) is 15 mg/m³. Total dust samples were collected on pre-weighed PVC filters for the entire work shift (480 minutes) and analyzed by Gravimetric Analysis per NIOSH Method 0500 in Analytics AIHA Accredited Laboratory. Note: The outdoor total dust concentration was measured at <0.052 mg/m³
- b. **Direct read particle counter measurements** were taken in 23 classrooms service by AHU #7 and AHU #8 (concurrent during total dust sampling). Three (3) spot check readings at the 0.3 micron setting were taken in each classroom and the average used to calculate airborne particulate levels in mg/m³. Airborne particulate levels ranged from 0.24 to 0.40 mg/m³. The highest individual particle counter measurement recorded was 0.45 mg/m³.

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- c. **Visual Inspection/Odors:** No musty/mold-like odors were noted in the 23 classrooms evaluated. Visual inspection of routinely cleaned surfaces (desks, tabletops, etc.) found no significant surface dust accumulations (housekeeping appeared adequate).
- d. **Mold spore Air quality Testing (MSAQ):** MSAQ testing was performed in ten (10) representative classrooms serviced by AHU #7 and AHU #8 (5 per AHU) and compared to outdoors. Total mold spore levels in the ten (10) interior classroom locations were below 2000 S/m³ as well as similar to outdoors. No amplification of mold spores related to active mold growth was noted. Basidiospores and Cladosporium were most prevalent and common mold spores found both indoors and outdoors. No target mold spores were found. (See Standards Section)

Total Airborne Mold Spore Concentrations (11/15/18)					
Sample#	Location	Total Concentration	Specific Mold Type		
			Basidiospores	Cladosporium	Aspergillus/ Penicillium
26898182	Room C021, Center (AHU #8)	160 S/m ³	ND	160 S/m ³	ND
26898155	Room C126, Center (AHU #8)	107 S/m ³	ND	107 S/m ³	ND
26898163	Room B116, Center (AHU #8)	213 S/m ³	ND	213 S/m ³	ND
26898154	Room C017, Center (AHU #8)	53 S/m ³	53 S/m ³	ND	ND
26898173	Room B014, Center (AHU #8)	53 S/m ³	53 S/m ³	ND	ND
26898137	Room B016, Center (AHU #7)	160 S/m ³	ND	160 S/m ³	ND
26898151	Room C019, Center (AHU #7)	213 S/m ³	ND	213 S/m ³	ND
26898156	Room C012, Center (AHU #7)	ND	ND	ND	ND
26898181	Room B010, Center (AHU #7)	267 S/m ³	ND	267 S/m ³	ND
26898150	Room C013, Center (AHU #7)	107 S/m ³	107 S/m ³	ND	ND
26898211	Outdoors: Adjacent to Main Entrance	107 S/m ³	107 S/m ³	ND	ND

No target molds (Stachybotrys, Chaetomium, Trichoderma, and Fusarium) detected

Conclusion: HVAC cleaning activities associated with AHU #7 and AHU #8 were completed as certified by Air Duct Maintenance, Incorporated. No airborne particulate or mold spore impact was noted to the school rooms serviced by the air handling units during work. No odors were reported to the school rooms serviced by the AHUs during and after nightly work shifts. Surface dust conditions within the school rooms serviced by the AHUs (housekeeping) appears adequate.

Final airborne particulate/dust levels following duct cleaning were similar to outdoors. Final airborne particle counter measurements following duct cleaning were reduced from the initial background indoor air quality testing.

This executive summary does not contain all of the information that is detailed in the full report. The report should be read in its entirety, including any tabular findings and appendices to obtain a more complete understanding of the information provided, and to aid in any decisions made, or actions taken, based on this information.

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STANDARDS

HVAC System Cleaning

There are no Federal (OSHA/EPA) or State of Pennsylvania regulatory standards for duct cleaning. General minimal requirements (Guidelines) for HVAC cleaning have been established by the National Air Duct Cleaners Association (NADCA) to render HVAC components clean and to verify their cleanliness through inspection and/or testing per applicable NADCA standards. NADCA ACR-2013 Standard (Assessment, Cleaning and Restoration of HVAC systems) requires HVAC contractors to be members of NADCA and to employ/utilize Air System Cleaning Specialists certified by NADCA and follow NADCA General Specifications for HVAC cleaning. Section 5 – Cleanliness, Verification and Documentation of the ACR-2013 describes Method 1-Visual Inspection Criteria to verify HVAC systems are visibly clean and require no further cleaning methods.

OSHA (Total Inert/Nuisance Dust)

The OSHA Permissible Exposure Limit (PEL) for total airborne nuisance dust (including fiberglass) is found in 29 CFR 1910.1000 Table Z3 is 15.0 ug/m³.

Mold

There are no Federal (OSHA/EPA) or State of Pennsylvania regulatory standards for mold. Mold in both the residential and occupational settings do not comprise a single entity but generally a complex mixture of many different fungi, bacteria, etc. Human response can vary significantly based on wide variations in individual susceptibility. Health effects information regarding mold is generally insufficient to describe exposure-response relationships. The prudent approach for mold within buildings is to repair sources of water infiltration or elevated humidity and remediate areas of mold growth and maintain airborne mold spore levels as low as can be reasonably achieved. All allergy or medical related questions and concerns, including health concerns related to possible mold exposure, should be directed to a qualified physician.

Standards of care (recommended guidelines) have been developed and published by OSHA, EPA, American Conference of Governmental Industrial Hygienists (ACGIH), and the National Organization of Remediators and Mold Inspectors (NORMI) pertaining to mold assessments, controls, remediation, prevention, work practices, and post remediation validation in the indoor environment. The ACGIH recommended approach to assessing and controlling mold exposures relies on visual inspection, assessing occupant symptoms, evaluating building performance, monitoring potential environmental sources and application of professional judgement. Standard industry practice for MSAQ compares airborne mold concentrations in the area(s) of concern to outdoor levels as well as indoor non-concern or comparative locations. Both the total airborne mold spore levels and specific mold species in each sample is reviewed on a comparative basis. Surface staining or suspect mold growth is evaluated by bulk, swab or tape lift sampling.

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NORMI standard of care for interpretation of sampling data for mold assessments is listed below. These standard industry practices have been incorporated into AET's services described herein.

NORMI Standard of Care Guidelines for Mold Assessment Samples			
Sample Type	Result /m ³	NORMI Interpretation	Notes
Airborne Mold Spore (non-viable)	Total Spore Count	<2000 Normal	Other molds may be found that have significance in some environments such as Cladosporium, which can be found as indoor sources and can be prevalent outdoors.
	Aspergillus/Penicillium	<200 Normal	
	Target Molds (Stachybotrys, Chaetomium, Trichoderma, Fusarium, Memnoniella)	No Target Molds	
Surface Mold by Tape or Swab (non-viable)	1-10 spores (~1+)	Rare	Normal
	11-100 spores (~2+)	Low	Caution
	101-1000 spores (~3+/4+)	Medium	Contamination Probable
	>1000 spores (~5+)	High	High Contamination

Please consult with the EPA document Mold Remediation in Schools and Commercial Buildings for information regarding prevention, investigating, evaluating, and remediation of mold problems.

Resource information/guidance/interpretation of mold testing results can be found at the following websites.

- www.cdc.gov
- www.osha.gov
- www.aiha.org
- www.epa.gov

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RESTRICTIONS/LIMITATIONS OF SERVICES

General: AET's scope of services were performed in accordance with AET Proposal #10206 dated 2/1/18 to document duct cleaning activities did not impact Indoor Air Quality in the school classrooms which are serviced by AHU #7 and #8 (not clearance/acceptance of ADM's cleaning activities). AET was onsite on a periodic basis (9 nightly work shifts only).

ADM's duct cleaning scope of services is defined in ADM's 10/22/18 letter proposal to Mars Area School District. As defined, duct cleaning activities strictly adhered to the National Air Duct Cleaners Association (NADCA) duct cleaning guidelines. Duct cleaning was performed due to ADM's observed conditions, along with indoor air odor concerns in which the HVAC system was thought responsible. ADM was solely responsible for the inspection and verified completion of duct work cleaning activities within the HVAC system. AET cannot professionally verify that the proposed duct cleaning operations will achieve the intended odor reduction results.

Warranty: AET's services were performed in a manner consistent with the level of skill and standard industry practices exhibited by members of the indoor air quality consulting profession. No other representations or warranties, expressed or implied, are included in connection with this report due to the restrictions/limitations detailed herein. AET's services were performed in accordance with the project intent identified in AET's proposal and subject to AET's terms and conditions dated April 2018. AET's findings/conclusions are not intended to be all inclusive; conditions which were not permitted, were undocumented, not observed or otherwise concealed on the subject property could exist (which may result in a modification of our conclusions or recommendations presented). The conclusion portion of this report is not intended to identify all areas of the structure which may have exposed or concealed mold contamination. Further, many IAQ sources can exist at the site (investigation of which is not part of AET's scope of services). Liability on the part of AET is limited to the monetary value paid for this report.

TOTAL INERT/NUISANCE DUST SAMPLE ANALYSIS REPORT

CLIENT: MARS AREA SCHOOL DISTRICT

AET PROJECT #: 11-18-PGH148

LOCATION: MARS ELEMENTARY SCHOOL
549 PA 228
MARS, PENNSYLVANIA

SAMPLING METHOD: NIOSH 0500

ACTIVITY: BACKGROUND SAMPLING

Sample#	Date	Time (min)/ Volume (L)	Location	Total Dust Level (mg/m ³)
PGH148-01-11-6-18	11/6/18	480/960	Room C021, Center	<0.052
PGH148-02-11-6-18	11/6/18	480/960	Room C126, Center	<0.052
PGH148-03-11-6-18	11/6/18	480/960	Room B116, Center	<0.052
PGH148-04-11-6-18	11/6/18	480/960	Room B016, Center	<0.052
PGH148-05-11-6-18	11/6/18	480/960	Room C019, Center	<0.052
PGH148-06-11-6-18	11/6/18	480/960	Room C012, Center	<0.052

ACTIVITY: FINAL SAMPLING

Sample#	Date	Time (min)/ Volume (L)	Location	Total Dust Level (mg/m ³)
PGH148-01-11-15-18	11/15/18	480/960	Boiler Room, Exterior Entrance, Outdoor	<0.052
PGH148-01-11-15-18	11/15/18	480/960	Room C021, Center	<0.052
PGH148-02-11-15-18	11/15/18	480/960	Room C126, Center	<0.052
PGH148-03-11-15-18	11/15/18	480/960	Room B116, Center	<0.052
PGH148-04-11-15-18	11/15/18	480/960	Room B016, Center	<0.052
PGH148-05-11-15-18	11/15/18	480/960	Room C019, Center	<0.052
PGH148-06-11-15-18	11/15/18	480/960	Room C012, Center	<0.052

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BACKGROUND SPOT CHECK AIRBORNE PARTICULATE MEASUREMENTS

MARS ELEMENTARY SCHOOL DUCT CLEANING B&C WINGS

LOCATION: AIR HANDLING UNIT 7 (13 ROOMS)

DATE: 11/6/18

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B010	461602	692181	530370	561384	0.56
B011	411939	424170	426600	420903	0.42
B012	1153746	479511	431870	701709	0.70
B013	1083150	415950	432040	499700	0.50
B015	452061	402120	425790	426658	0.43
B016	440811	406710	438390	428637	0.43
B017	408267	314550	351990	368269	0.37
C011	941220	529830	561100	677383	0.68
C012	896544	354150	443916	564870	0.56
C013	767493	459270	455160	560641	0.56
C016	324090	453780	430290	402720	0.40
C018	1118916	485190	515880	706662	0.70
C019	1149498	459270	503640	704136	0.70

LOCATION: AIR HANDLING UNIT 8 (10 ROOMS)

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B014	427761	534033	509400	490398	0.49
B116	377469	500265	376340	418024	0.42
C014	927864	524880	493950	648898	0.65
C015	723987	425610	382860	510814	0.51
C017	386676	396045	357930	380217	0.38
C021	584640	353610	333090	423780	0.42
C122	480004	572868	348400	452091	0.45
C124	415600	450963	301950	389504	0.39
C126	462321	366831	333180	387444	0.39
C128	451800	432648	312210	398886	0.40

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PERIODIC SPOT CHECK AIRBORNE PARTICULATE MEASUREMENTS

MARS ELEMENTARY SCHOOL DUCT CLEANING B&C WINGS

LOCATION: AIR HANDLING UNIT 7 (13 ROOMS)

DATE: 11/8/18

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B010	1168110	605790	942470	905457	0.91
B011	1164870	514450	821250	833523	0.83
B012	1053000	579800	890280	841027	0.84
B013	1230030	593610	913490	912377	0.91
B015	1004850	643590	926400	858280	0.86
B016	1240920	892250	902880	1012017	1.01
B017	1238400	769440	907380	971740	0.97
C011	873900	540220	927360	780493	0.78
C012	930510	556030	941400	809580	0.81
C013	831960	628440	797300	753567	0.75
C016	851320	694920	855090	800443	0.80
C018	953820	572450	859960	7934410	0.80
C019	1230840	777290	901290	969807	0.97

LOCATION: AIR HANDLING UNIT 8 (10 ROOMS)

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B014	1319400	602470	893570	938480	0.94
B116	664660	807210	898470	790113	0.79
C014	903240	583740	930420	805800	0.81
C015	920160	508230	932490	786960	0.79
C017	843030	632950	802470	779500	0.78
C021	1084050	500100	809370	797840	0.80
C122	781850	940410	954180	892147	0.89
C124	778760	708310	997110	828127	0.83
C126	850050	692470	943700	828740	0.83
C128	844470	640390	932240	805700	0.81

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PERIODIC SPOT CHECK AIRBORNE PARTICULATE MEASUREMENTS

MARS ELEMENTARY SCHOOL DUCT CLEANING B&C WINGS

LOCATION: AIR HANDLING UNIT 7 (13 ROOMS)

DATE: 11/9/18

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B010	251640	850500	800190	634116	0.63
B011	248940	893790	750780	611700	0.63
B012	355230	810000	801100	655433	0.66
B013	349200	984060	769650	700970	0.70
B015	195230	782370	670410	349337	0.53
B016	251640	852870	744210	616240	0.62
B017	218430	873360	736350	609513	0.61
C011	248670	1035090	967140	750300	0.75
C012	195930	815220	805860	605670	0.61
C013	209330	723870	674830	536010	0.54
C016	180990	717120	632610	510240	0.51
C018	207450	929700	763740	633630	0.63
C019	234000	919970	820894	654956	0.60

LOCATION: AIR HANDLING UNIT 8 (10 ROOMS)

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B014	254970	871200	856030	660750	0.66
B116	190980	460800	520470	390750	0.39
C014	243430	830970	670230	582210	0.58
C015	260370	890100	796680	649050	0.65
C017	203040	804060	602260	336453	0.54
C021	257220	784980	669060	570420	0.57
C122	294840	550930	550350	465373	0.47
C124	303930	610020	558450	490800	0.49
C126	264600	606500	750780	540327	0.54
C128	262890	624140	622350	303127	0.50

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PERIODIC SPOT CHECK AIRBORNE PARTICULATE MEASUREMENTS

MARS ELEMENTARY SCHOOL DUCT CLEANING B&C WINGS

LOCATION: AIR HANDLING UNIT 7 (13 ROOMS)

DATE: 11/12/18

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B010	375080	990060	908670	891270	0.89
B011	717480	827839	844640	796670	0.80
B012	741120	755180	759020	751773	0.75
B013	739710	80350	855180	799463	0.80
B015	732960	731750	831580	765430	0.77
B016	723870	804280	842470	790140	0.79
B017	748440	741910	831930	774093	0.77
C011	720540	741950	750930	737807	0.74
C012	733590	843370	836000	804320	0.80
C013	771300	633030	699570	709390	0.70
C016	658350	710890	743100	704147	0.70
C018	683460	843870	744830	757373	0.76
C019	703440	922590	891310	839113	0.84

LOCATION: AIR HANDLING UNIT 8 (10 ROOMS)

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B014	742770	733040	763180	796830	0.79
B116	732310	709240	858140	766563	0.77
C014	689940	819980	794630	768183	0.77
C015	668790	826120	839870	778280	0.78
C017	669420	822730	827990	773350	0.77
C021	715400	837230	746890	766520	0.77
C122	646110	900430	899520	815353	0.82
C124	660960	872490	804270	779240	0.78
C126	680400	794570	900020	791663	0.79
C128	662400	894400	814850	790580	0.79

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PERIODIC SPOT CHECK AIRBORNE PARTICULATE MEASUREMENTS

MARS ELEMENTARY SCHOOL DUCT CLEANING B&C WINGS

LOCATION: AIR HANDLING UNIT 7 (13 ROOMS)

DATE: 11/14/18

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B010	249660	873900	900230	674597	0.67
B011	254530	821830	805540	656417	0.66
B012	247190	922120	892890	687400	0.69
B013	266140	954190	950300	723543	0.72
B015	251640	937420	862530	683863	0.68
B016	254520	894180	879680	676127	0.68
B017	254530	821520	784060	620037	0.62
C011	276480	877430	992050	715320	0.72
C012	249120	795870	959920	668303	0.67
C013	231510	652500	785430	536500	0.56
C016	249300	743760	750700	581233	0.58
C018	263090	876600	906580	682090	0.68
C019	271350	911250	900660	694420	0.69

LOCATION: AIR HANDLING UNIT 8 (10 ROOMS)

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B014	264330	833490	850670	649497	0.65
B116	233180	801540	782430	603717	0.61
C014	232560	787950	874960	631823	0.63
C015	235800	773280	755550	588210	0.59
C017	232020	752250	964200	651490	0.65
C021	738860	861270	783710	622927	0.63
C122	250560	827550	856950	645020	0.65
C124	246960	845390	799890	630740	0.63
C126	246780	898380	837790	660983	0.66
C128	259290	875050	784580	639640	0.64

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FINAL SPOT CHECK AIRBORNE PARTICULATE MEASUREMENTS

MARS ELEMENTARY SCHOOL DUCT CLEANING B&C WINGS

LOCATION: AIR HANDLING UNIT 7 (13 ROOMS)

DATE: 11/15/18

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B010	236070	356750	403110	331977	0.33
B011	233370	486540	340380	353430	0.35
B012	243540	366840	366210	325530	0.33
B013	392850	386550	356580	378660	0.38
B015	225350	402480	354060	327630	0.33
B016	258750	341280	390600	330310	0.33
B017	215300	330300	333720	293040	0.29
C011	433870	440190	309240	401100	0.40
C012	483770	370980	295110	361620	0.36
C013	410760	440910	298080	393520	0.38
C016	217980	446490	296190	318220	0.37
C018	398610	417870	304200	373560	0.37
C019	419910	444960	292490	385787	0.39

LOCATION: AIR HANDLING UNIT 8 (10 ROOMS)

ROOM	0.3 Micron Reading	0.3 Micron Reading	0.3 Micron Reading	Average	Mg/m3
B014	209960	341370	317070	289467	0.29
B116	178290	264130	275940	239460	0.34
C014	279540	333540	275850	296310	0.30
C015	303020	332280	283050	306117	0.31
C017	248760	327420	284670	286930	0.29
C021	219870	2993530	274680	264633	0.26
C122	251230	344520	281790	292680	0.29
C124	258660	337950	275050	290553	0.29
C126	261900	371790	305190	312960	0.31
C128	264420	355680	275940	298680	0.30

Accredited Environmental Technologies, Inc.

AIRBORNE FUNGAL SPORE ANALYSIS REPORT

CLIENT: MARS AREA SCHOOL DISTRICT

AET PROJECT #: 11-18-PGH148

LOCATION: MARS ELEMENTARY SCHOOL
549 MARS ROAD
MARS, PENNSYLVANIA 16046

DATE COLLECTED: 11/15/18

DATE ANALYZED: 11/19/18

FUNGAL SPORES BY OPTICAL MICROSCOPY									
Sample #	2689-8182			2689-8155			2689-8163		
Location	Room C021 Center (AHU#8)			Room C126 Center (AHU#8)			Room B116 Center (AHU#8)		
Volume (Liters)	75			75			75		
Non-Spore Loading									
Background Debris	2+			2+			2+		
Hyphal Fragments	ND			ND			ND		
Pollen	ND			ND			ND		
Presumptive Spore Types	Count	%	S/m³	Count	%	S/m³	Count	%	S/m³
Alternaria	-	-	-	-	-	-	-	-	-
Arthrinium	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	-	-	-	-	-	-	-	-	-
Bipolaris/Drechslera	-	-	-	-	-	-	-	-	-
Botrytis	-	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	12	100	160	8	100	107	16	100	213
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Fusicladium	-	-	-	-	-	-	-	-	-
Geotrichum	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Oidium/Erysiphe	-	-	-	-	-	-	-	-	-
Pestilotia	-	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	-	-	-	-	-
Smuts/Periconia/Myxomycetes	-	-	-	-	-	-	-	-	-
Spegazzinia	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Stemphylium	-	-	-	-	-	-	-	-	-
Tetraploa	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Trichoderma	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unknown/other	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Zygothia	-	-	-	-	-	-	-	-	-
TOTAL FUNGAL SPORES	12	-	160	8	-	107	16	-	213



Kelly Eckhart, Laboratory Analyst

Background Debris Rating Scale:

ND = None Detected, 1+ = Minimal, 2+ = Up to 25%, 3+ = >25% to 50%, 4+ = >50% to 75%, 5+ = >75%

Accredited Environmental Technologies, Inc.

AIRBORNE FUNGAL SPORE ANALYSIS REPORT

CLIENT: MARS AREA SCHOOL DISTRICT

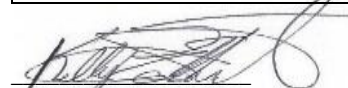
AET PROJECT #: 11-18-PGH148

LOCATION: MARS ELEMENTARY SCHOOL
549 MARS ROAD
MARS, PENNSYLVANIA 16046

DATE COLLECTED: 11/15/18

DATE ANALYZED: 11/19/18

FUNGAL SPORES BY OPTICAL MICROSCOPY									
Sample #	2689-8154			2689-8173			2689-8137		
Location	Room C017 Center (AHU#8)			Room B014 Center (AHU#8)			Room B016 Center (AHU#7)		
Volume (Liters)	75			75			75		
Non-Spore Loading									
Background Debris	2+			2+			2+		
Hyphal Fragments	ND			ND			4		
Pollen	ND			ND			ND		
Presumptive Spore Types	Count	%	S/m³	Count	%	S/m³	Count	%	S/m³
Alternaria	-	-	-	-	-	-	-	-	-
Arthrinium	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	4	100	53	4	100	53	-	-	-
Bipolaris/Drechslera	-	-	-	-	-	-	-	-	-
Botrytis	-	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	12	100	160
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Fusicladium	-	-	-	-	-	-	-	-	-
Geotrichum	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Oidium/Erysiphe	-	-	-	-	-	-	-	-	-
Pestilotia	-	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	-	-	-	-	-
Smuts/Periconia/Myxomycetes	-	-	-	-	-	-	-	-	-
Spegazzinia	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Stemphylium	-	-	-	-	-	-	-	-	-
Tetraploa	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Trichoderma	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unknown/other	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Zygophiala	-	-	-	-	-	-	-	-	-
TOTAL FUNGAL SPORES	4	-	53	4	-	53	12	-	160


Kelly Eckhart, Laboratory Analyst

Background Debris Rating Scale:

ND = None Detected, 1+ = Minimal, 2+ = Up to 25%, 3+ = >25% to 50%, 4+ = >50% to 75%, 5+ = >75%

Accredited Environmental Technologies, Inc.

AIRBORNE FUNGAL SPORE ANALYSIS REPORT

CLIENT: MARS AREA SCHOOL DISTRICT


AET PROJECT #: 11-18-PGH148

LOCATION: MARS ELEMENTARY SCHOOL
549 MARS ROAD
MARS, PENNSYLVANIA 16046

DATE COLLECTED: 11/15/18

DATE ANALYZED: 11/19/18

FUNGAL SPORES BY OPTICAL MICROSCOPY									
Sample #	2689-8151			2689-8156			2689-8181		
Location	Room C019 Center (AHU#7)			Room C012 Center (AHU#7)			Room B010 Center (AHU#7)		
Volume (Liters)	75			75			75		
Non-Spore Loading									
Background Debris	3+			3+			3+		
Hyphal Fragments	ND			ND			4		
Pollen	ND			ND			ND		
Presumptive Spore Types	Count	%	S/m³	Count	%	S/m³	Count	%	S/m³
Alternaria	-	-	-	-	-	-	-	-	-
Arthrinium	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	-	-	-	-	-	-	-	-	-
Bipolaris/Drechslera	-	-	-	-	-	-	-	-	-
Botrytis	-	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	16	100	213	-	-	-	20	100	267
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Fusicladium	-	-	-	-	-	-	-	-	-
Geotrichum	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Oidium/Erysiphe	-	-	-	-	-	-	-	-	-
Pestilotia	-	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	-	-	-	-	-
Smuts/Periconia/Myxomycetes	-	-	-	-	-	-	-	-	-
Spegazzinia	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Stemphylium	-	-	-	-	-	-	-	-	-
Tetraploa	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Trichoderma	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unknown/other	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Zygophiala	-	-	-	-	-	-	-	-	-
TOTAL FUNGAL SPORES	16	-	213	0	-	<53	20	-	267


Kelly Eckhart, Laboratory Analyst

Background Debris Rating Scale:

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Accredited Environmental Technologies, Inc.

AIRBORNE FUNGAL SPORE ANALYSIS REPORT

CLIENT: MARS AREA SCHOOL DISTRICT


AET PROJECT #: 11-18-PGH148

LOCATION: MARS ELEMENTARY SCHOOL
549 MARS ROAD
MARS, PENNSYLVANIA 16046

DATE COLLECTED: 11/15/18

DATE ANALYZED: 11/19/18

FUNGAL SPORES BY OPTICAL MICROSCOPY									
Sample #	2689-8150			2689-8211			-		
Location	Room C013 Center (AHU#7)			Outdoors Adjacent to Main Entrance			-		
Volume (Liters)	75			75			-		
Non-Spore Loading									
Background Debris	2+			2+			-		
Hyphal Fragments	ND			ND			-		
Pollen	ND			ND			-		
Presumptive Spore Types	Count	%	S/m ³	Count	%	S/m ³	Count	%	S/m ³
Alternaria	-	-	-	-	-	-	-	-	-
Arthrinium	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-	-	-
Basidiospores	-	-	-	-	-	-	-	-	-
Bipolaris/Drechslera	8	100	107	8	100	107	-	-	-
Botrytis	-	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Fusicladium	-	-	-	-	-	-	-	-	-
Geotrichum	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Oidium/Erysiphe	-	-	-	-	-	-	-	-	-
Pestilotia	-	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Rusts	-	-	-	-	-	-	-	-	-
Smuts/Periconia/Myxomycetes	-	-	-	-	-	-	-	-	-
Spegazzinia	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Stemphylium	-	-	-	-	-	-	-	-	-
Tetraploa	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Trichoderma	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unknown/other	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Zygophiala	-	-	-	-	-	-	-	-	-
TOTAL FUNGAL SPORES	8	-	107	8	-	107	-	-	-


Kelly Eckhart, Laboratory Analyst

Background Debris Rating Scale:

ND = None Detected, 1+ = Minimal, 2+ = Up to 25%, 3+ = >25% to 50%, 4+ = >50% to 75%, 5+ = >75%



Analytics Corporation
10329 Stony Run Lane
Ashland, Va 23005
Phone: (804) 365-3000 Fax: (804) 365-3002
AIHA-LAP, LLC Accreditation ID 100531

November 13, 2018

LOU PERGOLA
AET INC - CHARLEROI
128 STATE STREET
CHARLEROI, PA 15022

Laboratory Workorder ID: W313068

Client Project ID: PGH148

Received: November 9, 2018

Reported: November 13, 2018

Attached are the results we obtained on the analysis of your samples submitted to Analytics. Any Chains-of-Custody associated by this sample group are enclosed. Air concentrations are calculated as a convenience to the client and the overall accuracy of this result depends on both the accuracy of the air volume and the amount found by analysis. Theoretical air volumes for passive monitors are calculated using the sampling time submitted and the manufacture's listed sampling rate for each compound. Results provided in this report relate only to the items tested.

For blanks and non-detects the results indicated with a '<' value represents the reporting limit for the analysis. Unless otherwise noted results are not corrected for blank values.

Unless the signature of the appropriate manager(s) appears on this report, this report should be considered PRELIMINARY and is subject to change.

We appreciate your confidence in allowing Analytics to be your testing laboratory. Any questions regarding this report can be addressed by calling our customer services department at (800) 888-8061.

A handwritten signature in black ink that reads "Andrew L. Teague". The signature is written in a cursive, flowing style.

Andrew L. Teague, CIH
Technical Director

Enclosures



Final Report

Work Order W313068

AET INC - CHARLEROI
128 STATE STREET
CHARLEROI, PA 15022

Customer: PSC00035
Attention: LOU PERGOLA
PO Number PGH148

Date Received: 11/09/18
Client Project ID PGH148

Lab ID: W313068001 Sample ID: PGH148-01-11-6-18 Media: 5um Preweighed PVC Filter Sample Date: 11/6/2018 Sampling Time:

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/12/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3

Lab ID: W313068002 Sample ID: PGH148-02-11-6-18 Media: 5um Preweighed PVC Filter Sample Date: 11/6/2018 Sampling Time:

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/12/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3

Lab ID: W313068003 Sample ID: PGH148-03-11-6-18 Media: 5um Preweighed PVC Filter Sample Date: 11/6/2018 Sampling Time:

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/12/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3

Lab ID: W313068004 Sample ID: PGH148-04-11-6-18 Media: 5um Preweighed PVC Filter Sample Date: 11/6/2018 Sampling Time:

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
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Final Report

Work Order W313068

Lab ID: W313068004	Sample ID: PGH148-04-11-6-18	Media: 5um Preweighed PVC Filter	Sample Date: 11/6/2018	Sampling Time:
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Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/12/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3

Lab ID: W313068005	Sample ID: PGH148-05-11-6-18	Media: 5um Preweighed PVC Filter	Sample Date: 11/6/2018	Sampling Time:
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Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/12/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3

Lab ID: W313068006	Sample ID: PGH148-06-11-6-18	Media: 5um Preweighed PVC Filter	Sample Date: 11/6/2018	Sampling Time:
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Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/12/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3



Analytics Corporation
10329 Stony Run Lane
Ashland, Va 23005
Phone: (804) 365-3000 Fax: (804) 365-3002
AIHA-LAP, LLC Accreditation ID 100531

Final Report

Work Order W313068

General Laboratory Comments

Abbreviations:

ug = micrograms; mg=milligrams; g = grams, ppm=parts per million (volume), ppb = parts per billion (volume), mg/M3=milligrams per cubic meter of air, ug/M3=micrograms per cubic meter of air; Min=minutes, Qual=Qualifiers



Analytics Corporation
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Ashland, Va 23005
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AIHA-LAP, LLC Accreditation ID 100531

November 23, 2018

LOU PERGOLA
AET INC - CHARLEROI
128 STATE STREET
CHARLEROI, PA 15022

Laboratory Workorder ID: W323025

Client Project ID: PGH148

Received: November 19, 2018

Reported: November 23, 2018

Attached are the results we obtained on the analysis of your samples submitted to Analytics. Any Chains-of-Custody associated by this sample group are enclosed. Air concentrations are calculated as a convenience to the client and the overall accuracy of this result depends on both the accuracy of the air volume and the amount found by analysis. Theoretical air volumes for passive monitors are calculated using the sampling time submitted and the manufacture's listed sampling rate for each compound. Results provided in this report relate only to the items tested.

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A handwritten signature in black ink that reads "Andrew L. Teague". The signature is written in a cursive, flowing style.

Andrew L. Teague, CIH
Technical Director

Enclosures



Final Report

Work Order W323025

AET INC - CHARLEROI
128 STATE STREET
CHARLEROI, PA 15022

Customer: PSC00035
Attention: LOU PERGOLA
PO Number PGH148

Date Received: 11/19/18
Client Project ID PGH148

Lab ID: W323025001 Sample ID: PGH148 11-15-01 Media: 5um Preweighed PVC Filter Sample Date: 11/15/2018 Sampling Time:

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/21/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3

Lab ID: W323025002 Sample ID: PGH148 11-15-02 Media: 5um Preweighed PVC Filter Sample Date: 11/15/2018 Sampling Time:

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/21/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3

Lab ID: W323025003 Sample ID: PGH148 11-15-03 Media: 5um Preweighed PVC Filter Sample Date: 11/15/2018 Sampling Time:

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/21/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3

Lab ID: W323025004 Sample ID: PGH148 11-15-04 Media: 5um Preweighed PVC Filter Sample Date: 11/15/2018 Sampling Time:

Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/21/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3



Final Report

Work Order W323025

Lab ID: W323025005	Sample ID: PGH148 11-15-05	Media: 5um Preweighed PVC Filter	Sample Date: 11/15/2018	Sampling Time:
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Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/21/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3

Lab ID: W323025006	Sample ID: PGH148 11-15-06	Media: 5um Preweighed PVC Filter	Sample Date: 11/15/2018	Sampling Time:
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Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/21/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3

Lab ID: W323025007	Sample ID: PGH148 11-15-07	Media: 5um Preweighed PVC Filter	Sample Date: 11/15/2018	Sampling Time:
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Analyte	Method	Analysis Date	Volume	Reporting Limit	Front	Rear	Total	Concentration
Total Dust	NIOSH 0500	11/21/18	960 L	.05 mg			< 0.05 mg	< 0.052 mg/M3



Analytics Corporation
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Final Report

Work Order W323025

General Laboratory Comments

Abbreviations:

ug = micrograms; mg=milligrams; g = grams, ppm=parts per million (volume), ppb = parts per billion (volume), mg/M3=milligrams per cubic meter of air, ug/M3=micrograms per cubic meter of air; Min=minutes, Qual=Qualifiers